S_theory © (electromagnetic model of the universe)

The fourth physics © (the physics of space)

(2nd edition, release 2.2. of December 31, 2017)

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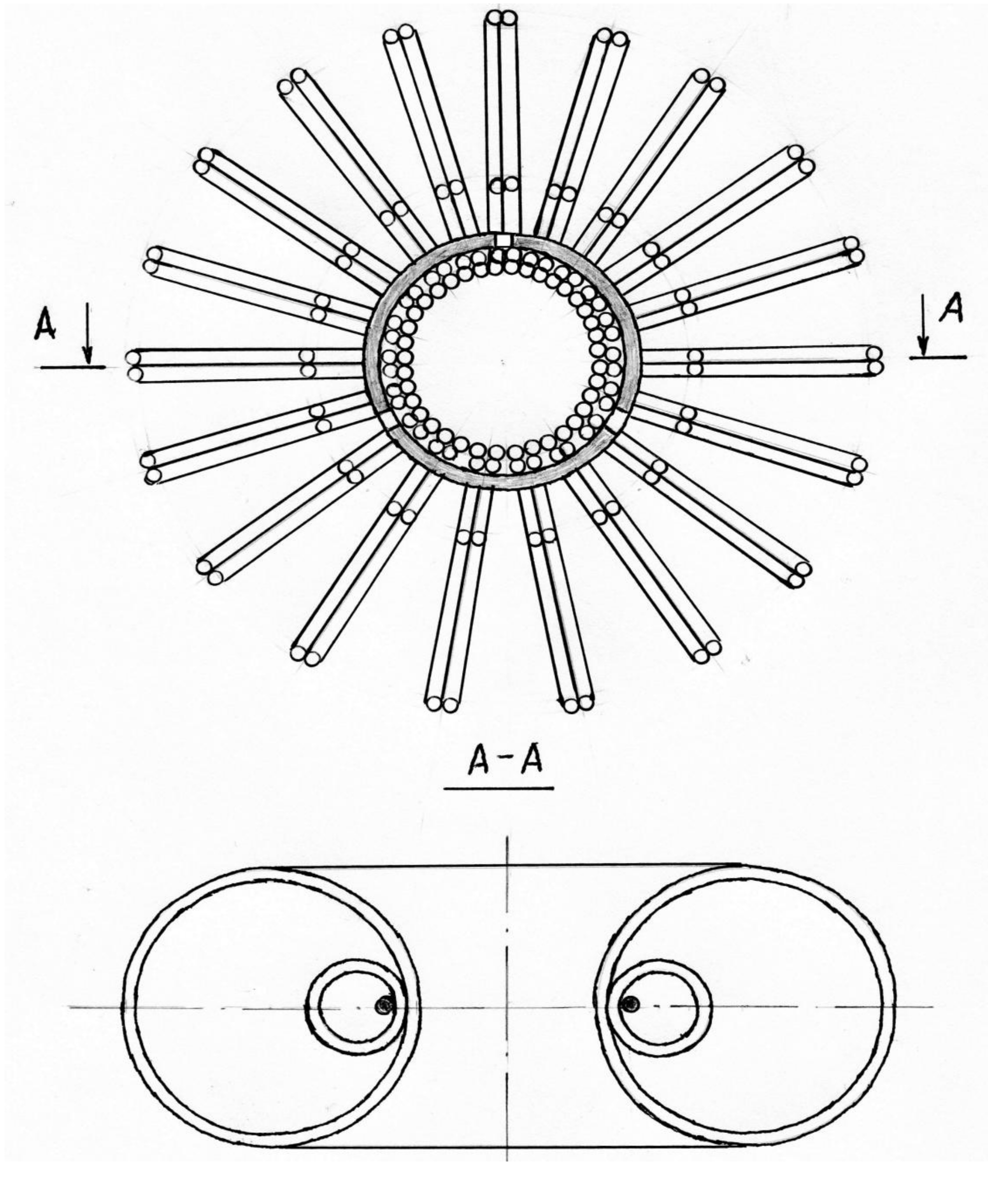

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Foreword to the 2nd edition of ST and 4F (v2.2 dated Dec. 31, 2017)

The first edition of S_theory and Fourth Physics was completed in June 2017. Five months passed. Preparation of the second edition was related to the following reasons:

1. The need to respond to comments received on the results of the discussion of the 1st edition. At the same time, two significant amendments were made concerning:

a) S_ of the Black Holes model;

b) carriers of interaction in the Unified vortex field theory.

Separate regulations and wording were also clarified, which more fully disclosed certain provisions of the work. Also, the found spelling and syntax errors were corrected and the formulations of individual paragraphs were improved without changing their meaningful meaning.

2. In recent months, a lot of papers have appeared (especially in the field of astrophysics) with the results of new studies of black holes, neutron stars, detection of gravitational waves, etc. Most of the results obtained are in sync with the S models proposed by us, sometimes coinciding with the consequences , sometimes not coinciding. Based on the results of their comparison, we are given relevant comments.

3. One of the main premise of the second edition of S_theory is the through development of the experimental design by the formation of simple (see 2.1.1) and the definition of the technical parameters of this experiment. In general, we would very much like to bring to the physical community the need for an experimental verification of the main provisions and consequences of S_theory:

a) Experimental verification of the stretching of virtual photons into simple when the vacuum is irradiated with a powerful magnetic field (the experimental parameters are given in the text of the work).

b) Experimental verification of the formation of ball lightning when a powerful discharge of current passes through a spiraling combustion conductor (the ball lightning formation model is described in the text of the paper).

c) Experimental verification of the masses of protons, neutrons and α particles emitted by different isotopes, they should differ within 0,87% for protons; 1.01% for neutrons; 0.18% for α particles (models and calculations are given in the text of the paper).

d) Experimental verification of the mass of the isotope of tritium, it should be 3.0166477657 aem, i.e. differ from reference by 0.02% (calculations are given in the text of the work).

e) Experimental verification of the schemes of mass formation and electric charge of simple (schemes of experiments are given in the text of the work).

We believe that S_theory, in case of confirmation of its main provisions and consequences, can contribute to the solution of many topical issues of modern physics.

Below is a list of all the inserts containing the new material, including their pages. In order to save time, we did not change the numbering of figures and references to literature on the text referring to the first edition. New number figures and references to additional literature in the inserts we made were assigned to subsequent issues. As a result, the through increasing numbering of figures and references to literature was violated. We hope readers will forgive us for this.

List of inserts and changes in the 2nd edition of S_theory and Fourth Physics

1. The preface to the first edition of the work is highlighted (page 12).

2. Chapter 1. (Simple)

2.1. Variants of search for particles in accelerators and "in a vacuum" (p. 14).

2.1.1. Scheme of experiment on the formation of simple (pp. 14, 35, 354, 384).

2.2. S_ model of ball lightning (edition ST2), (page 17).

2.3. Fundamentals of the theory of electromagnetic vortices (TEMV), (pp. 32, 330, 341, 376).

2.3.1. A list of the provisions and postulates of TEMV (page 33).

2.3.2. Explanations to the model of the formation of simple on TEMV (p. 34).
3. Chapter 2. (S_models of particles):
3.1. Notes on the problem of solar neutrino oscillations (p. 72).
4. Chapter 3. (Simple parameter calculation):
4.1. Influence of the new proton size on the calculations and conclusions of the S_theory (p. 84).
5. Chapter 10. (S-models of the Black Hole, analysis of the results of new studies of black holes):
5.1. S_Models of formation and structure of the Black Hole, analysis of options (page 313).
5.2. Calculating the parameters of the minimum BH (page 321).
5.3. The span of the object through the BH's bagel (page 325).
5.4. S_model of jets and magnetic field of BH (page 323).
5.5. Quasar extinction (page 325).
5.6. Risks of BH formation in experiments (p. 326).
6. Chapter 11. (Unified Vortex Field Theory):
6.1. Electromagnetic interaction in S_theory, revised edition. (page 330).
6.2. Gravitation of real photons (p. 336).
6.3. Gravity of Black Holes (p. 337).
6.4. Gravitation of Neutron Stars (p. 338).
6.5. S_Model of Gravitational Waves (p. 338).
6.6. Correlation of the Unified vortex field theory with classical electrodynamics and quantum electrodynamics (p. 341)
7. Chapter 12. (Dark matter):
71. Why does not dark matter interact with photons (page 357).
7.2. Separate remarks on the calculation of Dark Matter in the 1st ed. ST (page 357).
8. Chapter 14. Generalized RESULTS of the S_theory (ST2), (p. 361).
9. Chapter 15 "The Fourth Physics":
9.1. Determine the nature of the objects that make up space (page 369).
9.2. Variants of origin of a two-component space (2CS), (p. 372).
9.3. Corpuscular-vortex model of VP stretching in simples in 2CS, (p. 375).
9.4. TEMV - Unified corpuscular-vortex field theory from the 2CS positions, (p. 376).
9.5. Corpuscular-vortex model of the virtual photon (VP) and real photon (RP) in 2CS, (p. 376).
9.5.1. The speed of formation of chain corpuscle two-component space (C2CS) and spread of the RP, (p. 377,384).
9.5.2. Impulse of the RP, options for transferring momentum between the RP vortexes, (p. 378).
9.5.3. The minimum and maximum wavelength of the RP, (p. 379).
9.5.4. The lifetime of the RP (p. 382).
9.6. Electromagnetic and gravitational interaction in 2CS (p. 383).
9.6.1. Limiting distance of propagation of electromagnetic (and gravitational) interaction (page 384).
9.6.2. The speed of electromagnetic (and gravitational) interaction, (p. 384).
9.7. Balance and the law of conservation of energy in ST and 4P (page 385).
9.8. To be or not to be (page 387).
10. Conclusion. A brief summary (page 390).

Preface to S_theory and Fourth Physics (red. 1 of July 23, 2017)

The S_ theory proposed to your attention belongs to the class of prion models of the structure of matter.

In this paper, we propose physical models of the formation process and the internal structure of the simple first-brick of matter - simple, of which the elementary particles of the Standard Model are composed, and the composition of their physical properties (Chapter 1).

Based on the physical properties of the simple, it is shown how the spectrum of the basic elementary particles that we know, could be formed from them, the S models of their internal structure from simple, S_models of their formation processes (tau and mu-neutrinos, quarks, relict neutron, proton, electron, electron-antineutrinos). Based on S_models of particles and their reference parameters, the calculation of the parameters of simple (Chapters 2, 3) is carried out.

The proposed physical models of the internal structure of elementary particles allow us to analyze, at a new level, known nuclear reactions, beginning with nucleosynthesis reactions and ending with "modern" nuclear reactions (Chapters 4, 5, 6, 10). In this case, certain regularities are revealed, on the basis of which a theoretical S-model of nucleosynthesis reactions is constructed, which provides the deterministic result of the formation of the spectrum (cloud) of isotopes (Chapters 7, 8, 9).

A new physical approach to the process of birth and subsequent electromagnetic conglomeration of first-brick of matter - simple, into basic elementary particles allows us to approach the construction of the Single vortex field theory, including gravitational interaction, chapter (11) and the process of formation of Dark matter and Dark energy (Chapter 12).

Chapter 13 is devoted to the question of "searching" for Antimatter in the Universe.

Chapter 14 summarizes all the main results of constructing and theoretically verifying the consequences of the proposed S_theory, the coincidences and differences with the Standard Model are noted, and a list of proposed experiments is provided to test individual positions and predictions of S_theory.

Chapter 15 deals with issues that go beyond S_theory and relate to the Theory of Space. An attempt is made to model the structure and processes occurring in space (the space-time model of Vtorushin Vladimir space is taken as a basis, which is creatively modified by the authors). On this basis, physical models for the formation of virtual photons in space, primary first-brick of matter (simple) are proposed, and one of the variants of the Universe formation is considered.

When presenting the material, priority is given to the physics of processes, and not to their mathematical description. Of great importance is the chronological component of the processes.

The decomposition of complex processes into chronological components, and also the using of the principle that at one point in time only one event can occur in one point (a region occupied by one elementary object), in which no more than two events can participate (at a high density, not more than three) elementary objects, allowed us to repeatedly exit difficult situations, when the consideration of the issue seemed to have reached a dead end.

Chapter 1. Simple - first-brick of matter construction of the universe

Introduction

"Modern physics follows the epicycles of Ptolemy"

Emil Ahmedov (video post on the site of post-science.rf)

The basis of modern physics is the Standard Model (CM). All physicists recognize and even admire it, listing a long list of its merits. And all physicists at the end of this list will necessarily bring a list of issues not solved in the SM, and add that these issues should be solved by some new physics, the options of which are discussed quite a lot.

All this is good, but a significant part of the scientific physical community has long been "bothered" by the idea that in the SM and in the discussed variants of new physics the mathematical component of physical phenomena is hypertrophied exaggeration and the thought is forgotten that mathematics is only an abstract representation, both, about real physical processes, and about virtual ones. Moreover, the result of mathematical modeling of virtual processes can very well coincide with the experimental results, but this does not mean that we have learned the truth.

Famous physicist Emil Ahmedov graphically illustrated this situation on the epicycles of Ptolemy. Ptolemy, of course, was a great clever man who, based on the erroneous model of the geocentric Solar System, with the help of virtual epicycles invented by him, moving the planets in his orbits, to build a unique mathematical model that allows to determine with exceptional accuracy the coordinates of the ship by the corners of the place of the planets. But the most surprising in this example is that after the appearance of the correct heliocentric system of Copernicus, most scientists for 40 years preferred the Ptolemy system, which gives more precise coordinates. Only after Newton, on the basis of the law of universal gravitation, calculated that the planets rotate not in circular but in elliptical orbits, and this allowed to obtain the necessary accuracy of calculating coordinates by the Copernican system, the learned world agreed with the new system of building the solar system. "Modern physics follows Ptolemy's epicycles," Emil Ahmedov concludes his post and we agree with him.

Where is the way out of the mathematical epicycles of modern physics?

At one time we were taught that in the beginning there should be a physical model (PM), then a mathematical model (MM), then an experimental model (EM) (experiments, observations). For those who prefer mathematics, you can write:

$$\text{TRUE} = \text{PM} + \text{MM} + \text{EM}$$

The order of construction and analysis of models on the right side can be changed, but so that to do without a physical model at all is nonsense. And we do not exaggerate, try to give a description of the physical model of any elementary SM particle. It is unlikely that you will succeed, you can only say that this is a point with a number of parameters. And then these parameters went "walking" in mathematical formulas, but from where these parameters appeared, no one will ever explain to you.

Of course, the godfather of the mathematical approach in physics is the brilliant Einstein. In the middle of the last century, his approach to physics won, that if one can not measure what we are making up (there is no such subtle instrument), then let's do the mathematical descriptions of this and not fooled . (A free exposition in our interpretation).

The mathematical approach to the development of physics in the conditions of the limited possibilities of the then available tools, of course, played its progressive role, the development of physics did not stop, and the mathematical apparatus used by physics was enormously developed. But a powerful technological revolution, which occurred in many fields of technology in the last 50-70 years, greatly expanded and increased the accuracy of the instruments used by physicists. The issue of resuscitation of approaches to the development of physics, based on adequate physical models, is on the agenda.

The dilemma (or rather, the drama) of modern physics is that if we do not return to building physical theories based on physical models, then we will never get out of the cycle of epicycles.

Opponents, of course, will say, "What is the use in these fictitious physical models, if they can not be measured, there is no such toolkit". Once again will say , many things can be measured today, moreover, no one has abolished the method of checking theories by the consequences arising from them, only the consequences should be built not on a mathematical basis, but on the basis of physical models.

In the present work, an attempt is made to break the "carousel" of epicycles and to construct a physical model of the first-brick of matter, of which elementary SM particles are composed. Based on the proposed models of particles and their properties, a single concept of the formation and evolution of the universe is being built.

Variants of experimental search for particles (insert from 10/18/2017)

The history of the study of the structure of matter (substance) went from top to bottom: first the idea of atoms was born, then scientists uncovered the structure of atoms (nucleus, electron shell), then the structure of the nucleus (protons, neutrons), and more recently the structure of nucleons (quarks, gluons). The theory of the Standard Model was born - a list of all the elementary particles that make up the universe. Now all physicists agree that all elementary particles of the Standard Model should have some first-brick of matter, of which they all are.

Involuntarily there is a desire to break up the known particles to "see", and what they have there "inside". For this purpose, starting from the 1930s, a new class of instruments was created-accelerators, in which charged particles are accelerated to about light velocities and hit at targets. In the 1960s, in order to increase the particle interaction energy, the idea of constructing accelerators with colliding beams arose and was realized. To increase the energy of interaction and the probability of collision of particles in these accelerators, packs (patch) of charged particles or isotopes are used. The apotheosis of the realization of this idea is the accelerator LHC, which currently provides the energy of particle interaction to 13 TeV (proton-proton), and this is not yet its calculated limit.

For several decades of painstaking work, many new particles were discovered, the bulk of which belongs to the class of super massive short-lived (virtual) particles. It is assumed that these particles existed in the first moments of the Universe existence after the Big Bang. Analysis of the decay channels of these particles yields a set of known elementary particles according to the Standard Model. The Higgs boson, discovered in 2012, was the last element of the Standard Model, and not its development. "Theorists are preparing themselves for a" nightmare scenario, "in which the LHC generally does not open any path towards a more complete theory of nature" [34].

It turns out that the initial particles in the reactions on the accelerators are either not formed, or they exist a very short time between the collision of particles and the formation of massive particles. The detection of the sought-for particles in a given very short time is hampered by the large number of various other products of the decay of particles arising from the impact of patchs. At the same time, the theoretical question of how first-brick of matter were born before (or during) the Big Bang in experiments on accelerators remains open, in our opinion.

Without going into a more detailed analysis of the problems of search for particles in accelerators, it should be noted that ideas have been actively developed recently and experimental attempts are being made to implement a "natural" scheme for the production of first-brick of matter by irradiating a vacuum containing various virtual particles (VP), by a power pulse field (PPF). In the proposed theoretical models are often VP considered as virtual electron-positron pairs (VEPP), and as PPF a powerful X-ray electron laser is proposed [32, 33].

Without subjecting the given scheme to criticism (especially since it has already been implemented and real experiments are underway, which, of course, will give new practical results), we propose another scheme of experiment in our work.

Scheme of experiment on the formation of simple (1st part)

The basic idea of the experiment is as follows: As a VP, we propose to "use" virtual photons (which are known to be produced in a vacuum in a large number), and use short pulses of a powerful magnetic field (PMF) as a PPF. In the course of the exposition of the work, we will detail the individual parameters of this experiment (VP and MMP). And now you will be offered a physical model of the formation of simple (the result of this experiment) and analyzed the properties of the simple being born.

The physical model of the process of the birth of first-brick of matter

"An electron in a magnetic field begins to move in a spiral"

V. Rubakov (lecture at the Polytechnic Museum)

A well-known theoretical fact, repeatedly confirmed experimentally: the flying electron walk into on" the magnetic field, and it began to move in a spiral. This image, cited by V. Rubakov in one of his speeches, led us to the idea of what would happen if a closed vortex of an electric field (E) was placed in the place of an electron, for example, a virtual photon (VP).

We draw your attention that this is not a charge, but an electric vortex. In theoretical physics, there are some analogues of this mental experiment (for example, Abrikosov vortices in cryogenic superconductors), but there are completely different external conditions. We will not "break the spears" and to engage in a rigorous conclusion of the result of this experiment, especially since the theoretical apparatus of the physics of electromagnetic vortices has a number of "white spots" (which we will talk about below).

The result of the proposed experiment may be a well-known object in physics, the existence of which no one argues, only nobody experimented it.

Unable to make a theoretical calculation of the result of the experiment, we formulate the process and the result of this experiment in the form of **postulate No.1**:

The electric vortex of a virtual photon (VP) under the influence of a short-time powerful magnetic field (SPMF) is stretched into a vortex-spiral, inside which an intrinsic magnetic field is generated. When the external magnetic field is "turned off", the magnetic poles of the internal magnetic field at the ends of the vortex-spiral are attracted together, they bend the vortex-spiral into a "bagel" and "snapped" with each other. As a result, an electromagnetic torus (a bagel) is formed, inside of which a magnetic vortex is spinning, and electric vortices rotate around the outer "surface" of the torus.

In fact, we have received a "perpetuum mobile", whose internal magnetic vortex generates toroidal electric vortices, which in turn "drive" (generate) an internal magnetic vortex. The absence of any "friction" inside the vortices makes it possible to "function" for such an object indefinitely.

Cosmological remark (№ 1): We have received a marvelous beauty and grace decision! Neither Nature nor God could pass by him!

It is this electromagnetic bagel that can be considered as the simplet first-brick of the structure of matter (see Fig. 1_1).

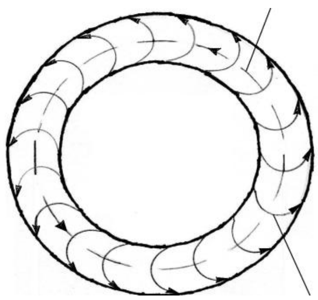


Fig. 1_1. Electromagnetic bagel (first-brick of matter)

Terminologically similar objects in physics are called differently: anapol (an anapole of Zeldovich), rotating electromagnetic fields, etc. Each author at the same time ascribes to them a different set of properties.

Below, we will look at the properties of our first-brick of matter and, since the set of properties of our "bagels" will differ somewhat from the properties of similar objects in other sources, we will be give our bagels the special name - simple, and for brevity and when writing formulas we will be denoted them by the letter S. We will call them the simple (simplet), and the concept of constructing matter from simple below will be called S_theory (ST). S_theory belongs to the class of preon models of the structure of matter.

Circuit simple in Nature

At this point, we have decided on the initial conditions for the birth of simple, the presence of closed electric vortices (which may be virtual photons) and a short-term powerful magnetic field (SPMF).

With virtual photons everything is clear, they are constantly "born and die" in the surrounding space a great many.

The sources of a powerful magnetic field in Nature is also abundant, but we are interested in something super-powerful and short-lived. What is it?

An interesting "quoting" arises with the answer to this question. In accordance with the conceptual approach of S_theory, all objects of the universe must consist of simple. And this means that this object, from which the SPMF flew, "by definition" should consist of simple. Otherwise the simple themselves are formed under the influence of a magnetic field, coming from an object consisting of the same simple. It turns out a famous rebus about a chicken and an egg, on rather a Cycle.

The cycle can be solved by sequential analysis of all links of the cycle and search, - where is this cycle can be broken and "straightened out". Otherwise we can assume that the cycle is a carousel, a circuit of something of the same type (for example - the water circuit in Nature).

We follow the second path and propose **postulate No. 2: All matter consists of electromagnetic vortexes (simple) passing from one species to another.**

Let us illustrate this postulate, adopted in S_theory, with the **Cosmological Concept of the Circulation of Electromagnetic Vortices in Nature:**

By virtual photons (E / H_vortices) "beats" SPMF (E / H_vortex); simple are formed (E / H_vortices); all substances (particles, nucleons, atoms, stars, galaxies, etc.) are constructed from simple, in other words all matter also consists of E / H_vortices; well, once all the stars go out, the whole substance will swallow black holes (BH), and naturally one can assume simple are formed inside the BH, but very "big" ones (ie also E / H_vortices). And it is these "big" simple will be once burst (in other words, they explode) and a powerful magnetic flux (SPMF) is pouring outward, which "beats" on virtual photons and everything starts from the beginning. The cycle is closed!

In this chain of events, compared to the "conventional" chain, we (the first) changed the terminology - the singularity (BH) was called a "big" symbol, (the second) we introduced the statement that all matter and BH consist of simple, and (third) we made a "bold" assumption that BH can "explode".

The terminology is left to the conscience of the authors (it is easier for us to emphasize some unifying moments of S_theory).

With the statement that the whole matter consists of simple is also "clear" (throughout our work we will show how elementary particles, nucleons, etc. are constructed from simple).

And with the assertion that BH is a "big" simple, even a bit simpler than with substance, it is not necessary to "invent" some internal structure of building BH from simple, deal with their properties, interactions, etc., - ripped falling on the BH substance by tidal force on the simple, dispersed them faster, heated up "hot", tore off the bagels of simple in spirals, and "pushed" them with gravitational force into one common "big" simple_bagel, and BH is ready.

But, there is also a fundamental difference: As in the transition from elementary particles (EP) to simple, we have given to the simple the size and shape in space (it is a torus, unlike the point model of EP) and is endowed with electromagnetic substance (closed electric and magnetic vortices), thus and the "big simple," unlike the singularity, it has a certain spatial extent and is an electromagnetic torus with a powerful magnetic vortex inside, but probably with a much greater density (estimates different density of simple will be given to us in the following chapters of our work).

But is a new question: How does the "big simple" burst, splashing out a powerful magnetic field, after all he must have an event horizon that should not let anything out (?)

On this issue, we can "model" a couple of options for the development of events:

<u>Option 1.</u> Two BHs collide (forehead on forehead), the bagels of both BH burst, they turn into cylinders, the ends of which go beyond the horizons of events, and from them a powerful magnetic field pours out.

<u>Option 2</u>. BH can have some critical mass, exceeding which leads to the "cracking" of toroidal electrical vortex, the torus bursting, they turn into a cylinder and then the first variant. This option is likely possible with the formation of super_BH, "swallowed" in itself the entire substance of such large-scale objects of the universe, as a cluster of galaxies.

There are other options, but more on them later.

Some readers could be confused that we have united under the same term simple such different objects as simple-first-brick of matter , of which elementary particles are composed, and a "big" _simple, that is, BH. Unity of terms (simple) in this case means that we are talking about the unity of their internal structure (a closed magnetic vortex surrounded by toroidal electric vortices).

To better understand this thesis, let us cite one more intermediate example of simple, it is the ball lightning (BL). It seems to us that this is also a simple.

S_ model of ball lightning (edition ST2 of August 10, 2017)

Scientists have long argued that such ball lightning (?) There are different theories, one of them we really liked [1]. It is known that ball lightning are born during a thunderstorm, and so in this theory it is suggested that lightning (and it is far from straight) can make a curl in its path. As a result, a closed electric vortex is born that envelops itself with toroidal magnetic vortices; it turns out a kind of reverse simple, which is all the opposite (inside are electric vortex, and magnetic vortices rotate through the torus). Next, the author analyzes the time of existence of this object, its properties, etc.

In this scheme, the bottleneck is the "curl". In the energy sense, this is an "extra" job. It seems to us that the current of linear lightning "runs" not along a curl, but along a spiral (for example, by a spring from a clamshell, thrown by the wind on a tree, or by a spiral liana wet from the rain, with resistance of the breakdown between coils of the helix is greater than the resistance of the spiral turn). Under the influence of current, the liana burns and a spiral vortex of charged particles (plasma) is formed in its place, inside which (along the spiral axis) an internal magnetic field is generated, creating opposite magnetic poles at the ends of the spiral. Under the influence of the magnetic attraction force, the plasma spiral winds up into a torus-like aggregate, inside of which a magnetic vortex "swirls", but vortices from charged particles of plasma on the surface of the torus. A magnetic vortex generates electric vortices on the surface of the torus, which act as an emf for charged plasma particles. In turn, toroidal electric vortices and vortices of charged particles generate (maintain the energy potential) a magnetic vortex inside the torus. The effect of plasma particles on the atoms of the ambient air leads to their ionization and the emission of secondary photons, which is perceived as a glow of ball lightning , and gradually consumes the energy stored by the ball lightning . Outside, we perceive the resulting electromagnetic unit as a luminous spherical ball lightning.

The resultant simple - ball lightning, of course, has completely different parameters than the simple - "first-brick" (formed from a virtual photon) or "large" simple_BH. But the ball lightning is also simple.

Note: Ball lightning, strictly speaking, is, of course, a pseudo-simple, because in its electric vortices, electrons and charged ions are spinning, actually plasma. What is "spinning" in the vortices of real simple (say, in the electric vortex of a virtual photon), we still have to find out. This question (birth of virtual photons), as well as the question of where the first burst BH originated, go beyond S_theory and we will consider them in the chapter "Fourth Physics" (space physics).

Types of electromagnetic simple

S_ theory claims that all matter consists of electromagnetic vortices (simple).

Analyzing this postulate in the previous chapter, we have already noted that the associated electromagnetic vortices (simple) appear before us in three types.

1 type (simple-type 1) are simple-bagels (electromagnetic vortexes twisted into toroidal bagels), the main object of our consideration. More often we will call their "simple". They are of several standard sizes and are the main building blocks of the basic particles of matter.

Type 2 (simple-type 2) is, as it were, a single electromagnetic vortex. These include virtual photons, real photons, gluons, and somewhere near them are electronic neutrinos and antineutrinos. These simple-type 2 are secondary (except for virtual photons), i.E. are formed in the process of decay of simple (type-1).

Below we will discuss in detail the physical models of simple type-1, describe in detail the process of their formation and decay, define their basic parameters, we will propose S models for constructing from simple the basic particles of matter and the subsequent formation of the spectrum of atoms of isotopes.

Naturally, when describing these processes and constructing these models, we will not be able to do only simple_1 types (simple), we will need to use simple_type 2 (single EM vortices). Therefore, in addition to simple_type 1, we will have to give a description of the internal structure, the processes of birth and differences from each other of simple_type 2.

Given the extremely "small" scale of type-2 simple, in physics there is a large deficit of reliable knowledge and data on the physical parameters of simple_type 2. Therefore, our descriptions of these objects will be based, first of all, on the internal structure of the simple_1 types from which they were formed, and basically have a qualitative (phenomenological) character, the main emphasis will be on their electromagnetic-vortex nature.

Descriptions simple_2 type in terms of S_theory, we will do as we meet with these objects in the course of the presentation of our work.

Above we already "met" with virtual photons, below is their description from the point of view of S_theory.

Note: We have also noted that there is also the third type of simple - these are "big" simple formed by the merging or absorption of 1-st and 2-nd type simple. Representatives of the "big" simple of the third type are black holes (BH). We will "talk" about them separately in a special chapter of our work.

Virtual photons (vortex model)

Virtual photons in the list of simple_2 types stand somewhat apart from others and have one fundamental difference - they are born, as it were, "on their own" (from the "vacuum"), while other simple-type-2 are born from simple-type-1.

The S-model of a virtual photon is of two kinds (see Fig. 1_2). One type (a) is a closed electric vortex with the magnetic moment vector (electric vortex is a miniature magnet), the second kind (b) is a closed magnetic vortex with the vector of the electric moment (magnetic vortex - miniature dipole). In the figure, the plane of the vortices is located to a viewing angle of about 45 ° and not conditionally transparent.

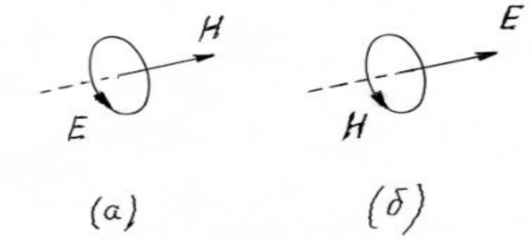


Fig. 1_2. Types of virtual photons: (a) - electric vortex = miniature magnet,

(b) - magnetic vortex = miniature dipole

Virtual photons are short-lived particles, without an impulse, so they can be considered static. This circumstance is essential, as an initial condition for the formation of simple.

The main role of virtual photons lies in the fact that they are "embryos" for simple. It is from virtual photons of the form (a) under the influence of a short-term powerful magnetic field, simple (the main characters of our work) were formed.

In addition, virtual photons play an important role as intermediaries in the transfer of electromagnetic fields and the realization of electromagnetic interaction forces. In S_theory, these questions have their own interpretation, and are summarized in a separate chapter on the field S_ theory.

Properties and parameters of simple-bagel

Before proceeding to the "construction" of elementary particles of SM from simple, one must determine their properties. So far, we know about them, that these are some "body less" E / H vortices that "swirled" into a kind of bagel and auto generate each other.

An important difference between simple is their spatial extent (the structure, although quite simple), in contrast to the elementary SM particles, which are postulated as point objects.

The spatial extent and internal structure of the simple allow us to give a physical justification for the appearance of a number of properties (parameters) in simple.

Below, we consider schemes (processes) for the formation of physical properties (parameters) of simple, while without determining the numerical values of these parameters.

Shape, dimensions of simple

The shape of the simple-bagel is shown in Fig. 1_3, where D is the outer diameter of the torus, d is the diameter of the circle forming the torus (in our case this is the diameter of the closed electric vortex of the virtual photon, which, under the influence of theM SPMF, sprawled into a spiral, and then curled into a torus).

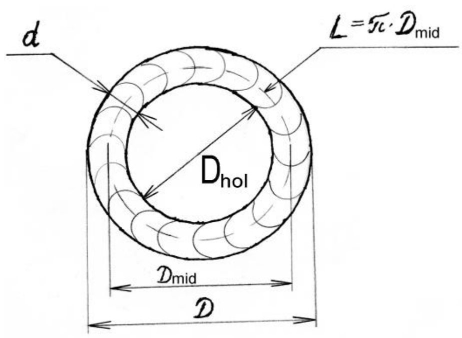


Fig. 1_3. Shape and size of simple.

D_{hol} - reference size of the torus aperture (D_{hol} = D - 2d).

A very important parameter of simple is their length (L) at the helix stage. When folded into a bagel - the length of the simple-spiral becomes equal to average diameter of the donut torus (D_{mid}).

The length of the simple can be different, depending on the conditions of their formation (the angle of orientation of the VP relative to the SPMF - see the section devoted to the spectrum of lengths of simple).

Mass (energy) of simple

The simple is an electromagnetic vortex connected with each other. Such a structure must have energy. If the simple has energy, then, in accordance with the well-known formula $E = m*c^2$, we can definitely say that the simple has mass. Let us ask ourselves: do the electric and magnetic components (vortices) contribute to the mass of the simple?

It is known that for open electromagnetic vortices (photons) the energy of an electric vortex and a magnetic vortex are equal to each other.

However, for closed electromagnetic systems of the simple type, when one type of vortex is "packed" into another type of vortex, the energy ratio of different types of vortices requires a theoretical and experimental verification. Such a theoretical estimate will be given in Chapter 3, after calculating the geometric parameters of the simps and their vortices. Looking ahead and not going into the calculation methodology, we note the result that, according to our estimate, the ratio of the energy of the magnetic and electric vortices of the simple is of the order of 10^{10}:1.

Proceeding from this, we conclude that for the mass of the simple is its internal closed magnetic vortex (postulate No. 3).

This postulate can be verified experimentally - a powerful transformer in the switched-on state should weigh somewhat more than in the switched-off state. Even better, if the experiment is carried out not at the household or industrial transformer, and super electromagnets LHC or TOKOMAK. Without special preparation, of course, such an experiment is unlikely to yield a positive result, the influence of the Earth's magnetic field and other external factors can be affected.

Tighter experiment might look like - it is necessary to take a coil (toroidal magnetic core wound without gaps between windings), suspend it on a thin rubber thread, measured oscillation frequency (upwards - downwards) of the resulting rubber pendulum and start feeding current pulses with frequency pendulum and pulse length equal to half the period of the pendulum (see Fig. 1_4).

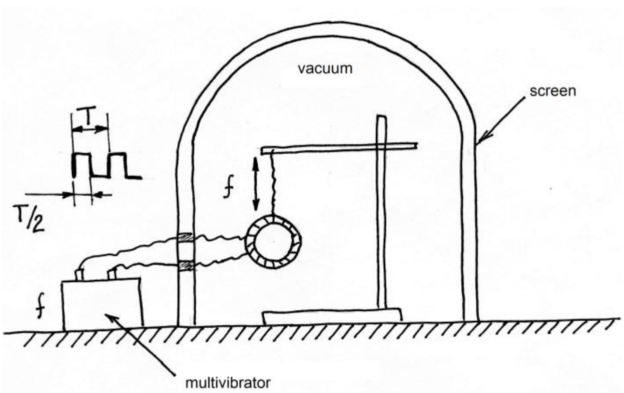


Fig. 1_4. The scheme of the experiment to verify the increase in the mass of the solenoid, generating a closed magnetic vortex.

The resulting magnetic field in the solenoid will give an additional mass (weight) to the solenoid - the pendulum should slightly swing down (towards the Earth). In the interval between the current pulses, the elastic of the pendulum must pull the solenoid upward. These movements may not be noticeable at first, but in time the pendulum must go into resonance and the movements will become noticeable. The installation must of course be screened from external fields, air must be evacuated from it and other measures taken to avoid distortion of the experimental results.

If this experiment gives a positive result, then it can be stated that the closed magnetic vortex of the simple gives it mass. If the result is negative, then a mass of simple will have to be postulated (as in the SM until 2013) or to attract the Higgs boson to be the "assistants" (as in the SM after 2013).

Note to postulate No. 3: Many electromagnetic physicists identify the energy of electromagnetic vortices with the energy of the electro-magnetic field. We will neither agree nor dispute this interpretation, we just want to note that postulate No. 3 offers a definite physical model that materializes the formula $E = m * c^2$. In fact, it turns out that for the mass and for the energy there is the same substance - the closed magnetic vortices of the simple, of which all matter is composed.

This interpretation will help us in some difficult cases when analyzing questions - where did the mass (energy) go, or where did it come from? The answer to these questions will be bounded by the physics of the process, where the part of the closed magnetic vortex has break up, the mass has break up there, and vice versa, the "addition" of simple into a single "aggregate" leads to the addition of their masses, minus the "waste".

Thus, speaking of the mass of the simple, we also have in mind the energy of its internal closed magnetic vortex (for brevity, the internal energy of the simple) and vice versa. Where did this energy come from and, correspondingly, the mass of the simple? Let's recall the process of birth of simple.

A virtual photon is considered a massless particle, despite the presence of a closed magnetic vortex. We will not dispute this statement, especially since the VP is virtual - i.e. his life is a very short time.

But the powerful external magnetic field, which stretched the VP into a spiral, certainly contributed to formed energy into simple. He, like a stretched spring, absorbed the colossal energy of SPMF.

It is this energy in the future that will be released and flown away when the simple collapse in various nuclear reactions, creating, as follows from postulate No. 3, the corresponding defect of the masses participating in particle reactions.

Density of simple

The density of the simple is equal to the mass divided by the volume of the torus. It is assumed that all the simple of matter have the same density.

After determining the mass and dimensions of the simple, we calculate their density and will be comparable to the density of nuclei (nucleons). The density of black holes is discussed separately.

Electric charge of simple

The problem with the electric charge of the simple is more complicated. In SM, the electric charge of the elementary particles is postulated, and its magnitude is determined experimentally.

We have would like to connect electric charge of simple to some of its elements (like mass with a magnetic vortex). In our scheme forming of simple, no charged substances were involved. Where does the electric charge come from, especially since there should be simple with a negative charge and simple with a positive charge? What is responsible for the charge of the simple?

Getting a closer look at the process of creating simple more closely, you can see that we have two types of simple. Initially, they differ in the way in which the magnetic moment of virtual photons from which the simple bol data is generated is oriented differently in space relative to the external magnetic field vector (SPMF). In one case, these vectors can coincide in direction, and in the other case have the opposite direction, see Fig. 1_5 stage (a) - before "inclusion" of SPMF.

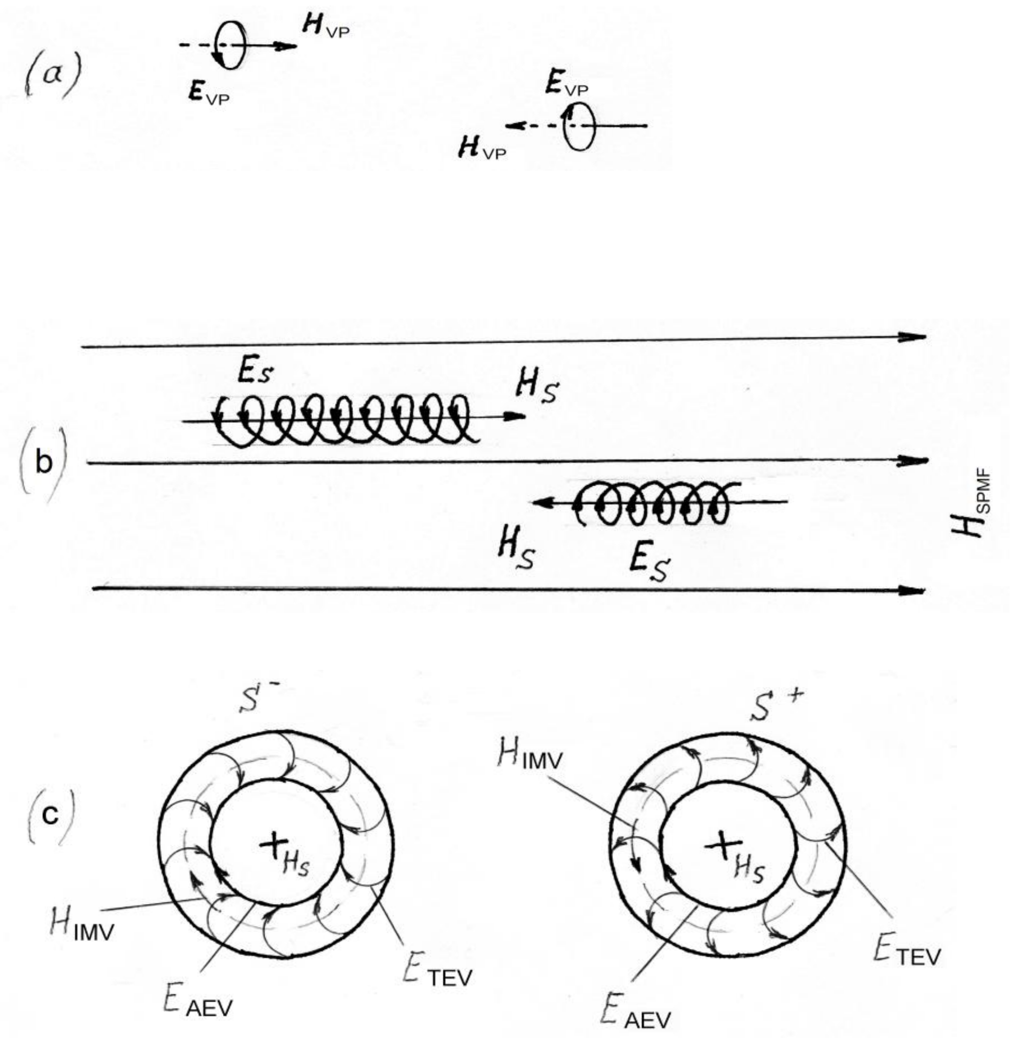


Fig. 1_5. The stages of the birth of the simple with negative and positive electric charges from the VP with different orientations relative to the SPMF.

Accordingly, in the first case, the spiral of the simple will be stretches with the right-hand "winding" of the turns of the electric vortex, and in the second case with the left-hand "winding" of the turns of the electric vortex, see Fig. 1_5 stage (b). We would like to draw your attention to the fact that in VPs, which have an orientation of the magnetic moment opposite to the SPMF, the internal magnetic field partially compensates the SPMF. As a result, the VP data are stretched into spirals of shorter length than the VPs, which have a magnetic moment orientation coinciding with the SPMF. The significance of this circumstance will be discussed below.

Well, and after "off" of the SPMF, the helixes of the simple are folded into bagels. In this case, spiral electric vortices decay (decompose) into a toroidal component (toroidal electric vortices) and an azimuthal component (azimuthal electric vortex-AEV). In one case, the AEV will coincide in direction with the direction of the magnetic vortex of the simple, and in the other case their directions will be opposite, see Fig. 1_5 stage (in).

Therefore, we dare to propose **postulate No. 4: the appearance of charges in the simple is the result of the presence of azimuthal electric vortices (AEV) in them. The sign of the charge depends, in this case, on the direction of the data of the AEV vortices. The AEV vortices coinciding in direction with the internal magnetic vortex of the simple generate a charge with the minus sign (-), and the AEV vortices directed against the internal magnetic vortex of the simple generate a charge with the plus sign (+).**

This assumption (postulation) we have do not "from scratch". When studying materials on the physics of electromagnetic vortices in different sources, we repeatedly came across conclusions that do not fit into the canons of classical electrodynamics.

As an example, we can give a description of the experiment of F.F. Mende [2], in which he, by inducing a vortex current in an electrically neutral cryogenic superconducting torus, detected the appearance of an electric charge on it in relation to the screen. Fedor Fedorovich connects this phenomenon with the speed of movement of electric vortices arising in the cryogenic superconducting torus.

In our case, within the framework of the simple, there is no movement of vortices, they spin themselves and spin in one place. There is only difference in their mutual orientation. Therefore, it seems to us that **postulate No. 4 can be restated as follows: the generation of an electric charge is the result of the mutual orthogonal arrangement of the toroidal and azimuthal electric vortices. And, in the case of a connection between them by the rule of the right-hand gimlet, a charge with the sign "-" is generated, and a charge with a "+" sign is generated by the rule of the left-hand gimlet.**

This formulation of postulate No. 4 seems to us to be more correct.

All this must be checked, of course, experimentally. But other differences in the bagels of sims that could be responsible for the birth of charges, we can not have found.

In general that the physics of electromagnetic vortices requires additional investigation and experimental verification, which we will encounter more than once in this paper.

One possible scheme for testing the generation of electric charges can be constructed on the basis of a pendulum with a solenoid containing an additional azimuthal turn of the wire (see Figure 1_6).

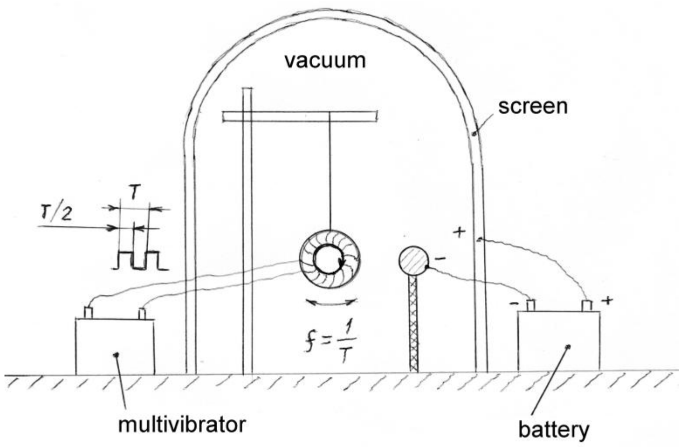


Fig. 1_6. Scheme of the experiment on testing the generation of electric charge orthogonal electric vortices.

In the experiment, a pendulum formed by a thread is used, at the end of which a solenoid is attached with an additional azimuthal turn of the wire (shown in the figure with a thick line). The pendulum is located near a charged body, the continuity of the charge on which is supported by one of the poles of the external battery.

Pulses of a current with a frequency equal to the frequency of the pendulum and a pulse duration of half the period are fed to the pendulum solenoid. If the orthogonal coils of the solenoid generate at least a small electric charge, it will begin to interact with a stationary charge, the pendulum must enter resonance and swing.

True, the proposed scheme is largely conditional, because it simulates the interaction of orthogonal electric currents, rather than orthogonal electric vortices, as it is supposed in connection with the simple in postulate No4.

Most likely, a true experiment to test postulate No. 4 will require cryogenic temperatures, superconductors with vortex conductivity and other precision instruments.

Magnetic moment of simple

After we "discovered" the azimuthal electric vortices in the simple-bagel, the problem of the appearance of the magnetic moments of the simple is solved automatically.

In Fig. 1_5 (c) the azimuthal electric vortices are directed clockwise, and the magnetic moments of the simple are directed from the reader beyond the plane of the figure and are indicated by a "+" plus (the feathering of the arrow).

The above properties are already sufficient to proceed with the "construction" of elementary particles from simple. But let us note some more "mechanical" properties of simple, which are also important for constructing matter from simple and additional understanding of the physical processes taking place in matter.

Note:

Here we would like to draw the readers' attention to the special role of the azimuthal electric eddies of simple. It is thanks to them that all simple acquire electric charges, and simple-bagels also have additional external magnetic moments. Furthermore, the exceptional role of azimuthal electric vortices in the formation of strong interaction forces will also be shown.

It is thanks to the presence of azimuthal electric vortices into simple, the simple acquire the ability to electromagnetic interaction and the construction of basic elementary particles, from which the substance is formed.

The spin of the simple, the "mechanical moment", precession (the excitation and emission of excess energy)

"Rotation" of the internal magnetic vortex is responsible for, as we "agreed", for the mass of the simple, does not remain unnoticed outside the simple. In fact, we got a small gyro with its "mechanical moment", spin and a certain amount of stored internal energy.

The term "mechanical moment" is taken in quotation marks is not accidental. It means that we are not talking about the trivial mechanical rotation of the simple. And about what? This is the rotation of the internal magnetic vortex inside the simple, which is responsible for the mass of the simple. In fact, our "mechanical moment" is a consequence of the postulate of identifying the mass and the internal magnetic vortex of the simple. Physically, the "mechanical moment" should manifest itself as an ordinary mechanical moment (without the quotes), but be calculated somehow quite differently.

As is known, one of the integral properties of a gyroscope is precession, which occurs when an external action on a gyroscope tends to change the direction of the gyroscope axis. In the case of simple, the precession mechanism is very good for the "absorption" of energy, that acts on a simple, without changing the structure of the simple.

Thus, for example, the external mechanical action on a simple (the impact of another particle, for example, by a real photon) will result in the "excitation" (precession) of a gyro (simple), and the disappearance (absorption) of a photon. Let's consider this process in more detail.

Note: The reactions of the interaction of elementary particles are usually taken to be graphically depicted in the form of Feynman diagrams. S_theory postulates that all particles consist of electromagnetic vortices and that all reactions and transformations of particles are the result of the interaction of electromagnetic vortices. Therefore, to illustrate all subnuclear and nuclear processes, we will use non-conditional graphic images of particles and Feynman diagrams, and "real physical images of simple, primarily reflecting their electromagnetic vortices, and the dynamics of the process will be described in words. It should be noted that in the transition to structured and extended particles, all processes also acquire a certain sequence (stages) and dynamics (the rate of alternation of stages). The description of these processes is new, often it can be done only phenomenologically, relying on analogs in other sections of physics. We will have to use this tool quite often. This will allow us to "sort out" the physical foundations of certain objects and processes and build their S-models. The final confirmation of the accepted S_models is attributed to the stage of checking the consequences arising from S_theory, applied to known and experimentally verified physical processes.

The connection between the precession of simple_bagel and real photons

Let us describe the physical models of absorption and formation of real photons by simple.

<u>S-model of real photon.</u>

On the basis of classical electrodynamics, a photon is a sequence of mutually exciting electric and magnetic vortices. Real photons differ from virtual photons by the presence of a pulse, i.e. they are in constant motion at the speed of light. The concept of "motion" with respect to real photons is relatively - in fact, the "motion" of real photons is due to the elliptical (and not circular) form of electric and magnetic vortices associated with the presence of an impulse in a real photon. The appearance of each vortex in the first focus of the ellipse, and the generation of the subsequent vortex in the second focus of the ellipse, ensures the progressive advance of the vortices forward with the speed of light (see Fig. 1_7, 1_8).

The doubled distance between the foci of the ellipse of each vortex can be interpreted as the Compton wavelength of a photon, which depends on its frequency (energy). The lower the frequency, the longer the wavelength, the higher the frequency, the shorter the wavelength (the distance between the foci of the ellipse).

This S_model of a real photon is consistent with the above S_model of virtual photons having a circular vortex shape (zero distance between foci), which leads to the absence of momentum (mass, energy) in virtual photons.

<u>The process of absorbing a real photon into by simple.</u>

The S-model of the process of absorption of a real photon by a simple is shown in Fig. 1_7.

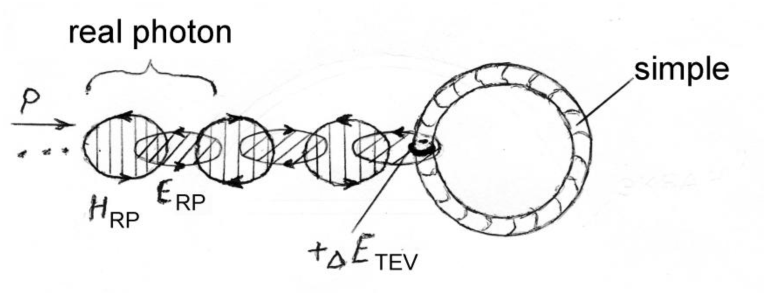


Fig. 1_7. The real photon flies to the simple.

We will not now consider all the variants of the interaction of a photon with a simple in the phases of vortices and angles of attack, let us take the optimal variant, when the photon flies up to the simple by a closed magnetic vortex, and the electric vortex generated by it envelopes the toroidal part of the simple. If in this case the direction of the electric vortex of the photon and the toroidal electric vortex of the symple coincide, then a transformer coupling occurs, through which an additional toroidal electric vortex is generated on the simple, which in turn generates an additive to the internal magnetic vortex of the simple. As a result, the photon was absorbed by a simple, which acquired some eccentricity in the form of additional locally located toroidal electric vortices generating an "additional" magnetic vortex inside the simple. In the mechanical moment of the simple, an imbalance appears, the simple enters the precession mode (was excited), and the real photon disappeared (it was absorbed by the simple).

<u>Now let us describe (phenomenologically) the process of emission of a real photon by a simple.</u>

When the process of pumping the "gyro" of the simple with external energy (precession) exceeds a certain critical threshold, the simple-bagel will "crack" and an "arc" of the internal magnetic vortex will escape outward from the resulting "crack", carrying with it an excess of energy. The precession will disappear, the magnetic forces will again "slammed" the simple's torus, and the outwardly emitted magnetic arc will also close into a closed magnetic vortex that will generate a closed electric vortex, etc. (the excess energy will fly away in the form of a new emitted real photon), see Fig. 1_8.

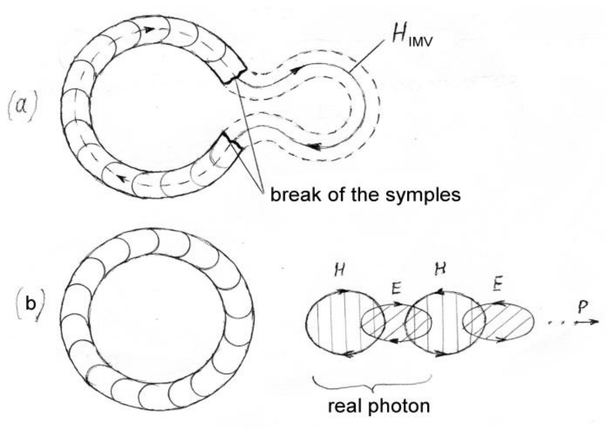


Fig. 1_8. The emission of a real photon by an excited simple.

One of the options for excitation of precession in simple can be the "swing" of the simple forming electrons with the help of an external alternating electric field, followed by the emission of real photons by them when the critical precession threshold is reached. This scheme, in fact, is a physical model of radio antennas.

Taking into account the described processes of absorption and emission of photons, it is possible to make (phenomenologically) the conclusion that real photons are internal vortexes of simple that have escaped away, and have received an impulse. This impulse leads to the transformation of electric and magnetic vortices of real photons from a circular shape into ellipses, all of whose foci are located on the same straight line and are points of generation of a sequence of vortices. These vortex structures are usually called real photons, emphasizing their dynamic nature (the presence of an impulse), in contrast to static virtual photons.

With momentum, real photons are capable of transferring energy, for example, radio waves, light, γ-radiation, etc.

Impulse (energy) of real photons are obtained from the simple at the time of their birth. Above we described one of the mechanisms of the production of real photons.

There can also be other mechanisms of "ejecting" outward from the simple an internal magnetic vortex and converting it into a real photon. We will meet one of them when examining the process of annihilation of the multipolar simple.

The presence of momentum and energy in real photons suggests the presence of an equivalent mass for vortices of real photons, as evidenced in particular by the deviation of the light beam in the gravitational field.

In the 15th chapter, we will analyze the physical model of real photons proposed by us in more detail. Now, in order not to go far "sideways", we will continue to consider the list of properties of simple.

The elasticity of the simple

Proceeding from the physic mechanical properties of the substance in different phases and manifestations, it is possible to extrapolate (make the assumption) that the simple are not plastic and do not stretch like gum. They should be sufficiently rigid in the part of the deformation of the d_diameter helix body of the simple-spirale or d_diameter of the toroidal body of the simple-bagel. But they also need to have a certain possibility of deformation of the round shape of the simple-bagel torus (D_diameter) under the influence of external forces. The best large-scale image for their representation of the elastic properties of simple is a tight rubber expander for training the hand.

If the simple is undergoes a two-sided mechanical action, and with a force that does not lead to the destruction of the simple, the simple can shrink from the shape of the circular torus into the shape of an oval torus, see Fig. 1_9 (a), whose shape is determined by the laws of elasticity and the points of application of forces. If the forcesis removed, the simple will again be straightened into a round torus.

Taking into account the possibility of deformation of the circular shape of the simple torus, it is possible to talk about the points of application of external forces relatively, bearing in mind only the initial moment of contact with the external object. Under the influence of the applied force, the round shape of the simple torus deforms and the point of contact very quickly turns into a contact line along the simple's toroidal surface, but not into the "spot" of the contact, because toroidal vortexs of simple possess rigidity and are not deformated.

An example of a more complicated compression of simple is shown in Fig. 1_9 (b). With some of these simile deformations, we will still meet when we consider the "real constructions" for constructing elementary particles and atomic nuclei from simple.

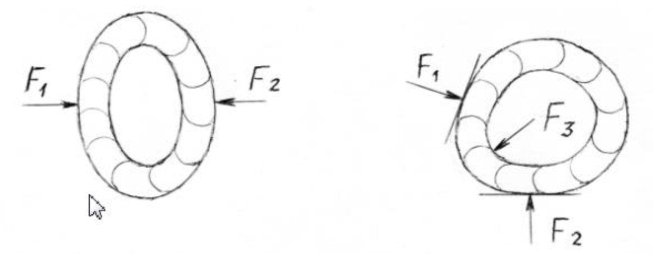


Fig. 1_9. Examples of deformation of simple.

With deformation of the simple torus, the bending radius of the torus decreases in individual sections. At the same time, one should bear in mind that at the surface of the torus of simple-blocks there is a certain minimum critical radius of the bending of the toroidal body of the simple-bagel. If the radius of bending is less than this critical radius, then the toroidal body of the simple-bagel bursts with all the ensuing consequences. These episodes will occur to us when describing the processes occurring in real "S-structures", consisting of simple.

Stability of simple

The simple-bagels folded into a bagel (torus) are stable, without external influence, can probably exist forever.

Properties and Parameters of Simple-Spiral

The properties and parameters of the simple-spirales basically correspond to the similar properties and parameters of the simple-bagels, but they also have their own differences, namely:

• shape - cylinder (L, d);

• There are no parameters: D, Dcp, Dotv, spin ("mechanical moment") of the simple, associated with the toroidal form of the simple-bagels;

• the magnetic moment of the simple-spiral is formed not by a closed azimuthal electric vortex, but is generated by cylindrical (toroidal) electric vortices, directed initially along the axis of the simple, and has a much greater value, compared with the external magnetic moment of the simple-bagel;

• simple-spiral in the free state are unstable, they either collapse into simple-bagel (with sufficient length), or under the influence of their powerful magnetic moments, try to unite into longer blocks (with different results, which will be discussed below), or begin to shorten , dropping turns of toroidal electric vortices (this process will be discussed in detail later);

• other properties and parameters of the simple-spirals corresponds to the same properties and parameters of the simple-bagels.

Spectrum of lengths of simple

Before to "construction" elementary particles (EP) from simple, it is necessary to determine the nomenclature of the basic simple from which we will build these EPs. In most variants of the new physics, the number of "first-brick" variants is limited to one or two basic elements.

With this approach, as a rule, objects equivalent to the smallest elementary particles (electron neutrino, photon) are proposed as basic ones.

This approach leads to the fact that heavy elementary particles have to be built from thousands, millions and billions of basic elements, which hardly corresponds to reality.

In S_theory, an approach is taken to construct elementary particles from a "set of weights" of different masses, but having a single physical nature. What does this mean?

In the section devoted to the sizes of simple, we paid attention to the fact that, in accordance with the mechanism for the birth of simple described above, simple are born of different lengths. This allows us to build particles from simple (bricks) of the same nature, but different in size (and mass).

Let us explain this.

When considering the mechanism of the appearance of electrical charges of simples, we specified that the VP(E-vortex) can be oriented by its magnetic vectors, both in the direction of the SPMF and against the SPMF. The charge of arising simples depends on it.

In addition, it should be noted that, in fact, the orientation of the VP in space can be very arbitrary, i.e. the angle α of the incidence of the SPMF on the VP(E) plane can vary from 0 to 360 ° (where α is the angle between the SPMF vector and the magnetic moment vector of the VP). Accordingly, the equivalent area VP(E), "illuminated" SPMF, changes from 0 (at $\alpha = 90^o$ or $\alpha = 270^o$) to πd2 / 4 (at $\alpha = 0^o$ or $\alpha = 360^o$), where d is the diameter of the electric vortex of the VP.

Naturally, the length of the stretching of VP(E) into a spiral will depend on the equivalent area of "illumination" of the virtual photon, which will be proportional to the absorbed energy of the SPMF expended to stretch the VP to the spiral. For $\alpha = 90^o$ or $\alpha = 270^o$, the VP(E) will not expand at all, and at $\alpha = 0^o$ or $\alpha = 360^o$ the VP(E) stretching will be maximal. The case when $\alpha = 180^o$ is characterized by the maximum area "illuminated" by the VP by the incident SPMF, but by the opposite direction of the vectors of the magnetic moments. The internal magnetic moment of the simple will be in this case counteract the SPMF and the length of the stretching VP(E) in the spiral will be less in this case than at $\alpha = 0^o$. Intermediate values of α will give intermediate values of the lengths of spirals of future simples.

Those. the spectrum of the lengths of spirals of simples will be initially continuous and will be in the range from 0 to some Lmax.

But the continuous spectrum of the lengths of simples does not suit us, it would mean the formation of an infinite number of different simples. Such "building" material does not suit us ("bricks" of completely different sizes).

The output in quantization of the lengths of born simples. The basis of quantization can serve as some resonant processes of the internal magnetic vortex (IMV) or azimuthal electric vortex (AEV), connected with the length of the simples.

The process of quantization proceeds as follows: - after "turning off" the SPMF, the force stretching the VP into the simple-spirale disappears. With the disappearance of the external force, the process of their shortening and convolution into bagels begins. Probably the first process is faster, the spirals will have time to shorten to the nearest resonant length, the process of shortening stops for a while and the spiral will be twisted into a bagel of a specific size.

Let's analyze the process of quantizing (shortening) the length of the symbols in more detail.

The physical model of quantization (shortening) of the lengths of the simple-spiral

The shortening of the simple (the quantization of its length) can not go by contraction of the simple spiral, similar to the compression of the spring, (the energy of the magnetic vortex has been pumped into the simple-spiral, while maintaining the diameter of the spiral (d), can not "shrink" or disappear into nowhere). Shortening of the simple is "decrease the number" of toroidal electric vortices (TEV) from the ends of the simple-spirale. With these coils of TEV, some of the energy also flies away.

For the resonance quantizing the length of the simple-spirale, a resonant contour is needed. The only closed contour in simple-spirale is a toroidal electric vortex. It certainly has its resonance, which maintains the constant diameter of the simple-spirale, but we need a contour connected with the length of the simple-spirale. When the simple-spirale is folded into simple-bagel, it will have a second closed loop in the form of a torus, which will be a resonator for the IMV and AEV. But we are interested in the resonant circuit for them, when the simple is still a spiral.

In the simplest helix there are no such contours. But they can be formed outside the simple-spiral from the garlands of virtual photons-micro-magnets (VF-MM) to close the vortexes of IMV and virtual photons-micro-dipoles (VF-MD) to close the AEV vortices (see Fig. 1_10).

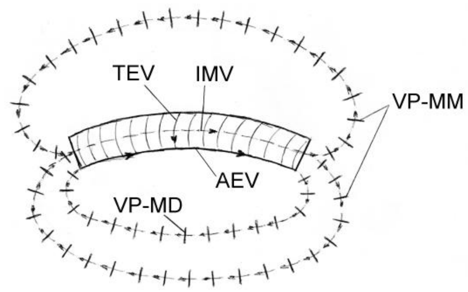


Fig. 1_10. Resonant contours of simple-spirale.

In this case, an external capacitive section of the contour from virtual photons-micro-dipoles (successively connected capacitors) arises in the AEV vortex in addition to the segment along the surface of the simple-spirale (which can be considered as an inductive portion). As a result, a classical resonant circuit is formed, which can have stable resonant lengths.

The inner magnetic vortex will also be closed through the chain of garlands from external micro-magnets located along the lines of force of its magnetic field. We know nothing about the resonances of magnetic circuits (fields). Magnetic fields in all experiments are created and maintained by external sources. But we dare to assume that magnetic circuits can also have resonances. To test this assumption, it is necessary to carry out experiments with "rubber" permanent magnets.

It seems to us (phenomenologically) that the process of shortening the length of the simple-spirale is suspended precisely when a resonance occurs in the closed circuit of the internal magnetic vortex of the simple-spirale with the use of external sections of the chain made of VP-micro-magnets.

The resonance of the azimuthal electric vortex would hardly be able to stop the process of shortening the simple-spirale. Main role AEV of is to generate a electrical charge of simple in conjunction with the TEVs orthogonal to them. The external circuit of the AEV closure through the VP-micro-dipoles and its resonance are needed to preserve the AEV for the period of the existence of the simple in the form of a spiral.

For a certain length of the simple-spirale, the contours of the IMV and the AEB resonate and suspend the process of shortening the simple-spirale, and if the length allows, simple-spirale twisted into a simple-bagel of a particular resonance size.

If the resonance length is small and does not allow the simple-spirale to curl into a simple-bagel, then in the resonance state of the simple-spirale there can be some time sufficient to get together with other simple-spirale. As a result, formed a block, which in turn can twisted into a simple-bagel or take part in the construction of other aggregates.

Separate attention deserves the further fate of those coils who flew from the simple-spirale when shortening individual turns of TEV. These flew away coils of TEV not only "materialize" the process of shortening the simple-spirale and reduce its mass (energy), but in themselves are very interesting objects. They can be called micro-miniature micro-magnets, consisting of a closed electric vortex, with its own magnetic moment.

These objects are simple-2 type. Who are they? The best candidate for this role from the postulated list of simples-type 2 is gluons.

Possessing their own magnetic moment, gluons can participate alongside with virtual photons-micro-magnets in the construction of garlands for closure of the contour of the IMV or other magnetic fields. We will be meet with them in the construction of S_structures of nuclei.

The variant of closure of IMV simple-spirale through garlands of gluons is even more preferable (in comparison with garlands of VP), if we consider that the process of shortening of the simple-spirale (quantization of their lengths) occurs immediately after the process of birth of the simple-spirale, as a result of which expended all virtual photons-micro-magnets, from which simples were formed.

The described process of shortening the lengths of simple-spirale to resonance lengths is one of the basic S_processes occurring with simple in nuclear and subnuclear reactions. We will meet with him more than once, in particular, in the S analysis of the neutron decay process and the nucleosynthesis process.

Note: In considering the process of quantizing the lengths of the simpoles, we introduced a "term" - a garland of virtual photons and a garland of gluons. This concept is not just a figurative "term", it is a new physical model of static fields in S_theory. This issue will be discussed in more detail in a special chapter.

Gluons

Above we presented a physical model for the formation of gluons. Let's try to refine its parameters, at least in relative terms.

At first glance, a gluon should be very similar (or perhaps even identical) to a virtual photon in the form of an electric top (an electric vortex with a magnetic moment). After all, in fact, the simple-spirale was formed by stretching into the spiral of electric vortex of virtual photon under the influence of an external magnetic field. The resulting simple-spirale must have the diameter of the VP from which it was formed. It would be logical to assume that the departed coils of TEV from simple-spirale become again virtual photons.

But let's look more closely (phenomenologically) on this process.

It all began with stretching the electric vortex of a virtual photon into a spiral. If we take several turns of wire and stretch them into a spiral, the diameter of the turns will decrease. Hence, there is a possibility that the diameter of the simple-spirale also became smaller than the diameter of the electric vortices of the virtual photon.

And if, while be in the composition of the simple-spirale, the toroidal electric vortex from the inside was "propped up" by a powerful magnetic vortex, then when it flew off from the simple-spirale, the magnetic vortex inside the TEV coil was "blown off" - its density fell sharply, because the volume of space occupied by a magnetic vortex increases sharply. And this means that a single toroidal turn of the electric vortex could become smaller (in search of a new steady state) and, correspondingly, decrease in diameter.

As a result, if virtual photons are electric vortexs which are called miniature magnets, then gluons are micro-miniature micro-magnets.

This conclusion that the diameter of gluons is much smaller than the diameter of virtual photons is of fundamental importance for explaining the difference in distances to which electromagnetic and strong interactions are operated.

With this circumstance, we will come face to face, considering S_ the construction of a neutron and a proton, and analyzing the mechanism of their strong interaction upon merging in the nuclei of atoms.

Prokvantovanny spectrum of lengths of basic simples

It's time to decide how many sizes of first-brick (simples) we will need to design S_models of basic elementary particles.

As a set of simples (a set of kettlebells) for building all basic elementary particles. It is proposed to use a set of five standard sizes of basic simples having five resonance lengths L1, L2, L3, L4, L5 (in ascending order).

In accordance with the model of quantization of the lengths of simples, all the simples-spirales in the range of lengths from L5 to Lmax shortened to length L5 and twisted into a donut S5 (bagel) with Dmid = L5, where Dmid is the diameter of the midline of the bagel .

All simples-spirales in the range of lengths from L4 to L5 will be shortened to length L4 and twisted into a donut S4 (bagel) with Dmid = L4.

Here we stop for a moment and note that in order for the simple-spirale to twist into bagel, their specific flexibility is required, which is a function of the length (L) and the diameter of the spiral (d). Those. there is a certain Kmin = Lmin / d, for which the simple-spirale, whose length is less than Lmin, will not be twisted into bagel. In other words, we can say that there is a certain minimum critical radius of folding of the simple-spirale, less which simple-bagel can not be formed. And this leads to a very important conclusion: if the "normal" simple-bagel (for example S4) is twisted in such a way that the radius of its bend at some point becomes less than the critical radius, then the simple-bagel will burst and become a simple-spirale . With this effect, we will encounter in real S_structures of elementary particles and processes occurring with them.

Note: Strictly speaking in simple-bagel there are no spiral electric vortexes, but there are toroidal electric vortices and azimuthal electric vortex. As a result of the bursting of such a simple-bagel (in one place), it will turn into simple-cylinder, but not into simple-spirale. But in order not to introduce an additional image-term we will refer to them as before a simple-spirale, although in fact in it the electric vortices have directions not in a spiral, but in the forming a the cylindrical surface and along the cylinder.

Therefore, if L3 / d < Kmin, then all the simples-spirales in the range of lengths from L3 to L4 will be shortened to the resonant length L3, but they will not twisted into bagels, but will "live" in the form of a spiral S3 (sp), while their "life" are supported while energy of internal resonance is maintained.

A similar fate awaits all simples-spirales in the range of lengths from L2 to L3 and in the range of lengths from L1 to L2, they will be shortened to lengths L2 and L1, respectively, and become the simples-spiralesS2 (sp) and S1 (sp).

Of particular interest is the process of shortening the simples-spirales in the range of lengths from 0 to L1. If L1 is the minimum resonance length of the simples-spirales, then this range of simples-spirales should be shortened to zero, i.e. all simples-spirales must to crumble into gluons (this is the first option for shortening the simples-spirales in this range).

But with this option, the question arises, - where did the charge of simple-spirale go? All the turns of the TEV, flew away from the simple-spirale and turning into gluons, but they do not carry away the charge (the azimuthal electric vortex responsible for the charge). Charge of simple-spirale always remains on the shortening simple-spirale. And if the whole simple-spirale is broken up into gluons, then the charge just has to disappear.

By itself, this option can not be ruled out (after all, at the birth of the simple, the charge associated with the appearance of the AEV could have emerged from "neither from where").

However, it seems that the process of shortening the simples-spirales in the range of lengths from 0 to L1 went according to the second variant as follows.

The process of dropping the TEV-gluons lasts on until the simple-spirale attains a certain minimum length, at which the density of the internal magnetic vortex drops sharply (similarly, as in the formation of gluons). At the same time, the remaining inner magnetic vortex is contracted into the flagellum in the center of the remaining short simples-spirales. A gap appears between it and the toroidal electric vortex. This means that an azimuthal electric vortex (AEV), responsible for charge generation, has a "loophole" to close on the inner surface of the TEV coils (see Fig. 1_11).

As a result, we obtained a toroidal aggregate consisting of a certain number of toroidal electric vortices (TEV) that remained from the simples-spirales, enclosing their local azimuthal electric vortex and toroidal envelope from magnetic vortices, giving the aggregate a magnetic moment (see Fig. 1_11).

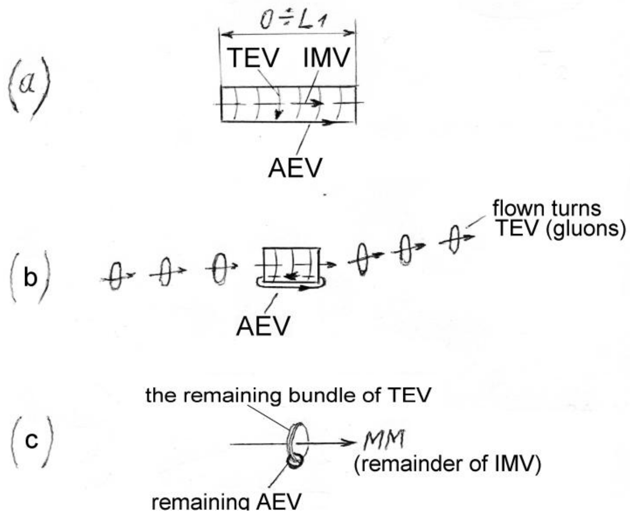


Fig. 1_11. The stages of quantization (shortening) of the lengths of the simple-spirale in the range 0 - L1.

At the same time, the former toroidal electric vortices of the simple-spirale have become internal vortices of this toroidal aggregate, and the magnetic vortices covering them have become toroidal vortices of the aggregate (in the figure they are designated by MM), and among them the former azimuthal electric vortex, now a toroidal vortex in the new aggregate and retained the orthogonal orientation to the internal electric vortex, which as a result ensures the conservation of charge.

And one more aspect of this process. The internal magnetic vortex of the simple-spirale was closed through an external circuit in the form of garland of gluons. When shortening the power of the magnetic vortex constantly decreases, its size along with the simple becomes smaller, and the length of the outer chain, the garland of gluons is shortened accordingly. Superfluous gluons are "squeezed out" of their garland. At the last step of the process, the last gluon is squeezed out of the chain and the magnetic vortex closes independently around the remainder of the TEV vortices. This completes the process of shortening of simples-spirales in the range of lengths from 0 to L1.

The resulting aggregate occupies some middle position between the simples type 1 and simples type-2 (single electromagnetic vortices). Taking into account that the vortices in this aggregate are spinning "on the contrary" - electric vortices rotate inside the toroidal aggregate, and the external bagel of the aggregate forms mainly magnetic vortices, we give it the name - the reverse simp.

The resulting reverse simplex has a magnetic moment and a charge of "+" or "-", depending on the charge of the original simple-spirale.

Later, of a pair of such opposite simples with opposite charges, an electron-antineutrino is formed (but this will be discussed in the next chapter of our work).

Fundamentals of the theory of electromagnetic vortices (TEMV), (insert of 17.11.2017)

We note that the first postulate of S_theory (the idea of the process of the formation of simples), and the connection between the properties of simples and their vortex structure, and the further processes of the interaction of simples and the formation of elementary and basic particles of matter from them, etc. etc., all of them are built on the basis of electric and magnetic vortices and their interaction. There is no separate theory of interaction between electric and magnetic vortices (TEMV) (not to be confused with the theory of interaction of charges, currents and electromagnetic fields - classical electrodynamics). Therefore, we will first have to formulate a number of separate TEMV provisions and postulates, which we will use later to describe our work (we have already used a number of them).

In this paper, we did not initially set the goal of constructing TEMV. The aim of our work was to search for a particle of the first brick, on the basis of which it would be possible to link the questions of the birth and evolution of the Universe on the basis of a single conceptual approach. This conceptual approach (the basis of S_theory) "turned out" electric and magnetic vortices, in all their manifestations, and the processes of their interaction (TEMV). When we started to work, we did not have a ready TEMV, so we had to determine ourselves with separate positions (on the basis of analogs in the theory of classical electrodynamics) and postulates (based on the phenomenological analysis), which together we called the basis of TEMV. Some of the provisions of TEMV are completely borrowed from classical electrodynamics. Below we provide a list of these postulates and provisions. Considering that many of them require additional verification, their list is given not in the cause and effect of the TEMV, but in accordance with the chronology of the appearance of these postulates and provisions in the course of constructing S_theory.

And one more remark, some provisions, postulates and even the terminology of the TEMV will have something in common with S_theory. This is due to the fact that we originally wrote S_theory, thinking that classical electrodynamics would close us all the questions of the interaction of electric and magnetic vortices. It turned out that this was not the case, and we had to "determine" ourselves with certain TEMV questions. Initially, we attributed them to S_theory, now we believe that TEMV is a separate theory (the interaction of electric and magnetic vortices), on the basis of which S_theory (of the formation and interaction of particles) is constructed. Therefore, we decided in the second edition of ST to collect questions related to the TEMV, into a separate section, without rewriting the S_theory itself. At the same time, we got some duplication of the material, we hope readers will understand and forgive us for it.

List of TEMV positions and postulates

1. Electric and magnetic vortices mutually generate each other, there are not single electric vortices or single magnetic vortices. The direction of the vortices is determined by the rule of the drill.

2. There are two classes of electromagnetic vortices: open (virtual photons, real photons, gluons, electronic neutrinos), and closed (simples).

3. All open electromagnetic vortices, with the exception of virtual photons, are born from simples.

4. Closed electromagnetic vortexes (simples) are formed by stretching the electric vortices of virtual photons by an external magnetic field in the vortex-helix, with their subsequent folding into an electromagnetic torus (bagel), inside of which a magnetic vortex is spinning, and along the generatrix of the toroidal surface - electric vortices.

5. The parallel vortices of one kind are attracted.

6. The mass (energy) of open electromagnetic vortices is uniformly distributed between electric and magnetic vortices, successively overflowing from one species to another.

7. The energy of the internal magnetic vortices of the simples predominates over the energy of their electric toroidal vortices, in proportion to the volume occupied by them.

8. The mass of simples is mainly determined by the energy of its internal magnetic vortex. The density of all simples is the same and is related to the resonant processes that determine the size of the simples. There are five resonance sizes of simples.

9. When the simple-spiral turns into a simple-bagel, the spiral electric vortex is decomposed into torus-shaped electric vortices and an orthogonal azimuthal electric vortex that swirls along the inner circumference of the bagel.

10. Orthogonal superposition of toroidal and azimuthal electric vortices generates an electric charge is generated. In the case of a connection between them, a charge with a "-" sign is generated by the rule of the right-hand drill, and a charge with a "+" sign is generated by the rule of the left-hand drill.

11. The azimuthal electric vortex of simples gives them (generates) a magnetic moment (magnetic vortex).

12. The internal magnetic vortex of the simples, responsible for their mass, gives them spin (a sort of "mechanical moment").

13. Being in a pre-compressed state, as a result of mutual attraction of parallel vortices, the simples possess elasticity. They can be deformed when external forces are applied, and they restore the shape when the external forces are removed.

14. The simple-bagels are stable, the simple-spirale are not stable, but due to the powerful magnetic field at the ends, they are very "active" for folding long block and twisting into simples-bagels (at a sufficient length).

15. When assembling simples into compound aggregates, the "Safety precautions" should be performed. Two simple-spirals with different charges can not join by ends, otherwise short-circuiting of their azimuthal electric vortices will occur. When conjoining two simple-bagels, the directions of their toroidal electric vortices in the conjugation domain must coincide (this point we will discuss in more detail below).

We probably did not provide a complete list of the provisions and postulates of the TEMV. In order to avoid duplication, we also did not give any reasons supporting these provisions and postulates. Some of these arguments are given by us at using these statements and postulates in the course of the presentation of S_theory. In addition, for some of the postulates, we give schemes for experiments to verify them. The main one is the proposed model for the formation of simples, which, in our opinion, can be verified experimentally.

Explanations (by TEMV) to the model of the formation of simple

1. Postulate S_theory number 1 is the fundamental idea of our work. It is on it that the whole building of the S_theory "stands", although in the future, for its "construction," we will have to formulate yet more than one "revolutionary" position (additional postulates).

The postulate No. 1 we propose is considered to be the "first stone" in the foundation of the Theory of Electromagnetic Vortices. True, our "stone" is virtual for now (hypothetical), on the basis of our phenomenological vision of the processes of interaction of electric and magnetic vortices with the use of analogs from classical electrodynamics.

The proposed S_theory is, as it were, a "superstructure" based on the provisions and postulates of the TEMV. Most of them must still be tested experimentally and it is possible to refine their theoretical formulation (the above formulations are mostly phenomenological).

Practical experiments should confirm or disprove the formulated TEMV postulates and, accordingly, strengthen or destroy the foundation of S_theory.

2. The proposed physical model of simples can cause a natural question - why toroidal electric vortices form a toroidal shell of the simple, and not "fluff" into a multilayered "coat", in analogy with classical electrodynamics (see Fig. 1_12).

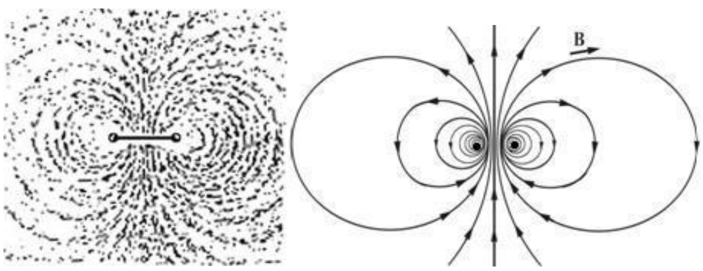


Fig. 1_12. The shape of the magnetic field of the wire turn with current

In the example given, the vortexes were interchanged in places, in comparison with the simple, but, given a certain symmetry of the electric and magnetic fields, the pattern for the magnetic "current" (vortex) should be the same for electric "current" (vortex).

To answer this question, let us turn to the Theory of Air and Hydrodynamic Vortices. Without going into the mathematics of this Theory, we note that the vortices form a flow within themselves, and at a very high flow speeds inside the vortex, it is formed to a dense pipe. A clear demonstration of this process is a tornado (see Figure 1_13).

Fig. 1_13. Tornado - a strong aerodynamic vortex in the form of a pipe

If you could cut out its central part (pipe) from the tornado and close its lower and upper ends, you would get a kind of simple, formed by aerodynamic vortices.

We can assume with great confidence that the velocity of the magnetic and electric vortices of the simple is equal to the speed of light, which ensures the maximum compression of toroidal electric vortices on the toroidal surface of the simple in a kind of pipe.

But in classical electrodynamics, the speed of electric rotors (vortices) is limited by the speed of the electrons in the conductors (forming the rotor), which is limited by many physical effects. As a result, the generated magnetic field is "spread out" over space, rather than going into the "tube".

3. In contrast to aerodynamic vortices and electronic vortices in classical electrodynamics, in which there are energy losses for resistance and radiation, there are no losses in microscopic electric and magnetic vortices. As an example, we can give the electric and magnetic vortices of real photons, which overcome distances of millions and billions of light years. All this speaks for stability and an unlimited time for the existence of simples.

Scheme of experiment on the formation of simples (part 2)

We have already written that recently ideas have been actively developed and experimental attempts have been made to implement the "natural" scheme for the production of first-brick of matter by irradiating a vacuum containing various virtual particles, by a power pulsed field. We also noted that in some ongoing and planned experiments, virtual electron-positron pairs are considered as virtual particles for impact, and a high-power X-ray electron laser is considered as a means of influence. The physics and the expected results of such an experiment are presented in [32, 33].

We remind you that the proposed scheme of the our experiment is different. As virtual particles, we offer "use" virtual photons (which are known to be produced in a vacuum in a large number), and as a power pulsed field use pulsed of a powerful magnetic field. The physics and the expected result of such an experiment (the birth of simples) are described above. In the same place the list of properties of born simples is presented.

For reference, let us clarify again that two different schemes of experiments presuppose the use of different objects of influence (virtual electron-positron pairs or virtual photons), different sources of influence (high-power X-ray electron laser or pulsed of a powerful magnetic field), and what is very important - different types of impact. In the case of virtual electron-positron pairs, it is assumed that they are pumped by the energy of real photons of a powerful X-ray electron laser. Applied to the virtual photons (micro-magnetics with a primary electric vortex) it is assumed that the electric vortex of the VP will be stretched into the spiral by a powerful magnetic field. Real photons do not participate in this process, so the laser source (or some other source of real photons) will not must be used as the source of the force field. As the force field must be used a powerful static magnetic field. The vortex model of this process will be presented by us in Chapter 11 (Unified vortex field theory) and refined in Chapter 15 (the theory of space).

A separate issue - which detectors should be used to detect the formed simples. In this issue, we need to focus on the described properties of simples.

The first is that the simple have an electric charge, the value of which, like the other parameters of the simples, we will be define in the third chapter.

The second is that the mass of simples formed has one unique property: it will decrease for a certain period of time after the formation of the simple, while the process of shortening length of the simple-spirale to a resonant length and twisting him into bagel is in process. This circumstance, when detecting simples with the use of a magnetic field, should lead to the twisting of the tracks of the formed simples in converging conical spirals. It is known that even now, many such tracks are recorded in accelerators, for example, see Fig. 1_14.

And the third is that simples have magnetic moments (magnetic moments of simple-bagels are relatively weak, but magnetic moments of simple-spirals are very strong). These magnetic moments, in conjunction with their electric charges, will lead to the formation of blocks of simples (simpov-bagels - slower, and simplov-spirales - very quickly). The consequences of the formation of such blocks will be discussed in the second chapter, and now I would like to note that the detection of born simples is desirable to be carried out in a "pure" form before the formation of blocks. What, in our opinion, can not be done in accelerators because of the large number of "impurities" - products of the decay of particles. It is hoped that when using the experiment scheme proposed by us, the simple-spirals and simple-bagels will be formed "in a natural way" without the "impurities" of other particles.

Fig. 1_14. Particle tracks in accelerator detectors

In the presented picture, it is easy to see spiral-shaped tracks of particles. Not being specialists in particle detection, we do not know how physicists now interpret these tracks and to which particles they are. Therefore, we do not undertake to specify the requirements for the detectors of symbols. It can only be noted that with a positive result of the experiment on the irradiation of the vacuum and the formation of certain particles, their diversity should not be large. This should facilitate the task of detecting them.

Conclusion of Chapter 1 (Edited by ST2 of 10/28/2017)

In the first chapter of the work we propose a birth scheme and a physical electromagnetic model of simples - the first-brick of matter in the universe.

The Cosmological Concept of S_theory is stated, according to which all matter in all forms and at all stages of its existence consists of three types of electromagnetic vortices: simples of 1 type (or simples), simples of 2 type (virtual photons, real photons, gluons, electron neutrinos and antineutrinos) and simples of 3 type (BH).

From the physical model of simples follows a number of their properties, on the basis of which in the future we will propose S_models of combining simples to basic elementary particles, from which the atoms of matter are constructed.

As a result of the process of birth and shortening of the simples-spirales, we have received the simple-bagels of two standard (quantized) dimensions; the simples-spirales of three standard (quantized) dimensions; the mass of scattered toroidal electric vortices turned into gluons, and small reverse simples which remaining when shortening the simples-spirales in the range of lengths from 0 to L1. As a result simple-gluon plasma was born!

When simulating the process of formation of simples, we stated some new propositions (we called them postulates) of the Theory of Electromagnetic Vortices. The formation of the theory of electromagnetic vortices in its final form still requires large additional theoretical and experimental studies, some of which we will cover in the following chapters.

Chapter 2. S_models of Basic Elementary Particles

On the further order of presentation of the material

A more logical order of the further presentation of the material of our work would be to first determine the parameters of the simples, and then proceed to the construction of S_models of particles.

The reader who read the first chapter of the article probably already tired of the endless descriptions of the processes of formation, transformation and decay of some "mythical" electromagnetic vortexes, moreover, often called the names of known elementary particles.

This can not but cause some rejection. Where the parameters, where the figures, where the calculations, he can ask.

Please patience. The peculiarity of all new physicists is that they are deeper looking into matter, but they can not provide a tool for measuring what they "saw".

The only way to confirm the "seen" is to offer a construction of already known objects of physics from new, newly proposed elements. And only, "having in hand" such a construction, you can conduct the calculation of the parameters of new basic building elements.

Therefore, we first represent the S_models of the structure of the basic elementary particles from the simples, then we describe the process of their formation (S_synthesis) from the basic simples declared in the first chapter, and then we calculate the values of the basic parameters of the simples (mass, dimensions, charges, and so on).

Before the beginning of the description of S_models of the structure of basic elementary particles from simples, one more remark.

At the stage of simple birth, we operated, basically, with their lengths. We remind you that all simples have the same diameter of spirals (= d). Increasing the length of the simple increases their volume, filled with an internal magnetic vortex (stored energy), which, as we "agreed", is responsible for the mass of the simple. Therefore, we will conduct further operations with simples, basically, in terms of mass.

The general order of the further presentation of the material we have determined, and now we will soften it a little. The fact is that constructing S_models from simples, using only the notion that the simple S4 is larger than the simple S3, and the simple S3 is larger than the simple S2, and so on. very difficult. For a meaningful perception of the proposed S_models of particles, one needs to know at least the indicative parameters of the simples.

Therefore, we raise my hand higher and wag it (like a magic wand) and do a summary table of the basic parameters of the basic simples (see Table 1). We will consider the values of the given parameters of the simples as preliminary, subject to further confirmation by means of calculations.

These calculations will be given in the third chapter of our work, after the description of S_models and processes of formation of a neutron, a proton and an electron. In this chapter, called "Calculations of the parameters of simples," we use the S-models and known reference masses of some basic particles (neutrons) to calculate the masses and sizes of the simples, and then, using the S-models of other base particles (protons), we calculate their mass on the basis of mass and the number of simples included in its S-model (proton), and compare it with the reference mass of protons.

The values of the individual parameters of the simples are given in the table at a qualitative level without numerical values (stability, magnetic moment). At the level of the presentation of our work, it is important for us to have these parameters, the calculation of their values is an area for individual studies.

Table. 1. List of basic simples and their basic parameters

The designation of the resonant length of the simple, when describing the quantization (see chapter 1)	L_5	L_4	L_3	L_2	L_1
The old designation of the simple	$S_{5(bag)}$	$S_{4(bag)}$	$S_{3(sp)}$	$S_{2(sp)}$	$S_{1(sp)}$
New designation of the simple	S_{τ}^{-}, S_{τ}^{+}	S_{μ}^{-}, S_{μ}^{+}	S_{e}^{-}, S_{e}^{+}	S_{d}^{-}, S_{d}^{+}	S_{u}^{-}, S_{u}^{+}
The name of the simple	tau_ simple (-/+)	mu_ simple (-/+)	e_ simple (-/+)	d_ simple (-/+)	u_ simple (-/+)
The shape of the simple	torus	torus	spiral	spiral	spiral
Stability of the simple	stable	stable	в свободном состоянии нестабилен, устойчив в блоке спиралей, образующих тор	в свободном состоянии нестабилен, устойчив в блоке спиралей, образующих тор	в свободном состоянии нестабилен, устойчив в блоке спиралей, образующих тор
Mass of the simple (MeV)	7,733128152	0,092914675	0,085166485	0,072133125	0,037926625
Charge of the simple	+/-1/6	+/-1/6	+/-1/6	+/-1/6	+/-1/6
Magnetic moment of the simple	weak, in the center of the torus	weak, in the center of the torus	strong, along the spiral axis	strong, along the spiral axis	strong, along the spiral axis
Length cf. lines of the simple (d)	2275,930452	27,34563997	25,065276682	21,22943945	11,16215315
Length cf. lines of the simple (fm)	1,340978223	0,016112051	0,014768658	0,012508386	0,006576741
Ext. diameter of the simple (d)	725,4511756	9,704387696	-	-	-
Ext. diameter of the simple (fm)	0,427435833	0,005717825	-	-	-
d is the diameter of the body of the torus and the simple-spiral (fm)	0,0005892	0,0005892	0,0005892	0,0005892	0,0005892

We give separately the table № 2 parameters of the inverse simples formed with shortening of simple-spirale in the range of lengths from 0 to L1, from which electron antineutrinos are subsequently formed.

Table. 2. Inverse simples of electron antineutrinos.

The designation of the reverse simple	$\underline{S}_{ev}^{-}$, $\underline{S}_{ev}^{+}$
Name of the reverse simple	the reverse simplex of an electron antineutrino (-/+)
The shape of the reverse simple	torus
Stability of the reverse simple	stable
Mass of the reverse simple, no more	0.00001 (МэВ)
Charge of the reverse simple	(-/+)
Magnetic moment of the reverse simple	weak, in the center of the torus

Notes:

1. Numerical values of the parameters are given with rounding, more precise values will be given in chapter Calculation of the parameters of simples.

2. In the future, when analyzing the geometric parameters of S-models, it will be convenient for us to to measure them in the diameters of the body of the torus (spiral) of simples = d. Therefore, in the table, the geometric dimensions of the simples are represented in both (d) and (fm).

Let us recall once again that the values of the parameters of the basic simples are given in advance, in order to better understand the S_models of basic elementary particles proposed below. After describing the process of formation of basic elementary particles from simples, all numeric values of the parameters of the simples will be calculated.

What is S_model

The main "heroes" of our work are simples (S). Processes and models of the formation of matter from simples we called S_theory.

At the same time, already at the stage of determining the properties and parameters of simples, we constantly analyzed the processes of interaction and transformation of electric and magnetic vortices, from which the simples consist.

Even now, when we have previously determined the parameters of the simples, the construction of basic elementary particles from them will mainly be due to the analysis of the interaction of the electric and magnetic vortices of the simples.

The question arises, from what, in fact, consists of all matter, from simples or from vortices?

The primary in these processes are electric and magnetic vortices, objectively existing and interacting with each other in accordance with certain physical laws.

At the same time, any material object can not be regarded as an unstructured bundle of vortexes connected by electromagnetic bonds. All material objects have a completely definite hierarchical structure of real objects: atoms, their electron shells and nuclei, nucleons, quarks, gluons and ... simples.

The simples in this hierarchical series occupy a very definite place, being in S_theory the minimal possible objects, of which the basic elementary particles and the matter as a whole are composed. Respectively, the construction of the S_model of material objects, we call the definition of the composition and number of simples from which they consist, the relative position of the simples (structure), the electromagnetic bonds between simples that hold them in the given structure, and the identification of electric and magnetic vortices forming the external dipole and magnetic moments of the object.

When building S_models of objects, it is of great importance to analyze the processes of their formation. In the course of these processes, there is a structuring and unification of simples in blocks and aggregates, assembly of blocks and aggregates in the construction of elementary particles, and elementary particles into larger structures (nucleons and nuclei). In this case, the previously existing vortices are modified (folded, merged) and new vortices arise. All this determines the result of the resulting structure and the composition of its external electromagnetic moments.

All these processes have a deterministic character and are the result of the interaction of micro-scopic electric and magnetic vortices of individual simples and structures formed from them. The analysis of these processes, the determination of their stages, the driving electromagnetic forces, possible results we call by constructing an S_model of a particular process.

The construction of the S_model of the object and the S_model of the process of its formation is a single interrelated task and is always solved jointly.

Note:

The construction of the S-model of nuclear and subnuclear objects can be considered as the development of nuclear physics and elementary particle physics.

The construction of the S-model of the processes of formation of nuclear and subnuclear objects is closer to the sections of classical and quantum electrodynamics.

During the construction of S-models, we certainly used the provisions of these sections of physics, where this was possible. However, the vortex structure of the simples and the structures of other objects formed from them is such that, in a number of cases, we did not find any analogs in the known positions of the indicated sections of physics.

Examples are the identification in S_theory of a mass of simples with the energy of their internal magnetic vortices, or the formation of an electric charge by orthogonal electric vortices, and a whole series of new moments, which will be discussed below.

All this, for the time being, is the "fruit" of our phenomenological imagination, is in no way confirmed experimentally, and therefore we had to postulate these moments. Although the proposed postulates allow for variants of their experimental modeling and verification directly or through corollaries arising from S_theory.

S_models of formation of the first basic elementary particles from the simples

Let us recall what the process of the birth of Simples_1 and Simpls_2 of the species, described in the first chapter of the article, have a result, we obtained a simple-gluon plasma consisting of two sizes of simple-bagels (S_5 and S_4), three standard sizes of simple-spirales (S_3, S_2, S_1), the mass of gluons and inverse simple of electron neutrinos.

And one more important result of this moment - at the initial stage of the formation of simples, in the working space of the Big Bang, the SPMF "burned out" almost all virtual photons-micro-magnets, stretching them into simples. As a result of which space became opaque for magnetic interaction. The further appearance of gluons, in the process of shortening the simples, made the space transparent to magnetic interaction at short distances - as a result, long simples twisting into simples-bagels (S_5, S_4), and short simples exist for some time in the form of resonance simples-spirales (S_3, S_2 , S_1), surrounded by a strong magnetic field of gluons. As will be shown later, the density per unit volume of space of short simples-spirales is much smaller than the density of large simple-bagels, and therefore, despite the presence of a strong (but short-range) magnetic field, short simples-spirales meet with each other relatively rarely at this stage.

The number and density in the space of large simple-bagels are much higher, therefore, under the influence of electrostatic (long-range) interaction forces (VF micro-dipoles remained intact during the Big Bang), large simple-bagels with opposite electric charges attract and occur much more often. We are interested in cases when meeting there are large simple-bagels of the same diameter (S_5- and S_5+) or (S_4- and S_4+). Having an opposite charge, they "stick together" with each other, having previously orientated themselves with their magnetic moments, their magnetic moments are combined, and as a result a stable aggregate is formed.

Thus, the process of formation of the first basic elementary particles of matter begins.

What are these particles?

In the general case, the formed micro-particles of two "stuck together" simples-bagels of the same diameter (S_5- and S_5 +) or (S_4- and S_4 +), as well as the micro-particle of the two "stuck together" opposite simples (Sev- and Sev+), we could "come up with" any new names and "assign" them any parameters. However, we are guided by the well-known principle not to "invent" new entities, if it is possible to dispense with existing entities.

Let's try to go this way, choosing for new particles the known family of elementary particles: tau-neutrinos, mu-neutrinos and electron-antineutrinos.

S_model of tau-neutrinos (v_τ)

The S-model of the tau-neutrino (v_τ) is shown in Fig. 2_1. The process of formation of the tau-neutrino occurred immediately after the formation of the S5- and S5 + (according to the new designation Sτ- and Sτ +). These two simples after birth, under the influence of electrostatic attraction forces and magnetic moments in the center of the torus, very quickly "find" each other, pairwise "stick together" and form a stable particle tau-neutrino (v_τ).

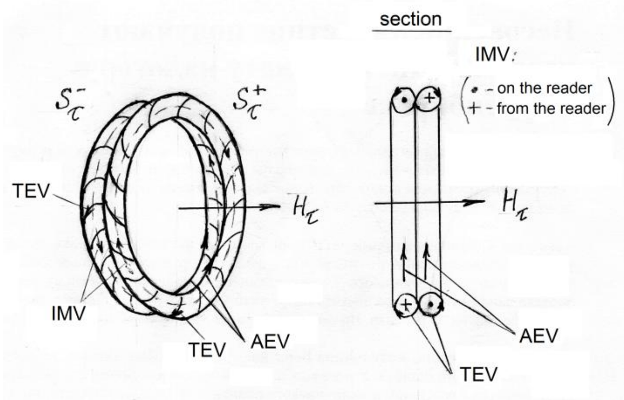


Fig. 2_1. S_model tau-neutrino (the mu-neutrino is the same).

The main role in the attraction and mutual withholding of Sτ- and Sτ + is played by the electric charges of the simples, the magnetic moments of the simples give them the correct orientation at the connection, which ensures the unidirectionality of the toroidal electric vortices at the points (along the line) of contact.

The mass of the tau-neutrino is equal to the sum of the masses Sτ- + Sτ + and, according to the reference data, should not exceed 15.5 MeV.

Tau-neutrino charge = 0, because The charges Sτ- + Sτ + are equal in magnitude and opposite in sign.

The magnetic moment of the tau-neutrino is equals by the sum of the magnetic moments Sτ- + Sτ +.

The outer diameter of the tau-neutrino is equal to the diameters Sτ- and Sτ +.

The diameter of the inner opening of the tau-neutrino is equal to the external diameter minus 2d.

The thickness of the tau-neutrino is 2d.

The Tau-neutrino is stable.

S_model mu-neutrino (v_μ)

The S-model of the mu-neutrino (v_μ) is analogous to the S-model of the tau-neutrino (v_τ), see Fig. 2_1, only the letter "τ" should be replaced with the letter "μ". The process of mu-neutrino formation was similar to the process of formation of tau-neutrinos, only the construction materials for them were the simple-bagels S4- and S4+ (instead Sμ- + Sμ +).

The mass of the mu-neutrino is equal to the sum of the masses Sμ- and Sμ + and, according to the reference data, lies in the range from 0.17 to 0.19 MeV.

The charge of the mu-neutrino = 0.

The magnetic moment of the mu-neutrino is bounded by the sum of the magnetic moments S_μ- + S_μ +.

The external diameter of the mu-neutrino is equal to the diameters S_μ- and S_μ +.

The diameter of the inner opening of the mu-neutrino is equal to the external diameter minus 2d.

The thickness of the mu-neutrino is 2d.

The mu-neutrino is stable.

Note: The reader should remember that the mu-neutrino simple-bagels are the "last" simples-spirales of the minimum length, which are folded into bagels. Shorter simples-spirales lack the length and flexibility to fold into a bagel. Therefore, the radius (diameter) of the inner opening of the mu-neutrino and its simple-bagels is critical. With the "mechanical" compression of the mu-neutrino, its radius decreases less than the critical radius and its simples burst. The bursted mu-neutrino breaks up into two simples-spirales with opposite charges.

S-model of electron-antineutrinos (ve)

The S-model of the electron-antineutrino (ve) is analogous to the S-model of the tau-neutrino (see Fig. 2_2). Only they are formed not from simple-bagels, but from the inverse simples that remain when shortening the simples-spirales in the range of lengths from 0 to L1. The reverse nature of inverse simples (the electric vortex inside, the magnetic vortex around the toroidal surface) is displayed in our notations by a bottom underscore.

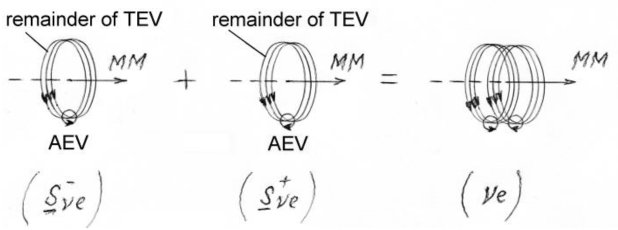


Fig. 2_2. S-model of electron-antineutrinos and electron-neutrinos.

The mass of electron-antineutrinos is equal to the sum of the masses Se_v- + Se_v + and, according to the reference data, should not exceed 0.02 KeV.

The charge of electron-antineutrino = 0.

The magnetic moment of the electron-antineutrinos is summed to the sum of the magnetic moments

Se_v^- and Se_v^+.

The outer diameter of the electron-antineutrino is d (the diameter of the turns of the simples-spirales).

The thickness of the electron antineutrinos has not yet been determined.

The electron-antineutrino is stable.

Result_2: a simple-gluon-neutrino plasma was formed

We state that at the given stage a simple-gluon-neutrino plasma was formed, from which all basic elementary particles of matter are subsequently constructed.

But before proceeding to the description of the stage of synthesis of basic elementary particles of matter, we need to determine the Cosmological model of this process, adopted in S_theory.

Cosmological model of synthesis of elementary particles in S_theory (part 1)

In the Standard Model and Classical Cosmology, the stage of formation of elementary particles is generally called the stage of nucleosynthesis. Our goal is the same, to construct from simples S_ model of nucleons (a neutron and a proton), and, if possible, to explain which design elements give them the ability to strongly interact and form atomic nuclei.

First we want to recall the well-known model of chronology of Cosmological Processes by Andrew Linde [3], according to which:

The first epochs after the Big Bang were: Planck's epoch (0 - 10^{-43} sec), the Epoch of the Great Unification (10^{-43} - 10^{-35} sec) and the Inflationary epoch (10^{-35} - 10^{-31} sec).

If we omit this "exotic", to which we will return at the end of the article, then follow Electroslabaya epoch (10^{-31}- 10^{-12} sec) and Quark epoch (10^{-12} - 10^{-6} sec), at the end of which the Universe was filled with a quark -gluon plasma, leptons, and photons.

Further in chronology A. Linde follows the Andron epoch (10^{-6} - 1 sec), during which follows hadronization (the formation of baryons and antibaryons), violation of CP symmetry, annihilation of baryon-antibaryon pairs, as a result, only "alive" remains a small excess of baryons (about 1: 10^9).

Next comes the lepton epoch (1 sec - 3 min), within which annihilation of lepton-antileptonic pairs (with the same ratio of "living" and "dead") and the decay of a part of the neutrons begins.

And finally, the Proton epoch (3 minutes - 380 thousand years) comes and lasts for a long time, within which the atoms of matter are synthesized, the substance begins to dominate, the universe is filled with hydrogen and helium atoms.

In this Cosmological model, we do not like two things:

a) the fact that in this model an inconceivable amount of matter is burned in the annihilation furnace, with such difficulty (perhaps the only time) appeared "into the light";

b) the creation of all hadrons (including protons and antiprotons), as well as leptons (electrons and positrons) in this model occurs simultaneously, which provokes their annihilation.

According to the Cosmological model adopted in S_theory, we can distinguish the following main stages (phases) in the process of the origin of matter in the Universe (for the point of the report we take the moment of the Big Bang, in the terminology of S_theory - the moment of the burst of the big Black Hole):

1. The birth of simples (stretching into the spiral of electric vortices of virtual photons under the influence of a short-term powerful magnetic field from the burst Black Hole).

2. Quantization (shortening) of the lengths of the simples-spirales, the formation of stable simple-bagels Sτ-, Sτ +, S_μ-, S_μ + and the resonant simples-spirales S_e- and S_e +, S_d- and S_d +, S_u- and S_u +. Formation of a cloud of gluons (flown turns of TEV) and "transformation" of the remainders of the simples-spirales, into the opposite simples S_{ev}- and S_{ev} +. Simple-gluon plasma is formated.

3. Formation of the tau-neutrinos from the simples of the S_τ- and S_τ + , the formation of the mu-neutrino from the simples of the S_μ- and S_μ + , the formation of electron-antineutrinos from the "remnants" of the simples-spirales, shortening to zero (the reverse simples of S_{ev}- and S_{ev} +). Simple-gluon-neutrino plasma is formated.

4. The first stage of nucleosynthesis is the formation of the relict neutron (nr).

5. The second stage of nucleosynthesis is the decay of the relict neutron into a proton, electron, and antineutrinos.

6. The third stage of nucleosynthesis - nr_nucleosynthesis of the spectrum of element isotopes.

The presented ST_Cosmological model differs significantly from the model of Cosmological processes of Andrew Linde. Although, between the epochs of Andrew Linde and the stages of the ST_Cosmological model, we can note a certain correlation (similarity), though the "filling" of these epochs and stages, at first glance, is completely different. Let us explain these differences and similarities in more detail.

First: the Planck era and the era of the Great Unification in the chronology of Andrew Linde in the Cosmological model of S_theory are equivalent to the process of the birth of virtual photons in space and the formation of a primary black hole. This stage goes beyond S_theory and refers to the Physics of Space (Fourth Physics). S_theory is related to the Third Physics, the subject of which are nuclear and subnuclear particles and processes. This division is fundamental in our opinion, therefore it is better to consider them separately, which we will do in the special chapter "Fourth Physics".

Second: Further on Linde follows the Inflationary era. In the interpretation of S_theory, it corresponds to the stage of the birth of simples, and more specifically to the stage of the stretching of the virtual photons under the influence of the SPMF in the simples-spirales (the stage S_ of the synthesis of the simples).

This correlation is rather "courageous", but let's imagine if the distance in the space between the VP is much smaller than the average size of the born simples-spirales, then the stage of the birth of simples should lead to the formation of a "superhard body" consisting of the simples-spirales of different orientations and different lengths, tightly pressed together. Moreover, the formation of this "superhard body" should go with a superluminal speed, because the propagation of SPMF proceeds at the speed of light, and additionally this process is "superimposed" by the process of "swelling" (increasing the length) of the simples-spirales and "repelling" of the simples-spirales with different orientation of each other. It is precisely the different orientation of the simples-spirales that prevents them from interacting, all the more so because the VP-micro-magnets (transmitting the magnetic interaction), almost all turned into simples-spirales and at the first moment the carriers of magnetic interaction disappeared.

The "productive" result of the interaction of the simples-spirales can begin only after the "superhard body" will expand in the surrounding space and the stage of shortening (quantization of lengths) of the simples-spirales begins, as a result of which gluons will appear.

In fact, the stage of the formation of "superhard body" and its expansion in the surrounding space is the process of the transition of matter from the superdense state to the state of "normal" density.

Third: Further (according to Linde) +Electroslobaya and Kvarka era followed. In S_theory, they correlate with the second stage - Quantization of lengths (shortening) of simples-spirales, the formation of resonance- spirales and simple-bagels, the creation of neutrinos.

The process of shortening the simples-spirales is accompanied by the production of gluons, as a result, instead of a quark-gluon (according to Linde) plasma, a simple-gluon plasma is formed (according to S_theory).

Against the birth of photons (according to Linde) at this stage, there is no objection in S_theory. Below, when analyzing the process of annihilation of the simples with opposite charges, photons will be born in large numbers (Relict Radiation).

But to the birth of leptons (electrons and positrons, according to Linde) at this stage in S_theory of the attitudes is twofold.

On the one hand, at this stage, this "in principle" can occur, for this, in the spectrum of simples there are Se- and Se +. The attentive reader has already paid attention to the value of the parameters of these simples and realized that if the six simples-spirales Se- or six simples-spirales Se + , under the influence of their strong magnetic fields, are assembled into simple-bagels, then these blocks can collapse into simples, which by charge, mass and other the parameters will correspond to the electron and positron.

On the other hand, electrons in the required quantity will be produced during the decay of relict neutrons into a proton and an electron. We are in favor of this particular version of the formation of electrons that make up the substance.

Where did the simples-spirales Se- and Se +" formed at the previous stage disappear? Why they did not gather in blocks of 6 pcs. and they did not generate electrons and positrons?

The fact is that at this stage the temperature of the Universe (simple-gluon plasma) is very high, which is expressed in the high kinetic energy of all simples. This temperature (kinetic energy) does not allow the simples-spirales Se + and Se + to form blocks of 6 pieces. Blocks of a given length immediately disintegrate under the impact (blows) of other simples-bagels.

Below, we construct a graph of the dependence of the permissible length of blocks of unipolar simples-spirales on temperature (Cosmological stages). From it will be seen that the possibility of forming blocks of 6 pcs. the simples-spirales of the Se-and Se + appears only at the stage of decay of relict neutrons. And now all the simples-spirales Se- and Se + formed have to annihilate with each other, they have no other option.

In fact, the process of annihilation of the simples-spirales Se- and Se + looks more diverse, because in it, there participate other short simples (Su and Sd), but these are "details", which we will discuss below. At the same time, not all short simples-spirales "burn in the furnace" of annihilation, some of them (Su + and Sd-) participate in the construction of the S_construction of relict neutrons.

With regard to the annihilation of the simples-spirales Se- and Se + , the reader may object: - authors themselves were against the annihilation of the particles that were born, and then immediately burned all the simples-spirales Se- and Se + in the "furnace" of annihilation.

But there is nothing scary with that. First, the number of electrons we need will be born in the decay of relict neutrons (when the temperature decreases and the 6 piece simples-spirales Se- can form a single block and twisted into an electron-bagels). Secondly, positrons (formed from 6 pieces of simples-spirales Se +) for the formation of matter are "not needed" (in the Universe there are very few of them and all of them are produced in subsequent reactions of capture or beta decay of isotopes). Thirdly, the originally born simples of Se- and Se + are only 0.006% of the total mass of matter in the Universe (we will present this in Chapter 12). So, the "loss" of the originally born simples-spirales Se- and Se + in the "furnace" of primary annihilation is "not great" and will not affect the subsequent formation of matter.

The simples-spirales Sτ- and Sτ +, as well as the simples-spirales Sμ- and Sμ + , twisted into bagels, successfully survive this stage and in the next stage from them tau-neutrinos and mu-neutrinos are formed, which are the main "building material" (by mass) for relict neutrons.

The fourth (ST-Cosmological model differs from the model of Cosmological processes by Andrew Linde): Following the formation of neutrinos, the stage of relict nucleon formation begins. This stage according to S_theory, on the one hand, corresponds to the Hadron epoch (according to Linde), on the other hand it is fundamentally different from it.

In S_theory, protons are not produced simultaneously with neutrons (although their internal structure of the simples differ very "slightly" (very soon we will present you the S_model of neutrons and protons).

First of all, neutrons are formed according to S_theory (we called them relict and denoted nr) - this is the first stage of nucleosynthesis, and then their decay into protons and electrons from which hydrogen atoms are formed is the second stage of nucleosynthesis. Well, after that, the third stage of nucleosynthesis begins - nr_nucleosynthesis, in the course of which the relict neutrons are sequentially attach to the nucleus of the hydrogen atom (proton) and to form of a complete spectrum of isotope nuclei.

Such a "scheme" for the formation of nucleons and electrons provides a "guaranteed" equality of the number of protons and electrons formed.

Fifth: The newly introduced Fourth difference a priori introduces an asymmetry in the formation of matter and antimatter in our universe, which is explained by the initial formation of only relict neutrons and the complete absence of relict antineutrons necessary for the formation of antiprotons and positrons.

The asymmetrical nature of our universe is explained by the fact that negative simples-spirales in it are born initially longer than positive ones. This is due to the mutual orientation of the magnetic moments of the VP and SPMF at the time of the birth of the simples. VP, whose magnetic moment coincides with the magnetic moment of the SPMF, stretch longer and have a negative charge, while the VP, whose magnetic moment has the opposite direction with the magnetic moment of the SPMF, stretch out shorter and have a positive charge (see Fig. 1_5).

The resonant lengths of the same negative and positive symbols are the same. This circumstance leads to a difference (asymmetry) in the number of positive and negative simples at the beginning and at the end of the spectrum of their lengths, as shown in Fig. 2_3.

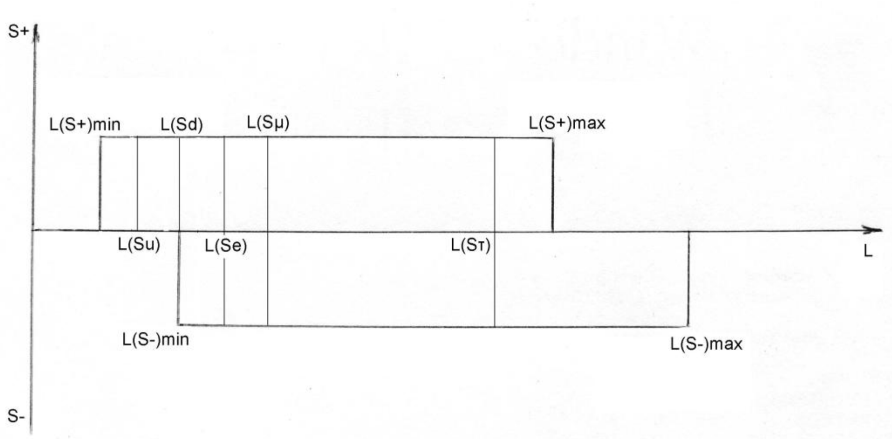


Fig. 2_3. Spectrum of the births of simples.

The lack of negative simples at the beginning of the length spectrum leads to the complete absence of the formation of the simples Su- , the existence of which we have so far theoretically stated, but in fact, which are absent. In the presence there are only simples Su +, participating in the formation of relict neutrons, but the absence of simples Su - makes it impossible to form relict antineutrons and antimatter as a whole. In more detail, the rationale for this provision will be given later, and in Chapter 12 we will estimate the number of sims of all kinds formed in some test space volume. Based on this calculation, we will determine how many simples of each type went to the formation of matter, and how many remained "out of work" and went to the formation of Dark Matter.

Now for us it is important that the absence of simples Su - did not allow the relict antineutrons to form at the stage of nr_nucleosynthesis corresponding to the Hadron epoch. Thus, the formation of antimatter in the universe was prevented.

Strong readers can object to us that antiprotons, antielectrons (positrons), and, apparently, antineutrons are actually fixed in experiments. There is nothing surprising in this, in the process of constructing S-models of nucleons and various nuclear reactions, we will meet positrons and "peculiar" antiprotons, but we can not say anything about antineutrons.

Note:

All of the above does not mean that there is no antimatter in Nature. It is, and very much - the whole Universe, and it was formed on the other end of the blasted Black Hole, where the SPMG had the opposite direction of the magnetic moment. Accordingly, all the processes of formation of simples there walked "on the contrary." As a result, in the second Universe the spectrum of the lengths of positive and negative simples is inverted, with all the ensuing consequences. We will examine in greater detail the question of the formation of the Anti-Universe and its possible interaction with our Universe in Chapter 13.

Sixth: The last stage of nucleosynthesis (nr_ nucleosynthesis of the spectrum of isotope nuclei) has a prefix (nr_) , it means that the entire process of primary synthesis of all isotopes was walking a sequential addition of relict neutrons to the nuclei of previously formed isotopes, namely:

A) a relict neutron was added to the proton (the nucleus of the hydrogen atom 1H), the nucleus of the deuterium atom (2H) was obtained,

B) a relict neutron was added to the nucleus of the deuterium atom, which then decayed into a proton and an electron, and as a result, the nucleus of the helium-3 (3He) atom,

B) the relict neutron was added to the nucleus of the helium-3 atom, the core of the helium-4 (4He) atom was obtained, and so on.

This scheme for the synthesis of the spectrum of isotope nuclei allows one to synthesize the entire spectrum of atoms of elements in homogeneous process, including behind the iron atom. This scheme additionally speaks about the special properties and special role of relict neutrons in the initial synthesis of the spectrum of atoms of elements. The difference of relict neutrons from "modern" standard neutrons, as well as the difference in reactions of nr_nucleosynthesis from modern reactions of thermonuclear fusion, we will discuss in more detail in the following chapters.

In accordance with the presented S_Cosmological model, we will continue our consideration of the formation of elementary particles of matter from simples. But at the first, we consider the admissible and non-admissible versions of the conjugation of simples in S-models.

"Safety" of assembly of simples in S_model:

Safety assembly of simples are some conditions (requirements) for permissible and not allowed connections of simples in blocks and other aggregates. We called these requirements conditionally "Safety engineering" (SE).

The main requirement of SE is the absence of a "short circuit" (SC) of electric vortices (meeting them "forehead"). One example of this requirement we have already cited:

1) We are talking about a unidirectional conjugation of toroidal electric vortices when unipolar tau- and mu-simples are combined into tau- and mu-neutrinos (see Fig. 2_1). The fulfillment of this requirement in this case is ensured by the "correct" orientation of the simples with respect to each other in conjugation. This is ensured by their magnetic moments, which have different orientations relative to the toroidal electric vortices of simples with different charges.

By the way, this situation is also observed when the electron and positron are combined into electron-positron pairs. According to S_ theory, electrons and positrons in the state of bagels and at their low-energy state are not annihilated.

2) According to the S_ theory of annihilation, only the simples-spirales or the blocks consisting of simples-spirales having opposite electric charges are affected. In this case, the magnetic fields of the simples-spirals are oriented in such a way that their azimuthal electric vortices are directed to meet each other. When such simples-spirals are conjugated, there is a short circuit of azimuthal electric vortices (a kind of micro-explosion), leading to the annihilation of the simples-spiral, see Fig. 2_4 (a). In more detail, the process of annihilation of simples-spirals with opposite charges and its consequences will be described later when analyzing the decay of relict neutrons.

According to this scheme, an electron with a positron annihilates at their high-energy encounter, which results in the bursting of the bagels of electron and positron and "short circuit" of azimuthal electric vortices of simples-spiral with opposite charges.

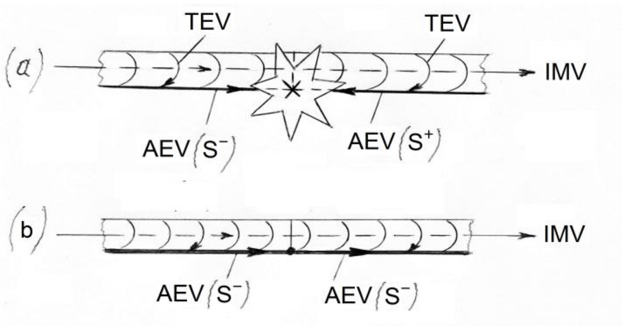


Fig. 2_4. The result of connecting the simples-spirales with different and identical electric charges.

3) A completely different result is obtained when meeting the simples-spirales with the same electric charges. Under the influence of a powerful magnetic field, they are also attracted by opposite magnetic poles, but in this case the direction of their azimuthal electric vortices at the junction of the simples-spirales will coincide. As a result, they will unite without problems into a single helix, unless the impact of the external environment (high temperature) prevents them from doing so, Fig. 2_4 (b). Under high temperature, we always understand the high kinetic energy of the simples, which, when colliding with other simples, does not allow them to form to too large blocks (breaks them)

4) Another unacceptable version of the conjugation of the simples can be the penetration of simple into the gap between the two ends of a simples-spirales, filled with a powerful internal magnetic vortex of these simples (Fig. 2-5). As a result, the simples

that fall into the powerful magnetic vortex of another simple (or two other simples) are "burned" and burst with a destructive effect on the surrounding simples (micro-explosion).

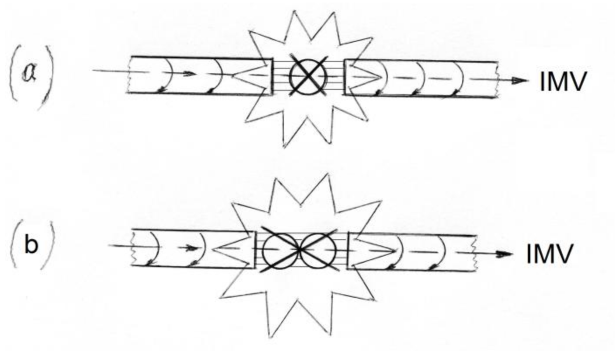


Fig. 2_5. "Burning" simple in the gap between two other simples.

The given variants of permissible and not permissible conjugation of simples are the basis of "Security" for building S_models of all nuclear and subnuclear objects from simples.

S_construction (S_model) and process of synthesis of relict neutron from simples

After the formation of all types of neutrinos, we have the following building material (the "set of weights") necessary for the construction of the S-model of the neutron: it is a tau-neutrino, a mu-neutrino, two standard sizes of simples-spirales Sd-, Su + and gluons. The other simples-spirales and electronic antineutrinos in the "construction" of the relict neutron do not participate.

S_construction of the relict neutron from this "set of weights" (S_model of a relict neutron) is shown in Fig. 2_6.

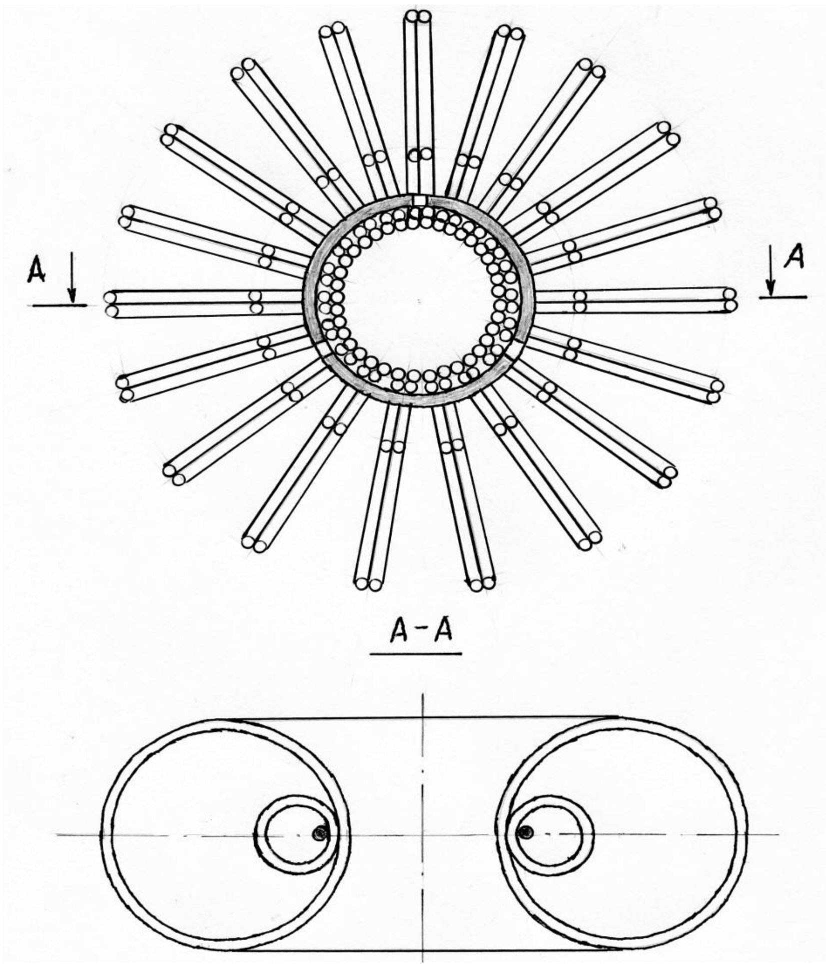


Fig. 2_6. S_model of the relict neutron.

In the figure, the number and dimensions of the S_ elements of the relict neutron are depicted conditionally. A 3D view of the relict neutron in the axonometry is shown in Fig. 2_14.

The process of relict neutron formation

The most active role in the process of formation of relict neutrons is played by the simples-spirales Sd- and Su +, or rather their powerful magnetic fields. Thanks to them, they are actively looking for partners, only the result of such meetings is different. If there are simples-spirales with opposite charges, at the point of contact of the simples-spirales there is a short-circuit of multidirectional azimuthal electric vortices (annihilation). In simples-spirales with the same charges, the direction of the azimuthal electric vortices at the point of contact coincides and they form a single block.

Simples-spirales of Sτ and Sμ curled into bagels by this time, combined in pairs with opposite charges, forming electrically neutral tau-neutrinos and mu-neutrinos with very small magnetic moments formed by the azimuthal electric vortices of the simples Sτ and Sμ . It is thanks to these magnetic moments that they are also included in the process of building relict neutrons.

The process of synthesis of relict neutrons went in four stages, see Fig. 2_7.

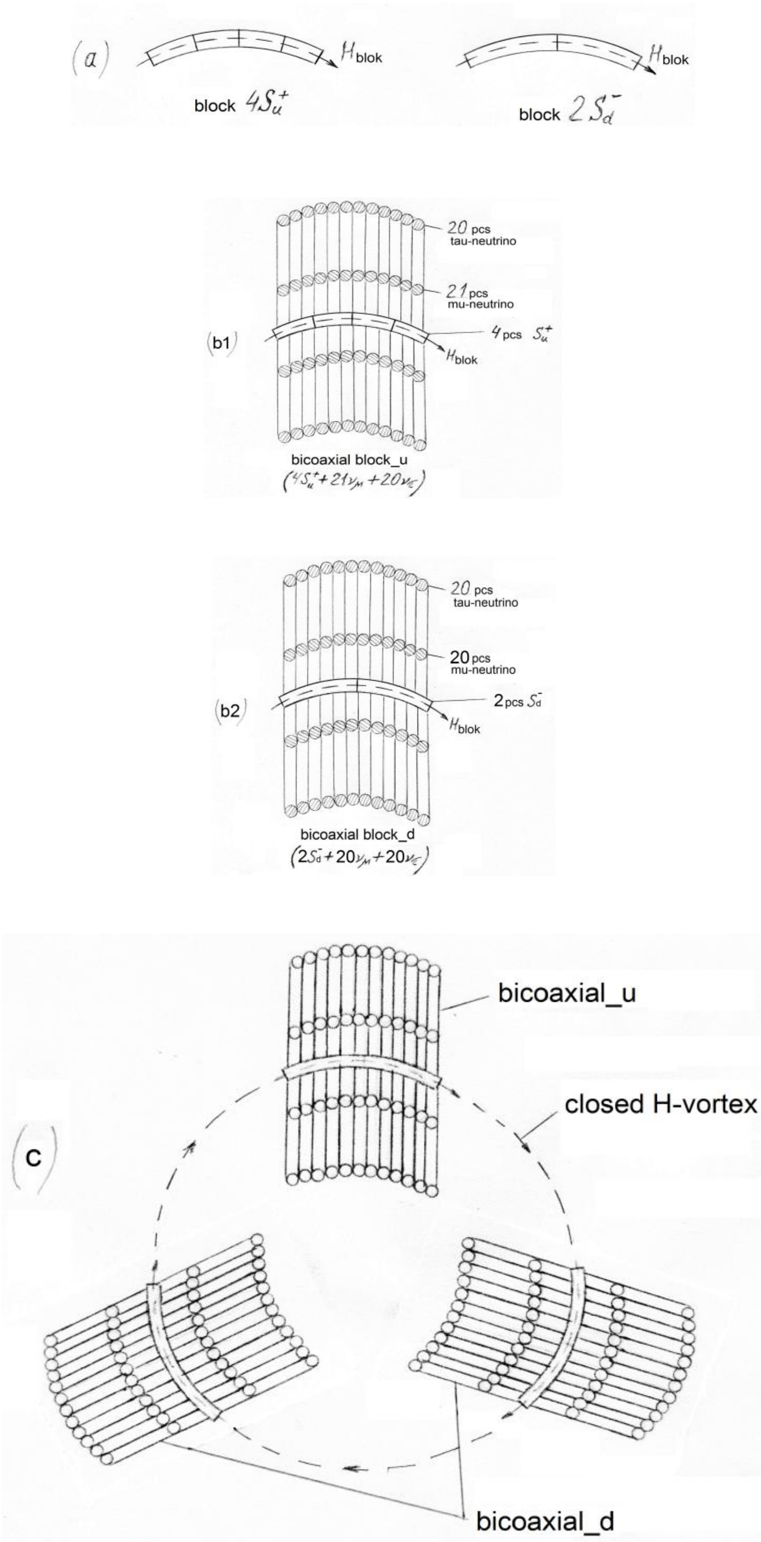


Fig. 2_7. S_model of the relict neutron synthesis process

At the first stage, under the influence of magnetic attraction, the same-name blocks of two simples-spirales Sd- (with a block charge = -1/3) were formed and blocks of four simples-spirales Su + (with charge of the block = +2/3). These blocks have approximately the equal length 42.46 (d) and 44.65 (d). Hereinafter, as the unit of measurement of linear dimensions, we shall use the value d - the diameter of the electric vortex of a virtual photon (the diameter of the body of a torus or of simple spiral).

Longer blocks from the simples-spirales of the same name Sd- and Su + probably also "tried" to form, but under the influence of high temperature (strong "Brownian" motion) immediately disintegrated.

Multipolar blocks of Sd- and Su + symbols could not be formed, because at them in the junction points there is a short circuit of azimuthal electric vortices (AEV), which leads to the annihilation of simples (the process of simples annihilation will be considered below).

Under the action of the magnetic attraction forces of the ends of the 2Sd- and 4Su + blocks, the blocks to bent into an arc (with an internal angle of 120 °), but could not twisted into a bagel, the total length and flexibility of the blocks did not suffice, see Fig. 2_7 (a).

In the second stage, the blocks 2Sd- again under the influence of magnetic forces "put on themselves a double coat" of 20 mu-neutrinos and 20 tau-neutrinos, and the 4Su + blocks "put on themselves a double coat" from the 21 mu-neutrinos and 20 tau-neutrinos, which, as you remember, have their own magnetic moments. As a result, bent blocks-bicoaxials (2Sd- + 20νμ + 20ντ) and (4Su + + 21νμ + 20ντ) were formed, see Fig. 2_7 (b).

The number of clothed mu-neutrinos and tau-neutrinos roughly corresponds to the length of the 2Sd- and 4Su + blocks. The larger (by one) number of mu-neutrinos, clading in 4Su + blocks, is explained by their longer length (just about 2d). An equal number of tau-neutrinos clading in 2Sd- and 4Su + blocks is explained by the much diameter of the tau-neutrino bagels and the much larger distance of the tau-neutrino bagels from the 2Sd- and 4Su + blocks.

In the third stage, these blocks-bicoaxialy first under the influence of long-range forces of electrostatic attraction became close, and then, under the influence of magnetic forces, they sorted and assembled three blocks-bicoaxial in the following composition:

(2Sd- + 20νμ + 20ντ) + (4Su + + 21νμ + 20ντ) + (2Sd- + 20νμ + 20ντ)

As a result, they formed an electrically neutral bicoaxialy toroidal aggregate, see Fig. 2_7 (c). At this stage, the central parts of blocks (2Sd-, 4Su +, 2Sd-) still do not reach each other, because So far they are on the axial lines of the bicoaxialy toroidal aggregate.

Note: Another variant of the composition of the unit aggregate of three bicoaxialy blocks is possible:

(4Su + + 21νμ + 20ντ) + (2Sd- + 20νμ + 20ντ) + (4Su + + 21νμ + 20ντ)

But it could not form, this would be hampered by long-range forces of electrostatic repulsion between two blocks (4Su + + 21νμ + 20ντ), having charges of +2/3 each. A block (2Sd- + 20νμ + 20ντ) with a charge of -1/3, joining one of them, can not compensate for their positive charges.

For the same reason, toroidal aggregates of three identical bicoaxialy blocks could not come together.

In the fourth step: central blocks (2Sd-, 4Su +, 2Sd-) in the resulting bicoaxialy toroidal aggregate under the action of a powerful magnetic attraction forces began to attract each other and form a torus own, consisting of three fragments. Since the total length of these three fragments was significantly shorter than the length of the midline diameter of bicoaxialy toroidal aggregate, our new torus (2Sd- + 4Su ++ 2Sd-) during its compression starts moving toward the inner diameter of the toroidal aggregate, i.e. on the "bottom" of the torus, formed by bagels of tau-neutrinos, tightly pressing them against each other. "On the way" our new torus (2Sd- + 4Su ++ 2Sd-) also captured bagels mu-neutrinos and pulled off the whole aggregate strong internal toroidal hoop. The resulting aggregate is the S_construction of the relict neutron, which we have already shown in Fig. 2_6. In Fig. 2_14 S_ The design of the relict neutron is represented in 3D-axonometry, though without "internals" (mu-neutrinos and "quark hoop").

In the future, this central "hoop" of three fragments of the simple-blocks (2Sd-, 4Su +, 2Sd-) will be called the "quark hoop", the total length of which is:

2 * 21,229 + 4 * 11,162 + 2 * 21,229 = 129,566 (d)

We draw your attention that the circumference of 60 beads of tau-neutrinos, tightly pressed together, is equal to 120d (along the middle line), and the circumference of 61 beads of mu-neutrinos is 122d (along the midline).

The length of the "seats" of these structural elements of the relict neutron is equal to the length of three concentric circles, separated by a distance of 1d along the radius, which is 120d, 126,283d, 132,566d, respectively.

As you can see, beads of tau-neutrinos are tightly pressed to each other (120d = 120d), mu-neutrino beads (122d) are relatively freely placed on their "seat" of 126.283d length. And the total length of the three fragments of the "hoop of quarks" (129,566d) is exactly 3d less than their "seat" with a length of 132.566d.

From this it follows that between the "quark hoop" fragments there are gaps of 1d, which guarantees a tight screed of the entire aggregate and the absence of short-circuit faults of the azimuthal electric vortices of the blocks of the simples-spirales that enter the "hoop of quarks" and have opposite charges.

The aggregate charge of the "aggregate" is zero, which indicates the absence of electrostatic antagonisms in the process of "assembling" the relict neutron.

This is the process of "assembling" (formation) of the relict neutron is completed.

Nine questions

A separate explanation in the proposed design of a relict neutron requires the following questions:

1) Explanation of the number of bicoaxial blocks for building a relict neutron (3 pieces).

2) Explanation why other compositions of blocks of short simples-spirales "do not participate" in the assembly of a relic neutron.

3) Explanation of the number of Sd- and Su + in fragments of the "hoop of quarks" (coefficients 2 and 4).

4) Explanation of the number of tau-neutrinos (60 pcs.).

5) Explanation of the number of mu-neutrinos (61 pcs.).

6) The reason for the absence of a short-circuit between the fragments of the "quark hoop". The transmission scheme (closure of the contour) of azimuthal electric vortices in the fragments of the "quark hoop".

7) Verification of the estimated mass of the relict neutron, as the sum of the masses entering into it simples.

8) The dipole moment of the relict neutron.

9) What in the proposed design of the relic neutron is the quarks u and d?

On the first question (the number of bicoaxial blocks for building a relict neutron):

One or two arc-shaped blocks (120° each) would not be sufficient to form a toroidal "aggregate". Four or more blocks would be redundant. The toroidal "aggregate" could only be formed from three blocks.

Here it is necessary to give the necessary Remark on the dependence (correlation) of the angle of bending of arc-shaped blocks and the simples of the helices (the coefficient of flexibility of the symbols) on their length and temperature of the Universe (S_Cosmological stage).

We have already voiced the following corners of different arc-shaped objects (simples):

1) Mu-simple-spirale have length ~ 27d at the stage of quantization of lengths of simples convolve safely in simple-bagel (arc angle = 360^{o}).

2) Short simples-spirales Su (~ 11d), Sd (~ 21d), Se (~ 25d) at the same stage (quantization of lengths of simples) alone can not twisted into bagels (lack of flexibility, i.e little length).

3) As we suggested, at the stage of formation of relict neutrons, the blocks 4Su (~ 44d) and 2Sd (~ 42d) form arc-shaped spiral blocks (the arc angle of which is ~ 120°), but for some reason they can not curdle in a bagel, although shorter ones mu-simple-spirale (~ 27d) safely curled into bagels.

4) At the stage of formation of blocks of short simples-spirales, the two Se-simples-spirales can not even make up the 2Se block (50d) -the block is scattered by the temperature (impacts from the Brownian motion of the particles), but at the stage of the decay of the relic neutron, the six Se-simples-spirales (~ 150d) safely forms and twisted into an electron bagel (360^o).

The presence of some contradictions in the given data is explained by the different temperature of the Universe at different stages of the S_Cosmological model of the Universe development and, accordingly, by the different flexibility of the simples.

At the stage of quantization (shortening) of the lengths of simple-spirales, the temperature of the Universe is high, conditionally T1o, with her simple-spirales length ~ 27d and more are twisted into simple-bagels. Coefficient of flexibility of simple = Lmin / d = ~ 27.

In this case, the short simple-spirales are bent into arcs by an intrinsic magnetic field: Su (~ 11d) = ~ 147^o; Sd (~ 21d) = ~ 279^o; Se (~ 25d) = ~ 330^o.

At the stage of formation of blocks of short simple-spirales, the Universe temperature dropped conditionally to $T2^o$ and the 2Sd (~ 42d) block formed an arc of ~ 120^o, i.e.

coefficient of flexibility of the simple = Lmin / d = (~ 42d) * (360^o / 120^o) / d = ~ 126. The 4Su block have all about the same.

The arc of single simple-spirale at the same time decreased:

Su (~ 11d) = ~ 30°; Sd (~ 21d) = ~ 60°; Se (~ 25d) = ~ 71^o.

At the stage of decay of relic neutrons, the temperature of the Universe has still dropped conditionally to $T3^o$ and the 6Se-block is twisted into a donut 360^o, i.e. the arc of one simple-spirale Se (~ 25d) = 60^o.

Coefficient of flexibility of simple = Lmin / d = (~ 25d) * (360^o / 60^o) / d = ~ 150.

From the given data, it is possible to compose the dependence of the coefficient of flexibility of the simples on the temperature of the Universe at the appropriate stage, see Fig. 2_8.

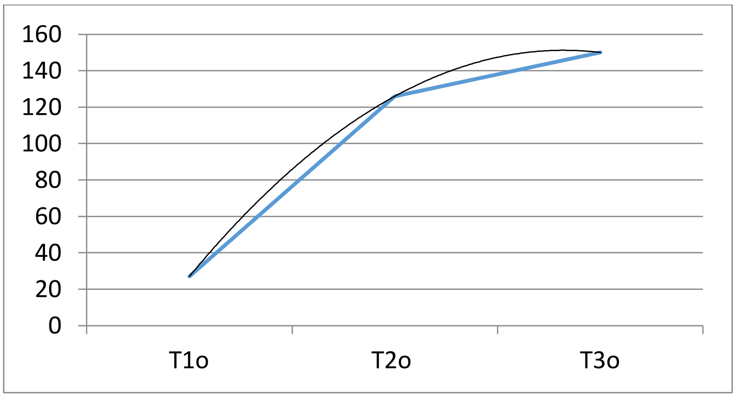


Fig. 2_8. Dependence of the coefficient of flexibility of the simples-spirales from temperature of the Universe (S_Cosmological stage)

From the definition, the coefficient of flexibility of the simples (K) it follows that its value is equal to the minimum length of the simple-spirale that can twisted into a simple-bagel.

If the temperature intervals ($T1^o$-$T2^o$) <= ($T2^o$-$T3^o$), then on the basis of the trend line of the graph it can be assumed that the last value of the coefficient of flexibility of the sleeper simples (~ 150) has been preserved up to our Cosmological epoch.

On the second question (the composition of blocks of short simples-spirales):

When assembling the relict neutron, we used only two types of blocks, based on the following two combinations of short simples-spirales:

2Sd- (42,458d, -1/3) (1)

4Su+ (44.648d, +2/3) (2)

However, this is not a complete set of possible combinations of short simples-spirales, the length of which is approximately 1/3 of the total length of the "seat" for the "hoop of quarks" of the three blocks (132,566d). Ten more options are theoretically possible:

blocks with negative charge:

2 * Su- + Sd- (43.553d, -1/2) (3)

4Su- (44,648d, -2/3) (4)

Sd- + Se- (46.294, -1/3) (5)

2 * Su- + Se- (47,389, -1/2) (6)

2Se- (50,131, -1/3) (7)

blocks with positive charge:

2Sd+ (42,458d, +1/3) (8)

2 * Su+ + Sd + (43.553d, + 1/2) (9)

Sd+ + Se+ (46,294d, +1/3) (10)

2 * Su+ + Se + (47,389, +1/2) (11)

2Se + (50.131, +1/3) (12)

Especially it is necessary to talk about additional options allocated in bold type: 4Su- (44,648d, -2/3) and 2Sd+ (42,458d, +1/3).

They theoretically provide an opportunity for the formation of relic antineutrons, but according to S_theory this option is not possible. The reason for this is again in the asymmetry of the formation of positive and negative simples, the internal magnetic field of which is directed differently with respect to the external magnetic field (SPMF) at the stretching of virtual photons (VP) into simples-spirales.

Let us analyze the process of stretching the electric vortex of the VP into simples-spirales of additionally.

S-model of the stretching of the electric vortex of the VP in the simple-spirale

In Chapter 1, when formulating Postulate No. 1, which establishes the result of the process of stretching the VP in the form of a simple-spirale, we put in analogy to this process a known physical experiment of the motion of an electron into a magnetic field along a spiral.

Comparison of these processes (analogy) is purely conditional. In the case of VP, we are not talking here about a moving electric charge (electron), but about a stationary electric vortex, so this process must be modeled separately.

About a closed electric vortex, we only know that it is a closed electric vortex. What is there in it "spinning" and under the influence of what "strength" we can only "guess". Without going into the details of the "course of our thoughts", we will refer readers to the chapter "Fourth physics - the physics of space", in which we simulate the process of "birth" (formation) of virtual photons in space. Our model of the birth of the VP assumes participation in this process certain set of elements (corpuscles) of space, each of which contributes to the formed electric vortex of the VP. The electric VP vortex in this model is formed as a super wave - accidental coincidence of phases of a set of corpuscles. Taking into account the permissible little difference between the phases of corpuscles, their "collective labor" in the formation of a vortex, one can imagine in the form of a set of compressed turns together, similarly to a compressed spring.

Let us ask ourselves, why does the intrinsic magnetic field of the VP do not stretch the spring of the electric vortex of the VP into a spiral, similarly, as it does under the action of SPMF? What keeps them? In accordance with the theory of springs, the answer to this question may be the presence of a barrier force of stretching the spring in a free state. This means that in order for the electric vortex (spring) to begin to stretch into a spiral, some barrier force (Fbar) must be applied to the spring. Before reaching an external force of this value (Fbar), the spring does not stretch. When the external force exceeds this value (Fbar), the spring begins to stretch and the value of the increase in the length of the spring (L-Lo) will be proportional to the excess force over the barrier force (F - Fbar); see the standard force and stretch length diagram for springs in Fig. 2_9 (a). In our case Lo can be considered equal to zero, such a diagram is shown in Fig. 2_9 (b).

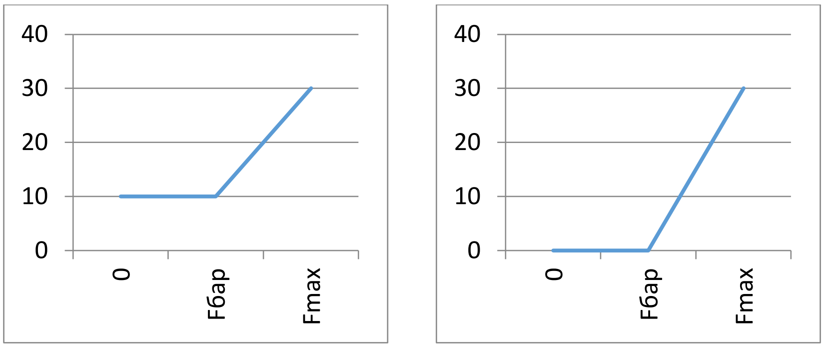


Fig. 2_9. The standard diagram of the forces and lengths of stretching of spring
Lo = 10 on the graph (a), Lo = 0 on the graph (b)

If the electric vortex of the VP had no such barrier stretching force, then its own magnetic field of the H_{VF} would stretch the VP into a spiral without any help from the external magnetic field of the SPMF. We denote the Hbar value of the external magnetic field, which creates an effort to stretch the electric vortex VP equivalent to Fbar.

But in our case, in addition to the initial barrier force, we still have an internal magnetic field of the electric vortex, which also prevents the stretching of the electric vortex of the VP (in the case of positive simples), and promotes stretching (in the case of negative simples).

As a result, positive simples will begin to stretch only when the external magnetic field (proportional to H_{SPMF} * cosα) is completely compensated for by the internal magnetic field of the electric vortex of the VP, plus the overcoming of the barrier force of the "spring" stretching (Hbar).

$H_{SPMF} * \cos\alpha_0 = H_{VF} + Hbar$,

where α_0 - is the angle of orientation of the magnetic vortex of the VP with respect to the H_{SPMF}, at which stretches of positive symbols begin (in the range α from + 90° to + 270°).

At this moment, the electric vortex of the VP begins to stretch into a positive simple-spirale from zero length and up to some L + max corresponding to α = + 180°. In Fig. 2_10 shows a diagram of this process.

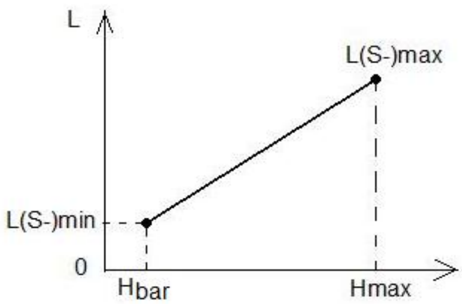


Fig. 2_10. Stretching diagram of positive simples (the values of the stretch are conditional)

Another picture is obtained with negative simples. They H_{VF} does not prevent stretching, but until a certain time, and does not help, until H_{SPMF} * cosα compensates for Hbar. Their stretching will begin from the moment of overcoming the barrier force of stretching the electric vortex of the VP (H_{VF}).

H_{SPMF} * $\cos\alpha_0$ = Hbar,

where α_0 - is the angle of the beginning of the stretching of negative simples (in the range from + 90 ° to -90 °).

The internal magnetic field is not necessary to overcome, it will on the contrary contribute to the stretching process, but only after the external magnetic field compensates the barrier force. Therefore, the process of stretching the VP to negative simple begins abruptly at a specified moment from the stretching of the VP to a certain minimum length L-min corresponding to the HVF, see the diagram in Fig. 2_11.

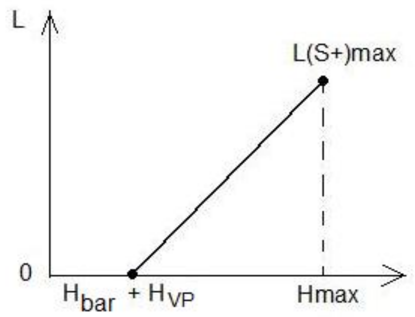


Fig. 2_11. Stretching diagram of negative simples
(the values of the stretch are conditional)

In Chapter 12 it will be shown that the L-min corresponding to the HVF is slightly larger than L (Sd), i.e. falls directly into the range of lengths from L- (d) to L- (e). All negative simples-spirales, falling in this range of lengths, are shortened to the resonance length Ld.

In this way (according to S_theory), the simples-spirales of S- (u) are not formed at all and we "safely" avoid the variant of the formation of relic antineutrons, with their subsequent disintegration into antiprotons and positrons and complete (or almost complete) annihilation of matter, as in classical physics.

As a result, additional variants of negative blocks under numbers 3, 4, and 6 can not be formed.

Charge of relic neutron

Another target parameter of the composition of the triad of blocks of the "hoop of quarks" of the relic neutron is the zero total charge (relic neutron should be neutral).

In the absence of the block 4Su- , five more variants of combinations of triads of bicoaxial blocks satisfy this requirement:

(1) + (2) + (5) → L = 133.4d

(1) + (2) + (7) → L = 137.237d

(5) + (2) + (5) → L = 137.228d

(7) + (2) + (7) → L = 144.91d

(5) + (2) + (7) → L = 141.073d

As you can see, all these variants have the total length of three fragments of the "hoop of quarks" greater than the length of the "seat", equal to 132.566d and therefore can not be the basis of the relic neutron.

All other variants of the selection of the triad of fragments of the "hoop of quarks" do not give zero total electric charge, and therefore also are not acceptable for building a relic neutron.

For objectivity, it should be noted that in addition to the relic neutrons, many other variants of toroidal aggregates (pseudo nucleons) from the set of blocks of short simples-spirales, as well as mu-neutrino and tau-neutrino bagels, can certainly be "designed" in general form, but only their parameters , charge, dimensions) will be completely different than for a relic neutron, and hence standard protons and electrons can not form from them in the course of their β-decay.

The fate of these "pseudo-nucleons" we will discuss in the 12th chapter, devoted to Dark Matter and Dark Energy. In the same place, we will talk about the ratio of the number of short simples-spirales that went into the formation of relic neutrons, annihilated during the encounter of positive and negative simples-spirales, and those remaining in the composition of the Dark Matter.

On the third question (the number of Sd- and Su + in fragments of the "hoop of quarks"):

In this issue we are talking, in fact, about the size of the charge of simples. We have already determined (postulate No. 4) that the electric charge is the result of the presence in the simples of the azimuthal electric vortices and their interaction with other vortexes of simples.

Now let's ask ourselves: is the size of the simple charge dependent on the length of the simple or not?

We will not bore you with an analysis of this question, there are arguments, both in that and in the other direction. It is necessary to declare the postulate No. 5:

The magnitude of the electrical charge of all the simples is equal to -1/6 or +1/6 of the electron charge. The sign of the charge is determined by the mutual direction of the azimuthal and toroidal electric vortices.

It would seem that it was more logical to choose the values of the charge of simple equal to -1/3 and +1/3 (then the number of simples in the fragments of the "hoop of quarks" would be 1Sd- and 2Su +). But, as will be shown in the S_ analysis of the decay scheme of the relict neutron, the emerging electron is formed from the bursting simples Sμ- . And, if the charge Sμ- would be equal to -1/3, then for the formation of an electron three Sμ- would be required, and its mass would be approximately equal to three masses Sμ-, i.e. 3 * 0.092914675 = 0.278744025 MeV, which is approximately half the mass of the electron.

When the simple charge is postulated to be 1/6, six Sμ- will be required to form an electron, the mass of which will be 6 * 0.092914675 = 0.55748805 MeV, which, after subtracting the "scorched" sections of the simpleы Sμ-, closely corresponds to the reference mass of the electron equal to 0, 51099891 MeV.

Accordingly, for the formation of the central "thread" d_quark, we need 2 pieces. Sd- (to get a charge equal to -1/3), and for the formation of the central "thread" u_quark we need 4 pieces. Su + (to get a charge equal to +2/3).

On the fourth question (quantity ντ = 60 pcs.):

You must remember that we have adopted a scheme for constructing particles of matter from a set of "weights" of different masses. Weighing the goods always begin with large weights. The largest weights in our set are tau-neutrinos. Let us determine how many " weight" tau-neutrinos (ντ = 15,4662563 MeV) can fit into the reference neutron n_{ref} = 939.5653782 MeV:

number of ντ = INTEGER (n_{ref} / ντ) = 939,5653782 / 15,4662563 = INTEGER (60,75) = 60 pcs.

Here, it can be noted that in the reference proton, exactly 60 pieces of tau-neutrinos are also stacked:

number of ντ = INTEGER (p_{ref} / / ντ) = 938,272013 / 15,4662563 = INTEGER (60.67) = 60 pcs.

And the number of tau-neutrinos can not be less than 60 pieces because then the remainder of the mass of the nucleons must then be covered by a very large number of mu-neutrinos, and then no "digestible" S_ nucleon structure is produced (but no one weighs it so, replacing the large weight with a bunch of small ones).

This amount of tau-neutrinos is strung (like beads) into three fragments of the "hoop of quarks" of approximately equal length and having approximately equal magnetic moments, i.e., respectively. 20 pieces each for each fragment (as we indicated earlier).
Considering that each tau-neutrino consists of two simples with a bead diameter equal to d, the total size of the "packet" of 60 beads of tau neutrinos will be 120 (d).

Note: We specified the specified amount of tau neutrinos by the "weighing" method, in other words, "selection". This method gives an unambiguous amount of tau-neutrinos, but in reality it was, of course, determined by the magnetic and temperature conditions for the formation of bicoaxial blocks. We do not have the data to conduct such a calculation, so we are satisfied with the "selection" method.

On the fifth question (quantity νμ = 61 pcs.):

Beads of mu-neutrinos have the same thickness (d) as well as beads of tau-neutrinos and fragments of "quark hoop". The mu-neutrino beads are located between the "quark hoop" and the 60th bag of tau-neutrinos, tightly pressed together and having a circumference of the "seat" along the midline of 120d. It is not difficult to calculate that the length of the "seat" for mu-neutrino bagel along the middle line will be 126.283d, and the length of the" seat "for the" hoop of quarks "along the middle line will be 132.566d.

The length of fragments of the "quark hoop" is of decisive importance in determining the number of mu-neutrinos. In the proposed model, the fragments of the "hoop of quarks" 2Sd- have a length L = 42,46d and will "dress" themselves with 20 pcs. mu-neutrino, and longer fragments of the "hoop of quarks" 4Su + have a length L = 44.65d and will "dress" themselves on 21 pieces. mu-neutrinos.

The total size of the "package" of 61 pcs. mu-neutrinos will be 122 (d) and they fit freely in their "seating position" - a circle with a length of 126,283d.

However, the question arises why the fragment 2Sd- (L = 42,46d) did not "put" on itself 21 pcs. mu-neutrinos (its length allowed it to be done), and the fragment 4Su + (L = 44.65d) did not "put" on itself 22 pieces. mu-neutrino (its length, too, allowed it to be done)?

The fact is that in this case the total size of the "packet" from the mu-neutrino would be 64 pieces, and the total length of the packet of beads of the mu-neutrino would be 128 (d) and it would not fit in its "seat" "- a circle with a length of 126,283d. In this case, the mu-neutrino beads would have to "pile up" on each other, stretching the "quark hoop". The gaps in the "hoop of quarks" would increase to 2d (this is easy to calculate), and in such a gap one of the mu-neutrinos easily fails out into the gap between the fragments of the quark hoop and burns out and their total number would decrease to 63 pcs.

But 63 pcs. mu-neutrinos also can not constitute a total "packet" of mu-neutrinos. In this case, when assembling the bicoaxial blocks (fragments), symmetry would be completely unjustifiably broken-for every fragment of the "quark hoop" would have to "dress" 21 pieces mu-neutrino, which would not be proportional to the length of the fragments 2Sd- (L = 42.46d) and 4Su + (L = 44.65d).

Due to the symmetry breaking, the total number of mu-neutrinos can not equal 62 pcs. This amount can not be divided proportionally to the length of two fragments of 2Sd- (L = 42,46d) and one fragment of 4Su + (L = 44.65d).

And only 61 mu-neutrinos can be distributed along the fragments of the "hoop of quarks" in proportion to their length, fragments of 2Sd- (L = 42,46d) "clothed" themselves 20 pieces each. mu-neutrino, and the 4Su + fragment (L = 44.65d) "clothed" itself on 21 pieces. mu-neutrinos.

This ratio of the lengths of the fragments of the "hoop of quarks" and the number of mu-neutrinos was determined, of course, not by the "notorious" symmetry (although it has a very large value in the micro world), but by the interaction of magnetic moments and lines of force of "hoop of quarks" fragments and mu-neutrinos. "Superfluous" mu-neutrinos that hang or are located at the very edge of the fragments of the "hoop of quarks" are simply "pushed out" by magnetic forces from the resulting bicoaxial blocks.

Perhaps the second, geometric explanation of the maximum number of mu-neutrinos is 61 pieces. We "cutting" for one fragment of the S-model of relic neutron, in the region of one fragment of the "hoop of quarks", see Fig. 2-12.

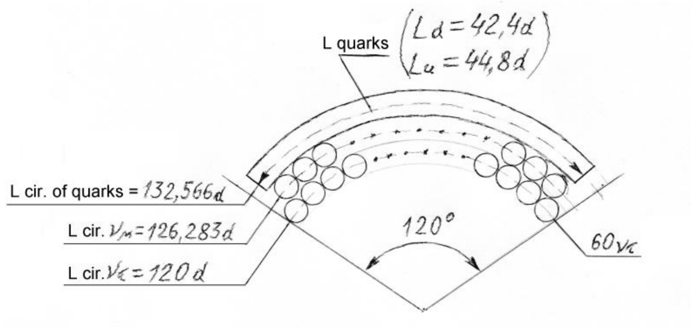


Fig. 2-12. Calculation of the number of mu-neutrinos in a relic neutron

Readers should remember that the fragments of the "hoop of quarks" have the shape of an arc of the order of 120 °. At the same time, the seat for the mu-neutrino contracts with respect to the seat of the "hoop of quarks" with a coefficient K = 126.283 / 132.566 = 0.9526. Recalculating the average length of the fragments of the "hoop of quarks" to the average length of the center line of the mu-neutrino seat, we obtain the following values:

Lmid of fragment (2Sd-) = 42.46 * 0.9526 = 40.45 (d) - which corresponds the maximum number of mu-neutrinos is 20 pcs.

Lmid of fragment (4Su +) = 44.65 * 0.9526 = 42.53 (d) - which corresponds the maximum number of mu-neutrinos is 21 pcs.

The total maximum number of mu-neutrinos in a relic neutron is 61 pcs.

True, there is some "suspicion", that 61 mu-neutrinos somehow quite "freely" (with gaps) are located in their seat. The sum of all the gaps between the mu-neutrinos is 126.283 - 122 = 4.283d. But, as will be shown later, "swing" of mu-neutrinos in its seat with gaps is the "natural" state of the mu-neutrino, because the main "mission" mu-neutrinos in the nucleons is to burst in the process of various nuclear reactions, as a result of which the gaps between them are constantly increasing.

The idea that the mu-neutrino will be bursted entering the nucleons, just stated in the process of various nuclear reactions, is one of the "cornerstones" in the "foundation" of S_theory. With this idea in mind, the total number of mu-neutrinos in protons and neutrons (not relic neutrons) that make up the isotopes can only decrease, reaching its minimum quantity of 9 pcs. per nucleon in the region of isotopes located around the 56Fe isotope. In the 56Fe isotope itself, all nucleons contain 9 pcs. mu-neutrinos (3 pcs. for each fragment of the "quark hoop"). This minimum quantity supports the toroidal form of "hoop quarks" and does not allow to break down slit magnets, which will be discussed in the analysis of the sixth issue.

Thus, we determined the maximum number of mu-neutrinos in a relic neutron equal to 61 pieces.

And what prevents him from being less than 61 pcs?

We will answer this question in more detail later. In a "two words" it will be that in S_theory the mass defect in all nuclear reactions is strictly calculated and physically realized through the break off mu-neutrino, which is precisely for this purpose "intended" and is the "expendable" material of all nuclear reactions.

So, running ahead, we will say that the standard (reference) neutron contains 60 pcs. mu-neutrino, and in the standard (reference) proton there are 53 pcs. mu-neutrinos. It is at these mu-neutrino quantities that the sum of the masses of all the simples that make up the standard (reference) neutron and the standard (reference) proton ideally coincide with their reference masses.

The reference neutron is formed from the relic neutron upon its addition to the proton (in the process of formation of the deuterium nucleus). Wherein as in all nuclear reactions, at least one mu-neutrino must burst. So the relic neutron must contain a minimum of 61 pcs. mu-neutrinos.

At us the minimum has converged with a maximum on quantity of a mu-neutrino equal 61 pieces. So the relic neutron contains 61 pieces. mu-neutrinos.

A consequence of the idea of mu-neutrino bursting.

According second law of thermodynamics to there is an irreversibility of basic physical processes. The bursting of mu-neutrino in nucleons is a confirmation of this law. This irreversibility of nuclear reactions is the basis (physical meaning) of the physical parameter-time, and explains its one-pointedness.

More details on the relationship of time and physical processes, we'll talk in the chapter "Fourth Physics".

On the sixth question (the scheme for closing the azimuthal vortices):

At the first stage of neutron synthesis, we noted that opposite simples can not be assembled in one block, because there will be a short circuit of azimuthal electric vortices (AEV). However, at the fourth stage of relic neutron formation, their fragments of the "hoop of quarks" consisting of the multipolar (Sd- and Su+) simples, are attracted to each other, forming a single "hoop" ("quark hoop"), but for some reason it does not reach the short-circuit of AEV(?)

We have already disassembled this problem, we repeat it in stages: the first stage is the initial moment immediately after docking the three bicoaxial blocks into a single unit, the second stage is the process of attracting fragments of the "hoop-quarks" to each other and "flying" to the bottom of the torus (The surface of the inner volume of the relic neutron torus), the third stage is stationary, when the fragments of the" quark hoop "sank to the bottom and formed a single "hoop ".

At the first stage, three fragments of the "hoop of quarks" are located along the middle line of the formed torus (bagel) of the neutron and "do not reach out" to each other (Fig. 2_7c). There is no danger, the azimuthal electrical vortices of the fragments of the "quark hoop" closes via garlands of gluons.

In the second stage, three fragments of the "hoop of quarks" begin to attract each other with their magnetic fields, the gaps decrease, three fragments gradually descend to the "bottom" of the bagel and become a single "hoop of quarks" (see Figure 2-6). However, the gaps between the fragments of the "hoop of quarks" do not completely disappear, (they are equal to 1d). The second stage is completed, go to the third stage.

The third stage fixes this "quark hoop" position, in which a guaranteed gap of 1d = (132.566d - 129.566d) / 3 is formed between two adjacent fragments of the "quark hoop".

This means that with the size of simples, declared by us, the fragments of the "quark hoop", dropping to the bottom of the neutron torus, do not reach each other (there are still gaps of 1d) and a primitive short-circuit AEV can not occur.

But then a new question comes up, - but how do the AEV chains of each fragment of the "quark hoop" close? After all, the magnetic vortices of the fragments of the "quark hoop" have gathered in a single closed magnetic vortex and he no longer needs garlands of external micro-magnets from gluons. What can not be said about the azimuthal electric vortices (AEV) of fragments of the "quark hoop". They had previously closed through garlands of external VP micro dipoles from the side of the inner arc of fragments of the "quark hoop". But when AEV "lay down" on the "necklace" of mu-neutrinos, the place for the garland of external VP micro-dipoles disappeared. This is clearly seen in Fig. 17c. In addition the closure of the AEV through the external resonance circuit could not last forever. Sooner or later, the energy reserve in the resonant circuit would end.

Therefore, when the "quark hoop" is at the bottom of the neutron torus, the AEV begins to look for another circuit to close their vortices and must be find it! The new track is very "curve". The azimuthal electric vortices of the fragments of the "quark hoop" first find unidirectional toroidal electric vortices mu-neutrinos , and flow over them into unidirectional toroidal electric vortices tau-neutrinos. And then they return to the beginning of the fragment of the "quark hoop" along the wavy chain of toroidal electric vortices of tau-neutrinos (Fig. 2_13), and flow back to the "quark hoop" around the toroidal electric vortex of the mu-neutrinos.

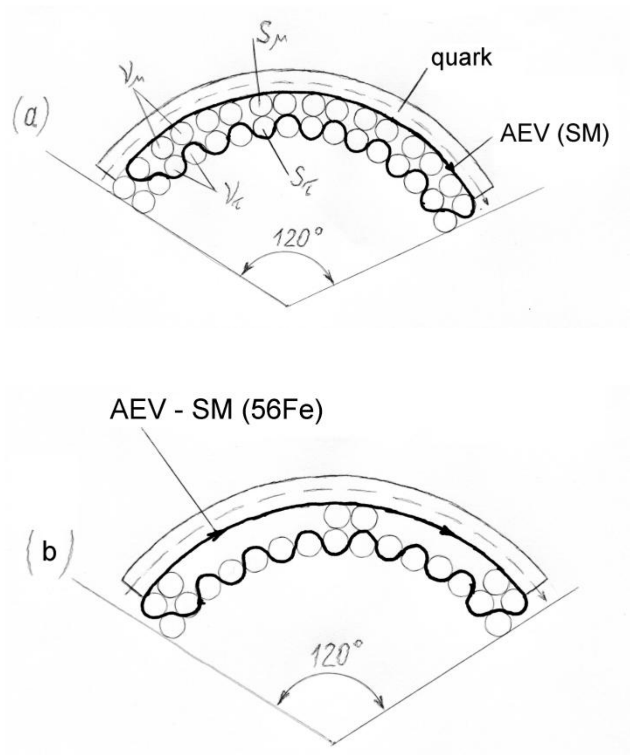


Fig. 2_13. Slit magnets: (a) - with the maximum number of mu-neutrinos, (b) - with the minimum number of mu-neutrinos in the nucleons of the 56Fe isotope

We call this combination of vortices slit magnets. In total, in the relict neutron, three slit magnets formed each adjacent to 0ne "quark hoop" fragment. The role of slit magnets of the nucleons is very significant, it will be further shown that they are the basis of the forces of strong interaction between nucleons (see the Synthesis of isotopes).

Note: The flow of azimuthal vortices from the "quark hoop" around Sμ (mu-neutrino) to Sτ (tau-neutrino) should occur as close as possible to the ends of the "quark hoop" fragments (to the gaps). Therefore, the optimal arrangement of the mu-neutrino relatively the fragments of the "quark hoop" is the arrangement in which at each end of each fragment of the "quark hoop" one mu-neutrino is located, as shown in Fig. 2_13 (b). In addition, the middle of the fragments of the "quark hoop" should "support" one more mu-neutrino, otherwise the fragment of the "quark hoop" will "sag" and the shape of the slit magnet will be violated, and the azimuthal electric vortices may closed up.

The smaller the mu-neutrino remains in the slit magnet, the more flagellums of gluons it can to join and the stronger its magnetic effect will be. This means that the maximum binding energy of nucleons in an atom will correspond to the minimum number of mu-neutrinos in all nucleons of the atom, i.e. at 9 pcs. mu-neutrinos per each nucleon (three fragments of the "quark hoop" and three mu-neutrinos in each fragment). And the isotope consisting entirely of nucleons containing 9 pieces each. mu-neutrinos should have a maximum binding energy of nucleons, i.e. is the 56Fe isotope. We will verify this assertion when we perform the S-calculation of all the reactions nr-nucleosynthesis of the spectrum of isotopes.

As a result, we can note that the "Safety" in the submitted S-model of the relic neutron is fully observed, all the vortices have found their places in the general S-structure of the neutron, all the vortices are closed and no cataclysms have no place to be.

On the seventh question (the mass of the relic neutron):

Above we have already cited the general formula of the bicoaxial toroidal "aggregate" from which the neutron was formed:

(2Sd- + 20νμ + 20ντ) + (4Su + + 21νμ + 20ντ) + (2Sd- + 20νμ + 20ντ)

We simplify this formula and get: ($60\nu\tau + 61\nu\mu + 4Sd- + 4Su +$)

We calculate the mass of the relic neutron in this S-model:

nr (ST) = 60 * 15.46625630 + 61 * 0.18582935 + 4 * 0.072133125 + 4 * 0.037926625 = 939.75120755 MeV

which does not correspond to the reference mass of the neutron:

n (ref) = 939.5653782 MeV

We calculate the difference in the masses of the relic neutron according to the S-model and the reference mass of the neutron:

nr (ST) - n (ref) = 939,75120755 - 939,5653782 = 0,18582935 MeV = mass 1 pcs. mu-neutrino (!)

As we see, the difference in the mass of the relic neutron from the reduced S-model and the reference mass of the neutron is equal to the mass one mu-neutrino. It would seem that we need to throw out one mu-neutrino from the S-model relic neutron model (make all the fragments of the "hoop of quarks" containing 20 mu-neutrinos) and everything will be fine, but not everything is so simple!

The visionary reader probably already realized that the S-model of the relic neutron and the mass of simples were originally calculated on the basis of the total number of mu-neutrinos equal to 60 pcs. and was equaled the reference mass of the neutron. And then, for some reason, another mu-neutrino was added to the S_model of the relic neutron and they became 61 pcs., especially since one longer fragment of 4Su + allowed it to be done. Why do we need a relic neutron with an additional mu-neutrino?

The fact is that according to the Cosmological conception adopted in S_theory, neutrons and protons were born not simultaneously, but consistently:

Stage 1 - relict neutrons were formed (we are now analyzing this process with you).

Stage 2 - the process of disintegration of relic neutrons into protons and electrons began.

Stage 3 - with the advent of the first protons, when most of the relic neutrons have not yet disintegrate, the process of nucleosynthesis of isotope nuclei from protons and relic neutrons begins and the successive formation of the nuclei of all isotopes begins.

A detailed S-analyses of the processes taking place at the 2 nd and 3 rd stages will be considered below. Now, we just note that these processes have one common binding element. This is a mandatory mass defect in all nuclear reactions.

It is known from the Standard Model (SM) that the sum of the particle masses on the left side of the nuclear reaction equations is always greater than the sum of the particle masses on the right-hand side of the equations (the mass defect is always negative - the total mass of the particles decreases).

We will not give known formulas and calculations, we note only one paradoxical fact of this regularity.

For the ß-decay of the neutron, n → p + e- + v or d → u + e- + v, the heavier particles turned into lighter ones (everything is normal).

For K-capture, for example, 33Na + e- → 32Ne + v, the mass calculation of isotopes gives a negative mass defect (everything is normally), but the calculation at the quark level u + e- → d + v gives a positive mass defect (?).

The same is obtained when all the ß+_decays of isotopes are calculated.

In SM, this paradox is explained by the fact that in addition to particles in the course of nuclear reactions, the mass of the gluon cloud also changes (incidentally, gluon is massless particles, according to SM). Although they are massless, but they change the binding energy of particles, and the binding energy contributes to the mass of the particle. And this means that if, as a result of the reaction, the sum of the masses of the particles in the equation at the quark level becomes larger, then the binding energy on the contrary becomes smaller, and the mass defect again becomes negative. Here is a such theory SM, and it is called the single law of conservation of mass and energy.

In S_theory, the approach to the problem of the mass defect is other:

1. Speaking about the mass of the simple, we mean the energy of its internal closed magnetic vortex (for brevity - the internal energy of the simple) and vice versa.

It is the internal energy of the simples that is released under various nuclear reactions, creating, as follows from postulate No. 3, the corresponding defect of the masses participating in particle reactions.

2. It is believed that the law of conservation of mass and energy should be fulfilled at all levels - both at the level of isotopes, and at the level of nucleons, and at the level of quarks, and at the level of simples.

3. The mass defect in all nuclear reactions is always negative, which is ensured by a universal "expendable material" in which the role of the mu-neutrino is. In other words, the total number of mu-neutrinos for all nuclear reactions always decreases only and can not increase.

This statement can be written as the next postulate No. 6 of the S_theory. In the future, we will use and test it when analyzing all nuclear reactions.

It is in accordance with this postulate that we "needed" a relict neutron containing on one mu-neutrino more than reference neutron.

Let us illustrate the effect of postulate No. 6 on two examples:

1) As will be shown below, the S-model of proton is formed from the S-model of the relic neutron by bursting the 8-mu-neutrino and replacing the two fragments of the "quark hoop" (2Sd-, 2Sd-) on (2Sd-, 4Su +). The resulting proton formula in the simples can be written as:

($60\nu\tau$ + $53\nu\mu$ + 2Sd- + 8Su +).

Let us check the calculated mass of the proton according to S_theory:

60 * 15.46625630 (3) + 53 * 0.18582935 + 2 * 0.072133125 + 8 * 0.037926625 = 938.272013 MeV

It turned out to be equal to the reference mass of a proton, determined by the mass of the nuclei of hydrogen atoms [4].

2) Mu-neutrinos burst not only in the transformation of the relic neutron into a proton, but also in the reactions of nucleosynthesis of nuclei of other isotopes, in particular, when a relic neutron is added to a proton and the deuteron is formed. In this reaction, the relic neutron remains a neutron, but as a result of nucleon compression by forces of strong interaction, one mu-neutrino bursts in the relic neutron. The resulting formula for the resulting neutron will look like this ($60\nu\tau$ + $60\nu\mu$ + 4Sd- + 4Su +). Count the mass of the resulting neutron:

60 * 15.46625630 (3) + 60 * 0.18582935 + 4 * 0.0772133125 + 4 * 0.037926625 = 939.5653782 MeV

It corresponds to the reference mass of the neutron, determined by the method of measuring the difference in the masses of the nuclei of hydrogen and deuterium atoms [4].

Thus, we can state that the relic neutron is a neutron formed after the Big Bang in the first stage of nucleosynthesis from the tau-neutrino (60 pcs.), the mu-neutrino (61 pcs.), the block 2Sd- (1 pcs.) and the blocks 4Su + (2 pcs.). Briefly, its formula can be written so (60-61- (2-4-2)), and even more briefly nr(61).

In the next stage of nucleosynthesis, the relic neutron decays and turns into a reference proton (the nucleus of the hydrogen atom) with the formula (60-53- (4-4-2)), or p(53).

At the next stage, the synthesis of isotope nuclei begins, at which the relic neutron participates in the synthesis of the nuclei of the atoms following hydrogen, and first of all, in the synthesis of the nucleus of the deuterium atom, becomes a reference neutron with the formula (60-60- (2-4-2)) or n (60).

From all of the above, we can draw two conclusions.

Conclusion 1:

The reader, who knows the masses of the isotope nuclei and their mass defects in comparison with the sums of the reference protons and reference neutrons entering into the isotopes, should have already understood that in the subsequent reactions of the synthesis of the isotope nucleus spectrum, an entirely different number of mu-neutrinos bursted! And, that the protons and neutrons produced in these isotopes have, respectively, a different number of mu-neutrinos left in them! And, that the reference masses of the proton and neutron known to you are only related to the proton in the hydrogen atom and to the neutron in the deuterium atom!

It turns out that the mass of nucleons in the composition of isotopes is a variable:

A) for protons, the mass varies from 938.272013 MeV (53 mu-neutrino) to 930.0955216 MeV (9 mu-neutrinos in each nucleon in the nucleus of the 56Fe isotope);

B) for neutrons, the mass varies from 939.5653782 MeV (60 mu-neutrino) to 930.08808135 MeV (9 mu-neutrinos in each nucleon in the nucleus of the 56Fe isotope).

It is of some interest that the minimum masses of protons with 9-mu-neutrinos and neutrons with 9-mu-neutrinos are very close to each other (almost equal).

Conclusion 2:

The above term "nr-nucleosynthesis of the spectrum of isotope nuclei" is not a random play of words and symbols - it means that the initial synthesis of the spectrum of isotope nuclei was walking the successive addition of relic neutrons to the nuclei of lighter atoms, starting with the proton - the nucleus of the hydrogen atom, etc.

This approach makes it possible to explain why, after the synthesis of iron atoms, the curve of the binding energy of nucleons in an atom bends downward, and the synthesis of subsequent isotopes (zinc, silver, gold, etc.) continues.

The fact is that the binding energy of nucleons in atomic nuclei is the energy of attraction of the above described gap magnets of different nucleons interacting with each other through magnetic flagellums formed from gluons. The force of attraction (binding energy) of the slot magnets depends on the number of mu-neutrinos that have bursted (the number of holes in the slit magnet).

Therefore, for the synthesis of atoms behind the iron atom (in which the number of mu-neutrinos per nucleon dropped to a minimum of 9 pcs.), a pumping of "nuclear fuel" with a sufficient number of mu-neutrinos is necessary. This role is played by relict neutrons, maximally saturated mu-neutrinos, and the process of nr-nucleosynthesis does not stop. As a result, nr-nucleosynthesis continues until complete exhaustion of relic neutrons.

This is the result of S_theory.

The process of nr-nucleosynthesis of the entire spectrum of isotope nuclei will be discussed in more detail in a separate chapter.

On the eighth issue (the dipole moment of the relic neutron):

Magnetic moments of tau-neutrinos and mu-neutrinos played a role in the assembly of bicoaxial aggregates in the formation of a relic neutron and after the formation of a "hoop" of quarks, it would seem that their role is "exhausted" and can be "forgotten" about them. But this is not so.

In the final design of the relic neutron, the azimuthal electric vortices of the tau-neutrinos and the mu-neutrinos did not disappear anywhere, and hence their magnetic moments also continue to exist. At the same time, they all lined up along two circles - the inner central circle of the torus-like aggregate formed by the 60th tau-neutrino, and the inner central circumference of the torus-like aggregate formed by the 61st mu-neutrino. In fact, two new magnetic vortices have formed, having the same direction of "rotation". According to all the laws of electrodynamics, these new magnetic vortices must generate a new electric vortex passing through the central point of the relic neutron orthogonally to the plane of circles formed by the magnetic moments of the tau-neutrinos and the mu-neutrinos (see Fig. 2-14).

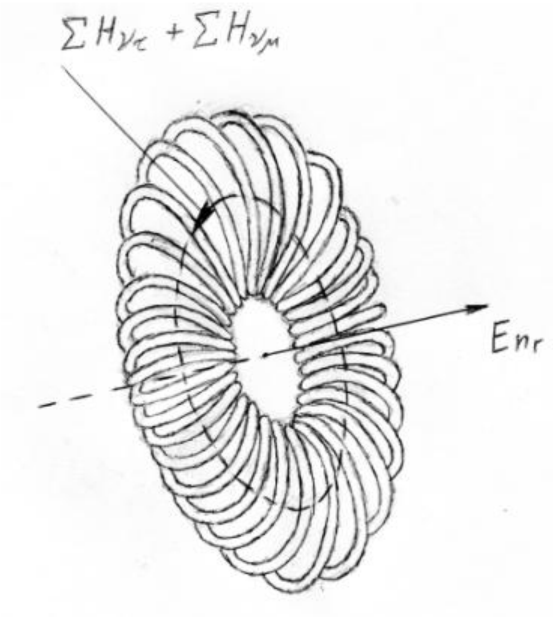


Fig. 2_14. The dipole moment of the relic neutron

The newly formed electric vortex does not by itself change the magnitude of the total electric charge of the relic neutron, but at the points of the "inflow" of the electric vortex into the relic neutron bagel and "outflow" from the bagel , electric poles are formed that give an additional dipole electric charge (dipole moment) to the relic neutron .

It should be noted that the dipole moment of the relic neutron is preserved when it is converted into "simple" neutrons and protons in the process of nr_nucleosynthesis.

The dipole moment creates a certain asymmetry in the relic neutron and nucleons. In other words, they have a "left" side that coincides with the direction of the dipole moment, and the opposite "right" side. Because all the magnetic and electric vortices in the relic neutron and nucleons are related (coherent), then it is not difficult to see that the direction of the dipole moment of coincides with the direction of the magnetic moments of slit magnets of the quarks d and is opposite to the direction of the magnetic moments of slit magnets of the quarks u.

It must also be noted that the force that arises from the interaction of the dipole moments of nucleons with one another is much less than the force that occurs when slit magnets interact. But the "range of action" of the dipole moments is much larger, because they interact by means of flagellums from virtual photons.

The dipole moments of relic neutrons and nucleons play a very important role in the process of nr_nucleosynthesis of the isotope spectrum, mutually orienting the incoming relic neutrons and isotope nuclei in one direction of the dipole moments, but more about this later.

On the ninth question (where are the quarks?):

According to the SM, the reference neutron, with a mass of 939.5653782 MeV, consists of three quarks: two quarks d, a mass of 4.79 MeV, one quark u, a mass of 2.01 MeV, and some quantity of massless gluons g.

A total of three quarks contains a mass = 2 * 4.79 - 2.01 = 11.59 MeV (1)

It turns out that the gluons in the reference neutron account for a mass of =

939.5653782 - 11.59 = 927.9753782 MeV (2)

Now consider the S_model of the neutron structure from the deuterium atom n (60-60-4-4):

As we determined when analyzing the previous question, the reference neutron of deuterium includes 60 pieces. tau neutrinos of total mass = 60 * 15.46625630 = 927.97553782 MeV (3)

Then the mass of the "hoop of quarks" with the 60 mu-neutrinos strung on it will be equal to = 939.5653782 - 927.97553782 = 11.59 MeV (4)

Let's check this, i.e. we calculate the mass of the set of simples (60 * 2Sμ + (2 * 2Sd- + 4Su +)) = 60 * 2 * 0,092914675 + (2 * 2 * 0,072133125 + 4 * 0.037926625) = 11.59 MeV (5)

The mass coincidence data in SM and in ST (1) = (5), and (2) = (3) are certainly not random, it is the "result" of our calculations, with which we will get acquainted after analyzing S_models of the base particles of matter (someone to smile and say "fit"). Let, for now, there will be a "fit", but one way or another, we can fix that in the S-model of the neutron a "hoop of quarks" with 60 pieces strung on it. mu-neutrinos by mass (and charge) is equivalent to the triad of reference quarks of neutron in the SM.

Let's continue the calculation - divide 60 pieces mu-neutrinos into three groups of 25, 10, and 25 pcs. and conditionally refer them to the three fragments of the "hoop of quarks" 2Sd-, 4Su + and 2Sd-.

Now we calculate the mass of these groups of simples:

the mass of the group of simples (10 * 2Sμ + 4Su +) = 10 * 2 * 0.092914675 + 4 * 0.037926625 = 2.01 MeV

the mass of the group of simples (25 * 2Sμ + 2Sd-) = 25 * 2 * 0.092914675 + 2 * 0.072133125 = 4.79 MeV

We have obtained that the indicated groups of simples by mass (and charge) correspond to u_quark and d_quark in the Standard Model.

For us, of course, this is not surprising, because, as Valery Rubakov said, "The new physics should fully explain everything that the Standard Model explains, plus something new."

Of course, we could not do without the known values of the quark masses in our calculations and in the constructions of S_models of elementary particles, so they "float" in certain combinations of simples in S_theory.

However, the given groups of simples are not quarks at all! Such isolated groups of simples simply can not exist.

Attentive reader could already notice that 25 pcs. mu-neutrino, i.e. 50 pcs. Sμ will make up a package of simples 50 (d) thick, and such a package of simples simply will not fit on the fragment of the "quark hoop" of two simples Sd - the total length of which is slightly more than 42 (d).

Therefore, the reduced groups of simples (10 * 2Sμ + 4Su +) and (25 * 2Sμ + 2Sd-) are, as it were, virtual quarks, u and d, but in fact there are no such groups in the form of autonomous separately allocated groups of simples.

This dilemma of the existence of real or virtual quarks has its permission in S_theory, but we'll talk about this in Chapter 3 of our work "Calculations of Simples Parameters."

Now we will determine the cause of the decay of the relic neutrons and S_models of proton and electron , after which we proceed to calculate the parameters of the simples.

S-models proton, electron, antineutrino

As is known, the ß-decay of a neutron passes through the formula: n → p + e- + ve

This formula is valid for all neutrons, incl. and relict neutrons, the differences for different neutrons will be the number of mu-neutrinos entering into one or the other neutron and proton.

The S-model of the relic neutron (the left-hand side of the formula) is known to us, we will deal with the S-models of the terms on the right-hand side of the formula, starting with the proton.

The proton's S-model differs from the S-model of the neutron by two elements:

1) in the "quark hoop", one block of 2Sd- was replaced by a 4Su + block (confinement),

2) the number of mu-neutrinos decreased from 61 pcs. up to 53 pcs. on 8 pcs.

But, before we start to describe the process and the result of the decay of the relic neutron, we would like to understand the cause of the neutron decay (?).

The cause of the decay of neutrons (stage 1 of decay of the relic neutron):

What was the trigger of the decay of the relic neutron? And why does not a free proton decay? To answer these questions, let's look at the S_structures of a neutron and a proton "under a microscope."

In these S_structures there is one "thin place" (or rather, not one but three). These are the areas of joining the 2Sd- and 4Su + fragments in the "quark hoop". In these places, the 2Sd- and 4Su + blocks do not reach each other, forming gaps (!)

On the one hand, these gaps play a positive role in the construction of nucleons. They do not allow the occurrence of short-circuited azimuthal electric vortices of the 2Sd- and 4Su + blocks (which we already mentioned). In addition, these gaps are free elements that ensure a constant tension of the "hoop of quarks" and that squeezed the inner part of the torus of nucleons into a "strong keg". Let's compare - and what is the magnitude of these gaps in the neutron and in the proton?

Earlier, when analyzing the S-model of the neutron, we already calculated that the gaps in its "quark hoop" of neutron are equal:

(132.566 - 129.566) / 3 = 1 (d), where

132.566 (d) - length of the midline of the "hoop of quarks" in the neutron;

129.566 (d) - the total length of the three fragments of the "hoop of quarks" in the neutron;

3 - the number of gaps between the fragments of the "hoop of quarks" in the neutron.

We shall carry out a similar calculation of the gaps for the "hoop of quarks" in the proton:

(132.566 - 131.754) / 3 = 0.27 (d), where

The total length of the three fragments of the "hoop of quarks" in the proton is equal to:

4 * 11,162 + 2 * 21,229 + 4 * 11,162 = 131,754 (d)

As we can see, the gap in the "hoop of quarks" for a neutron is much larger than for a proton.

In the free state of the nucleons, all their simples are "playing" under the influence of external and internal impacts.

External impacts can be collisions with other particles. And internal impacts are permanent electromagnetic "jerking" of each other's simples.

As a result, in the neutron, two fragments of the "hoop of quarks" consisting of 2Sd- due to the interaction forces of the electric charges additionally slightly repel each other and are attracted to the 4Su + fragment. If this additional offset is 0.5 (d) for each 2Sd- fragment, then the gaps between the 2Sd- and 4Su + fragments become 0.5 (d) and the gap between the two fragments 2Sd- becomes 2 (d). And in such a gap, the nearest mu-neutrino may fail. The mu-neutrino simple-bagels are burnt by the powerful internal magnetic vortex of the "hoop of quarks" and the mu-neutrino bursted.

This event has a destructive effect on neighboring mu-neutrinos, which also bursted (8 mu-neutrinos are bursted), and bursted 2 fragments of 2Sd-, into the gap between which the mu-neutrino failed. They, too, are destroyed, happening, as it were, a local microexplosion, leading to the breaking of the 16 Sμ and the disintegration of two blocks with four Sd.

In protons, the gap in the "hoop of quarks" is much smaller and can not reach a critical value of 2d for a mu-neutrino to fall into it, this protects protons from such a fate.

Note (repetition of "Safety Techniques"): The above described fall through of simples in the gap (a powerful magnetic vortex) between the ends of other simples-spirales is the second type of violation of "Safety Techniques" when constructing objects from simples.

The first type of violation of the "Security Techniques" in the construction of objects from simples is the docking of the ends of the simples-spirales with opposite charges (multidirectional azimuthal electric vortices) without a gap.

Inadmissibility of violation of these ST requirements should be borne in mind when constructing objects from simples.

The consequences of a local microexplosion (the second stage of the decay of a relic neutron):

In the process of microexplosion were burst 8 pcs. mu-neutrinos and two fragments of the "quark hoop" 2Sd- . , which broke up into simples. As a result, formed free ones: 8 pcs. * Sμ-, 8 pcs. * Sμ + and 2 blocks of 2 pcs. * Sd-. The symbol * means that all the simples data is slightly "burned" and slightly shorter than the original simples.

In addition, it should be noted that the "scorched" sym- bols * Sμ- and * Sμ + can no longer curl up into bagels (not enough length) and they begin to shorten.

The "blast wave" from the microexplosion tries to throw out the entire set of simples-spirales from the neutron through the gaps between the tau-neutrinos in the outer part of the neutron torus.

But, inside the neutron appeared the unbalanced force of a powerful magnetic field (vortex) of the fragment of the "quark hoop" 4Su + that remained in solitude. He urgently needs two more fragments in order to close the "hoop of quarks" again. It draws to itself, the newly freed simples-spirales, and two new fragments of 2Sd- and 4Su + (**confinement**) are formed from 2 * Sμ- and 4-x * Sμ +. The "quark hoop" closes again, collecting a necklace from the remaining 53 pcs. mu-neutrinos.

On this the formation of the proton is over.

We draw your attention to the fact that with microexplosion inside nucleons that lead to the destruction of two fragments of the "quark hoop" (two quarks), the same fragments of the "quark hoop" always burst, and the opposite fragments of the "quark hoop" are formed. If one fragment of the "hoop of quarks" (one quark) bursts, then a quark of the opposite kind is formed in its place (confinement, nothing can be done!). As a result, the nucleon changes its a type to the opposite (the neutron becomes a proton, and the proton becomes a neutron).

This assertion can be regarded as **postulate No. 7** of the S-theory. The reason for this very replacement of quarks (the "mechanics" of confinement) will be discussed later, when we become acquainted with a large number of variants of the S _ formulas of nuclear reactions.

"Destiny" of the remaining 6 pcs. * Sμ-, 4 pcs. * Sμ + and 2 blocks of 2 pcs. * Sd- we consider below.

Formation and S_model of the electron (3rd stage of the decay of the relict neutron):

After the transformation of the relic neutron into a proton, left out of work, "burnt" simples-spirales: 6 pcs. * Sμ-, 4 pcs. * Sμ + and 2 blocks of 2 pcs. * Sd- can not fold into bagels (not enough length). By analogy with the stage of quantization of lengths of simples, the process of their shortening (dropping the turns of the TEV) should begin.

But, unlike the stage of quantization of the lengths of simples, when space was not transparent for electromagnetic interaction (virtual photons were absent), at this stage the electromagnetic forces outstrip the shortening process, attract the ends (magnetic poles) of the simples-spirales to each other, and if they turned out to be multi-polar a new process begins-the process of annihilation.

The simples-spirales * Sμ + (4 pcs.) And two blocks of 2 * Sd- (4 in total * Sd-) are burned first in the "furnace" of annihilation. More details about the process of annihilation of simple and the result it , we will discuss below.

The remaining * Sμ- (6 pcs.) "survive", there is no one else to annihilate with them. They are "quickly" shortened to the resonance length L (Se-) and under the action of magnetic forces are combined into a single block of 6 simples-spirales, which twisted into the bagel of an electron (Fig. 2_15).

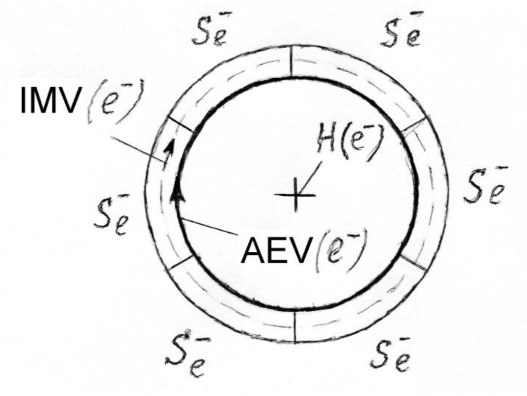


Fig. 2_15. S_model of electron

When considering the S-model of a neutron, we already noted that the magnitude of the symbol charge equal to (+/-) 1/6 of the electron charge was chosen not accidentally, but based on the fact that the electron should consist of 6 pcs. simples. And our result is exactly six simples (!).

Let's check the mass of the formed electron

mass e- = mass Se- * 6 = 0.085166485 * 6 = 0.51099891 MeV,

which corresponds to the mass of the reference electron.

Remembering the correlation of masses and lengths of simples, we calculate how shortened Sμ- turned into Se-

(length Sμ - length Se-) / length Sμ = (27,346 - 25,065) / 27,346 = 2,281 / 27,346 = 8,3%

It turns out that Se- is "burned" and shortened by about 2d or 8% Sμ-.

Recall that this resonant length (Se-) existed earlier in the synthesis of simples, but only the Se- and Se+ simple did not have the length and flexibility to curl up in a bagel. As a result, they remained simples-spirales and got into the "roulette" forming blocks of simples-spirales. Here, too, they were "unlucky", they could not gather in blocks even for 2 pcs. because of too long length and strong "Brownian" movement at high temperature at this stage. This means that electrons (and positrons) could not form in the stage of grouping of the simples-spirales into blocks (!).

True, other blocks with the participation of Se- simples could be formed, but they too could not participate in the formation of a relic neutron or other similar nucleon with zero charge (see the analysis of the second question).

Left unused at the stage of synthesis of relic neutrons, the simples-spirales Se- and Se+ ara annihilated with each other or with other short, simples-spirales.

At the stage of decay of relic neutrons, at the fallen temperature of the "environment", from the "scorched" simples-spirales Sμ- , Se- are formed, which are assembled into blocks of 6 pieces each. and these blocks are twisted into an electron bagel.

Notes:

1) One proton and one electron were formed from one decaying relic neutron, which combine into an electro neutral hydrogen atom.

2) As shown, the calculation of the balance of simples just performed by us in the decay of a relic neutron, the remaining simples suffices only for the formation of electrons. There are no free positive simples at all, this explains the complete absence of positron formation at this stage.

Antineutrinos

In the description of the process of decay of the relic neutron, we do not yet have (not formed) electron-antineutrinos.

S_ the decay formula of the relic neutron at the moment can be written as follows:

2Sd- + 2Sd- + 8Sμ- + 8Sμ+ → 4Su+ + 2Sd- + 6Se- + annihilation [4Sμ+ + 2 * 2Sd-] + gluons

From this equation it follows that antineutrinos could only be formed as a result of annihilation of 4 positive and 4 negative simples (two bursted quarks d by two simples-spirales Sd-), there is simply no other material for their formation.

The birth of antineutrinos is the result of simples annihilation

In the Standard Model, annihilating particles are points with opposite charges. In the process of annihilation, the charges are mutually neutralized, and the entire mass of the particle-points passes into energy according to the well-known formula E = m * c2. True, energy in the "bare" form, outside the particles, can not exist. In SM, the most sterile energy carriers are photons (there is no mass, and the energy E = h * ν is). Therefore, the result of annihilation in SM are always photons.

In S_theory, simples-spirales are annihilated, but not particles . Even if we know that particles are burned in some reactions in the annihilation furnace, it means that the "Safety precautions" have been violated. As a result, the simple-bagels unfold into simples-spirales and there are prerequisites for the annihilation of the multi-polar simples-spirales.

A necessary condition for the annihilation of simples-spirales is the presence in the surrounding space of virtual photons or gluons, through which the forces of electromagnetic interaction between the magnetic vortices of the simples-spirales are transmitted, and the forces of their attraction arise.

The lack of a sufficient number of virtual photons and gluons at the initial stage of the formation of simples prevented the annihilation of the simples-spirales and allowed them to convolve into bagels and form blocks of simples-spirales and eventually form composite aggregates in the form of relict neutrons.

At the stage of decay of relic neutrons, there are already enough free gluons, educated in the surrounding space formed during the shortening of the simples-spirales to the resonance lengths. Therefore, free simples-spirales first of all through the chain of gluons are attracted to each other by their magnetic poles (ends of the simples-spirales), forming an arc-like doublet of simples. If there is a pair of multipolar simples in the doublet, then when they come into contact with their ends, a short-circuit of counter azimuthal electric vortices is formed (see Fig. 2_4).

A local microexplosion takes place, which releases the envelopes of toroidal electric vortices from the curved doublet in one direction, and the merged internal magnetic vortices of the simples receive a recoil momentum in the other direction and then collapse into an elliptical closed magnetic vortex that generates an elliptical closed electric vortex, etc. . (a real photon was formed, the length of which is equal to twice the distance between the foci of vortex ellipses).

The ejected shells of toroidal electric vortices according to the scheme before described by us are transformed into two opposite polar simples Sev- and Sev +, from which the electron-antineutrino ve is formed.

This completes the decay of the relic neutron.

Taking into account that from each pair of annihilating simples-spirales (blocks of simples) one electron-antineutrino and one real photon are formed, the total S_formula for the decay of the relic neutron can be written as follows:

8νμ + 2d → 8Sμ- + 8Sμ+ + 2Sd- + 2Sd- → 4Su+ + 2Sd- + 6Se- + 2 (ve + γ) + Mg, or

nr → p + e- + 2 (ve + γ) + Mg, where

Mg is some "heap" (M) of gluons (g) formed when all the bursted simples are shortened.

The resulting formula for the decay of the relic neutron differs from the classical formula in the Standard Model by two elements:

1) as a result of the decay of the relic neutron, two real photons (γ) were additionally formed, which in the classical formula (n → p + e- + ve) are absent;

2) as a result of the decay of the relic neutron, not one but two electron-antineutrinos were formed.

By the first difference, it can be noted that there are many nuclear power sources built on the ß-decay of radioactive isotopes and the conversion of the heat into the electric energy. The energy sources of the braking particles are considered sources of heat. But, the proton remains practically in place of neutron and its kinetic energy practically does not change. The resulting electron is captured by the electrostatic force of attraction of the proton formed and takes its place in the electron shell of the isotope and all its kinetic energy remains in place. To slow down neutrinos and get energy from them is still a difficult task to solve.

When calculation the energy balance of the ß-decay of a neutron, for some reason, the option is ignored that the best sources of heat in a given reaction can be photons.

It should be noted that according to the calculation (which we will present later) the resulting photons in terms of energy level are related to the range of gamma quanta. Their transformation into thermal photons occurs through their capture by electrons and secondary radiation with reduced energy, while the electron is excited and passes to a higher orbital.

S_theory predicts the presence of such photons in practically all nuclear reactions, it is up to the experiments to confirm or disprove this conclusion.

By the second difference, it should be noted that some theorists already question the law of conservation of the lepton charge in nuclear reactions [5]. S_theory only confirms this assumption, moreover, as will be shown in Chapter of the analysis of the reactions of nr_nucleosynthesis of the spectrum of the nucleus of isotopes, up to 112 mu-neutrinos can burst in these reactions (for 4He), and even more (126 pcs of mu-neutrinos in 14O) with the allocation of a corresponding amount of electron-antineutrinos and real photons.

This conclusion of S_theory is at odds with traditional theoretical concepts and available experimental data on registration, for example, solar electron-antineutrinos. The measurements show a shortage of two to three times the number of mu-neutrinos and number corresponding nuclear reactions to the Sun. In accordance with the conclusions of S_theory, this deficit increases, approximately, by an order of magnitude.

Moreover, according to SM, electron-neutrino and -antineutrinos are formed only in nuclear reactions that lead to a change in the ordinal number of the element in the periodic table. According to the described mechanism for the formation of electron-antineutrinos in S_theory, they must be formed in all nuclear reactions in which a mu-neutrino bursts (a mass defect occurs), for example, when a neutron merges with a proton and deuteron is formed (the ordinal number of hydrogen and deuterium in the periodic table is one and the same).

It is possible suggested by us a mechanism of "recycling" of simples from bursting mu-neutrinos and fragments of the "hoop of quarks" is not true. It is possible that after the restoration of the missing fragments of the "quark hoop" and the formation of the electron, all the remaining "splinters" of the bursting simples gather into a single block and arrange "collective self-immolation" in a single annihilation reaction, with the formation of a single electronic-antineutrino. It is possible, although it is unlikely.

And another option is possible, that we simply do not know enough how to capture and register all electronic-neutrinos and antineutrinos and they fly past our detectors by unregistered migrants. In this case, a chance exists for the formation of electronic-antineutrinos in the quantity described by us, proportional to the number of bursted mu-neutrinos.

Time and additional experiments will show where the truth is.

S_model of neutrino oscillations

The above mentioned deficit of solar neutrinos (antineutrinos) of physics is explained by oscillations (mutual transformation) of different types of neutrinos into each other.

From the point of view of S_theory, the mechanism by the neutrino oscillations is not obvious, although it is possible. He can look like this.

Under the influence of their magnetic moments, the electron-neutrino (or antineutrino) can be assembled and aligned into single long blocks, which can reach the length of the mu-simples, and twisted into bagels (Sμ).

In this case, however, a "problem" arises - the data of the mu-simple-bagels will not have an electric charge, because all the combined the electron-neutrino (antineutrinos) do not have an electric charge. So, two such bagels will not be able to form a mu-neutrino.

This "problem" is solved by "fluctuation". If one reverse simplex ("half") of the electron neutrino (antineutrino) "slips" into the forming block of electronic-neutrino (antineutrino) , the block will receive a no compensated electric charge that will be transmitted to the mu-simples-bagel. Two such mu-simple-bagels with opposite charges joining together form a high-grade mu-neutrino (see Fig. 2_16).

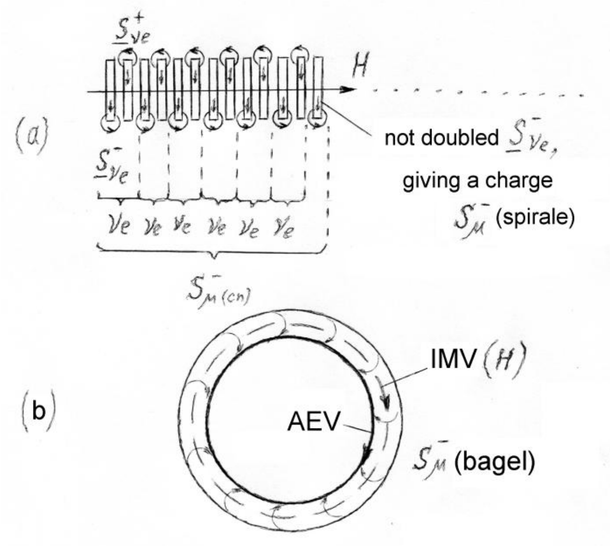


Fig. 2_16. S_model of oscillations of electronic neutrinos in mu-neutrinos

True, this scheme does not imply the growth of a block of electronic-neutrinos (antineutrinos) to the length of tau-simples. At the boundary of the length of mu-simples, they must necessarily curl up into mu-bagels.

In general, the ratio of S_theory to the idea of neutrino oscillations is twofold: on the one hand, S_theory does not deny the possibility, but rather suggests the possibility of "sticking together" electronic-neutrinos and antineutrinos under the influence of their magnetic moments in "long" block with subsequent twisted into bagel. On the other hand, S_theory "limits" this process to the formation of only a mu-neutrino.

On the whole, the idea of oscillating toroidal particles under the influence of their magnetic or dipole moments in "long" blocks with their subsequent convolution into bagels is very fruitful and is widely used in S_theory when constructing designs of various particles and aggregates from simples. We will return to it in the last chapter (Fourth Physics), in which we will simulate the process of formation of virtual photons and first simples.

Notes on the problem of solar neutrino oscillations (insert as of 10.16.2017)

1. Let us compare the S-model of the oscillations of the electron-neutrino (antineutrinos) in a mu-neutrino, with the graph of the coefficient of flexibility (the minimum critical length of the simples-spirales (Lmin) which can be twisted into simple-bagels).

From the graph it follows that the length of the mu-neutrino is ~ 27d and corresponds to the coefficient of flexibility and temperature of the Universe in the Cosmological epoch of neutrino formation from the Simpl-gluon plasma (right after the Big Bang). In our Cosmological epoch, the value of the coefficient of flexibility of simples is ~ 150 (the of the block of simples forming an electron). It is obvious that the temperature of the solar wind is much lower than the temperature of the Universe in the Cosmological epoch of Simpl-gluon plasma, at which the flexibility coefficient is 27 units. And this means that along the way from the Sun to the Earth, electronic-neutrino blocks with length 27d could not twisted into bagels and form mu-simples (with subsequent merging them into mu-neutrinos).

We conclude that the electronic neutrinos formed in the process of thermonuclear reactions on the Sun oscillate in the mu-neutrino even when they move inside the Sun at a significantly higher temperature and under the influence of a strong magnetic field of the Sun. And a set of electronic- and mu-neutrinos is already flying out of the Sun in a specific ratio, in this ratio they reach the Earth. This corollary of the S_theory could be verified by measuring the neutrino ratio of various types in the Solar Wind in other orbits between the Sun and Earth or beyond the Earth's orbit. Only neutrino detectors are too large to be placed their on space vehicles or are collected on Mars or Venus.

2. The readers probably paid attention to the asymmetry of processes of the shortening of the simples and the oscillations (growth) of the mu-neutrino from electronic-neutrinos. Why can both processes take place in nature, although at first glance they are opposite to each other? The difference between these processes is as follows:

The shortening is processes of decay of the unstable simples, and the shortening process continues until a certain resonance length (Lres) is reached, at which the simple-spirale twisted into a bagel.

Oscillations are subject to stable toroidal aggregates that have magnetic moments, for example, electronic-neutrinos. The process of oscillating toroidal aggregates into long "tubular" aggregates under the action of their internal magnetic moments when reaching a certain critical length (Lcr) can lead to their twisting into a bagel. The example of oscillation is the formation of tau-neutrino and mu-neutrino blocks, which are later used as "building blocks" in the formation of a relic neutron. In the future, we will encounter some more examples of oscillations of larger torus-shaped objects.

The energy result of the reaction of the decay of the relic neutron

The energy result of the decay of the relic neutron is approximately equal to:

E ~ nr - p - e- 2ve = 1.34 MeV

It is distributed, basically, between the kinetic energy of two electron-antineutrinos and the energy of two photons (gamma quanta).

The term "approximately" is used by us for the reason that the mass (energy) of the formed gluons is not taken into account in the above formula, we will calculate their estimate in the fourth chapter.

Density of Simples and Nucleons by S_theory

All simples have the same diameter of the "body" of the simples (d), inherited from the virtual photons. This means the equality of the "density" of their toroidal electric vortices and internal magnetic vortices, and hence the equality of the mass density per unit length of the simples, and hence the equality of the mass density per unit volume of simples. We will calculate the density of simples on the basis of parameters of tau-simples. We give the values of the parameters of tau-symbols and perform the calculation:

Form: a torus (bagel)

Mass: m = 7.733128152 (MeV) = 1.3785546 * 10^{-26} (g)

Outer diameter: D = 0.427435833 (fm) = 4.27435833 * 10^{-14} (cm)

The diameter of the "body" of the torus: d = 0.0005892 (fm) = 5.892 * 10^{-17} (cm)

The volume of the "body" of the simple: V = (π2 * (D-d) * d2) / 4 = 3,65626 * 10^{-46} (cm^3)

The density of the simple: ρS = m / V = 3.77 * 10^{19} (g / cm^3)

Nucleon density

In classical nuclear physics, the density of nucleons is estimated as 10^{15} g / cm^3. It is assumed that they have a shape in the form of a sphere (balls).

In S_theory, as we disassembled, the nucleons (neutrons and protons) are the same toroidal aggregates, formed from simples, in shape and size, their S models are very similar and differ only in the number of mu-neutrinos and in the composition of the quark. The variable composition of the mu-neutrinos and quarks means that the density of nucleons, as a ratio of their mass to the volume of the toroidal aggregate, is insignificantly different from each other. But for us now only the order of density is important, so we will calculate the density of nucleons using the reference proton as an example. Below are the values of its parameters and the calculation itself:

Form: toroidal aggregate (bagel)

Mass: m = 936.7853782 (MeV) = 1.66997 * 10^{-24} (d)

Outer Diameter: D = 0.8768 (fm) = 8.768 * 10^{-14} (cm)

The diameter of the "body" of the torus: d = 0.427435833 (fm) = 4.2744 * 10^{-14} (cm)

The volume of the "body": V = (π2 * (D-d) * d2) / 4 = 2,025 * 10^{-40} (cm^3)

The density: ρS = m / V = 8,244 * 10^{15} (g / cm^3)

Conclusions:

1. As we see, the density of nucleons in S_theory is of the same order as in classical nuclear physics, but approximately twice as large. This is explained by the fact that the volume of a nucleon in the form of a torus is approximately half the volume of a nucleon in the form of a sphere with the same diameter.

2. The density of the simples is higher than the density of nucleons by about four orders of magnitude, this indicates that only 1/10000 part of the volume of nucleons is filled with simples, i.e. 99.99% of the volume of nucleons is "empty". We will return in our work to the analysis of the density of subnuclear, nuclear and mega objects, and now we are completing the second chapter and proceed to the calculation of the parameters of the simples on the basis of which the S_models of base particles were developed in this chapter.

Conclusion of the 2nd chapter

The second chapter presents the Cosmological concept of formation of the main basic particle - the relic neutron, its further decay into a proton and an electron, followed by the stage of nr_nucleosynthesis of the entire spectrum of atoms (isotopes). The proposed Cosmological Concept excludes the stage of mass annihilation of particles and antiparticles, with the formation of matter from a small predominant number of particles over antiparticles.

S-models of relic neutron, reference proton, reference neutron, electron are proposed. The proposed S-models agree with the reference values of the masses of the data of basic particles and realize the idea of the presence in the nucleons of an expenditure material (mu-neutrino) responsible for the formation of a mass defect in all nuclear reactions.

The second key element of the proposed S_models of nucleons is the formation of slit magnets in them, responsible for the strong interaction of nucleons with each other. A detailed discussion of the process of nr_nucleosynthesis of the isotope spectrum, the action of strong interaction forces and their correlation with the elements of S_models of nucleons will be considered in a separate chapter.

The process of formation of the electron-antineutrino is considered separately and its S_model is proposed. The proposed variant assumes the formation of electronic-antineutrinos in much larger quantities, which is at variance with traditional theoretical developments and experimental data. This question requires additional study.

In conclusion, a comparative calculation of the density of simples and nucleons in S_theory is given.

Chapter 3. Calculation of the parameters of simples and their number in S_models of base particles

Calculation of basic parameters of basic symbols

Introduction

In the second chapter we presented a physical model for the formation of basic particles of matter from simples. As a result, we proposed S_models of the relic neutron, a standard proton, a standard neutron and an electron, as well as S_models of the processes of their formation. In the third chapter, based on these S_models and reference parameters of the data of the base particles, we will calculate the parameters of the simples.

An additional complication of this problem was that all nuclear and subnuclear processes, according to experimental data, have the so-called. mass defect. For him explanation in the SM and in related theories of the micro world, a mechanism for the transition of mass to energy and back has been developed and adopted. Accordingly, the individual laws of conservation of mass and conservation of energy have become a single law of conservation of mass and energy.

Individual physicists begin to doubt, and in a single law of conservation of mass and energy, and they are ready to give up on him. This approach is very similar to the known epicycles of Ptolemy.

In order to break away from this, in our opinion, a vicious circle, it is necessary to introduce physical models of the processes and objects under consideration into physical theories and return to separate laws of conservation of mass and energy (taking into account their interrelationship).

The S-models of particles and the S-models of the processes of their formation and transformation offered by us explain the phenomenon of mass defect purely within the framework of the law of conservation of mass with a partial mass transfer (mass defect) to energy, carried away by real photons, electron-antineutrinos, unbound gluons, and changes in the kinetic energy of the particles.

In accordance with this approach, it becomes possible, knowing the masses and the S_models of base particles, to calculate the masses of their constituent simples.

We must say that this calculation was not given to us immediately. In the process of calculating the parameters of simples, we many times went into the "dead end". First at the stage of determining the quantitative composition of the simples in the S_models of the basic particles. Then at the stage of calculating and "linking" the masses of the basic symbols and reference masses of the basic particles. Then at the stage of calculating the masses of the isotope spectrum in the process of nr_nucleosynthesis. And the most recent "inconsistencies" "got out" at the stage of construction and calculation of S_models of modern nuclear reactions. And each time we had to return to the very beginning, again and again to check our basic S-models and refine the calculation of the parameters of the simples.

In the proposed calculation, we tried to keep the real sequence of steps (iterations), by which we went to the final result. However, in this case, we will have to repeat some calculation steps several times (making iterative iterations). But as a result, it allows us to better understand the logic of our calculation and the adoption of certain "revolutionary" solutions.

Honestly, the final version presented to you for consideration "surprised" us. Initially, we planned to build S_models of elementary particles, nuclear and subnuclear processes on the basis of simples, corresponding to the reference and experimental data at a new "qualitative" level, which confirms the fundamental possibility of the formation of elementary particles and atoms from simples. The received result has surpassed our expectations. The proposed S-models and simulated parameters of simples make it possible to carry out a quantitative calculation of all the main nuclear reactions, additionally reflecting some of their previously unknown sides (see Chapters 4 - 9).

Step 1 - determine how many large weights (tau neutrinos) enter neutrons and protons, calculate the masses of tau-neutrinos and tau-simple

neutron mass (reference) n(ref) = 939.5653782 MeV

mass of tau-neutrinos (reference) $v\tau$(ref) = no more than 15.5 MeV

the quantity of tau-neutrinos in a neutron (ref) = INTEGER (939,5653782 / 15,5) = 60 pieces

proton mass (reference) p(ref) = 938.272013 MeV

the quantity of tau-neutrinos in the proton (ref) = INTEGER (938,272013 / 15,5) = 60 pieces

we assume that according to S_theory the mass of mu-neutrinos and the "quark hoop" of nucleons in are equivalent to triads of quarks - (2 * u + d) in the proton and (u + 2 * d) in the neutron. Then the formula of mass of neutron (reference) can be written as :

n(ref) = 60 * $v\tau$ + (u + 2 * d)

according to the SM

u-quark mass reference u = 2.01 MeV

d-quark mass reference d = 4.79 MeV

then we can determine the calculated mass of the tau-neutrino

$v\tau$(calc) = (939.5653782 - 2.01 - 2 * 4.79) / 60 = 15.4662563 MeV

the resulting calculated mass of tau-neutrinos agrees well with its reference mass of the tau-neutrino (not more than 15.5 MeV)

respectively, the mass of the tau-simples = 15.4662563 / 2 = 7.733128152 MeV

Determined the amount of tau-neutrinos, we can calculate the internal diameters of the S_models of a neutron and a proton:

a) the length of the center line (circle) of the chain of beads from 120 Sτ = 120 (d)

b) diameter of the center line (circle) of the chain of beads from 120 Sτ = 120 / π = 38.197 (d)

c) the diameter of the lumen in the torus (circle) of the chain of beads from Sτ = 38,197-1d = 37,197 (d)

d) diameter of the center line (circle) of the chain of beads from Sμ = 38.197 + 2d = 40.197 (d)

e) the length of the midline (circle) of the chain of beads from Sμ = 40,197 * π = 126,283 (d)

e) diameter of the center line (circle) of the "hoop of quarks" = 40.197 + 2d = 42.197 (d)

g) length of the center line (circle) of the "hoop of quarks" = 42.197 * π = 132.566 (d)

We will need these values in further calculations.

Step 2 - we compose the S-model of the quarks u and d, select the reference mass of the mu-neutrino, calculate the masses of the simples Su+ and Sd- (the first iteration), check the calculated masses of the reference neutron and the reference proton

Above we have already suggested that in u_quarks there are 4 simples of Su+ and some amount of mu-neutrinos, and in d_quarks there are 2 Sd- simples and some amount of mu-neutrinos. We denote by X the number of mu-neutrinos in u_quark, and Y is the number of mu-neutrinos in d_quarks. We obtain the equations S_models of the quark u and d:

u = X * $v\mu$ + 4 * Su+

d = Y * $v\mu$ + 2 * Sd-

for preliminary calculations we take the mass of the mu-neutrino (reference) $v\mu$(calc) = 0,18 MeV (mean value between 0,17 and 0,19 MeV, recommended in different sources)

we determine how many medium-sized weights (mu-neutrinos) enter into u_quark and d_quark:

X = INTEGER (2.01 / 0.18) = 11 (= const!)

Y = INTEGER (4.79 / 0.18) = 26 (= const!)

now we can calculate the masses of the simples of Su+ and Sd-

Su+ = (u - X * νμ) / 4 = (2.01 - 11 * 0.18) / 4 = 0.0075 MeV

Sd- = (d - Y * νμ) / 2 = (4.79 - 26 * 0.18) / 2 = 0.055 MeV

we check the calculated mass of the neutron from its S-model, we compare it with the reference mass of the neutron in the SM

n(calc) = 60 * ντ + (u + 2 * d) = 60 * ντ + (11 * νμ(calc) + 4 * Su +) + 2 * (26 * νμ(calc) + 2 * Sd-)

n(calc) = 60 * 15.4662563 + (11 * 0.18 + 4 * 0.0075) + 2 * (26 * 0.18 + 2 * 0.055) = 939.5653782 = n(rec) MeV (!)

we obtained the equality of the calculated neutron mass in ST and the reference mass of the neutron in the SM

Similarly, we check the calculated mass of the proton in ST and compare it with the reference mass of the proton in the SM

p(calc) = 60 * ντ + (2 * u + d) = 60 * ντ + 2 * (11 * νμ(calc) + 4 * Su +) + (26 * νμ(calc) + 2 * Sd-)

p(calc) = 60 * 15.4662563 + 2 * (11 * 0.18 + 4 * 0.0075) + (26 * 0.18 + 2 * 0.055) = 936.7853782 MeV (?)

but reference mass of the proton: p(rec) = 938.272013 MeV (!)

the defect of the reference mass of the proton in the SM and the calculated proton mass in the ST amounted to

Δp = p(rec) - p(calc) = 938,272013 - 936,7853782 = 1,4866348 MeV

Step 3 - analysis of the proton mass defect problem, change of the S_model of proton (introduction of the u*_quark), refinement of the calculated mu-neutrino mass (preparation of iteration 2)

We will not enumerate all our attempts to get rid of the defect in the mass of the proton. As a result, we realized that the problem of a defect in the mass of a proton is not unique, it is present literally in all nuclear reactions. It was at this moment that the idea arose that the proton is not a product of synthesis from simples (as a relic neutron), but that it is the product of a nuclear reaction of neutron decay, as a result of which the appearance of a mass defect is the inevitable given as for all nuclear reactions.

An analysis of the mass defects of various nuclear reactions has shown that their spectrum is very diverse, but it all they fits into the available resource of the stock of mu-neutrinos in the S-models of a neutron and a proton. In other words stock of mu-neutrinos can be throwing, as weights of medium size without violating the general S_design of nucleons.

From this we can conclude that the values of the masses u and d of quarks (or rather triad of quarks, which including mu-neutrino according to S_theory) are not constant. During the participation of nucleons in nuclear reactions, they constantly lose the mu-neutrino and become all is easier and easier.

This statement can be considered a complement or **other revision** of the previously fixed **6th postulate** of S_theory (ST).

But our reference proton (the nucleus of atomic of hydrogen) is real, why does the calculated proton ST not reach it by mass?

The answer is simple - in the S_formula of our calculated proton, compiled on the basis quarks of relic neutron (on based the idea of constant mass of quarks), there is a shortage of mu-neutrinos (!).

Our new idea of the inconstancy of the quark masses can be well illustrated by figures: in our calculated proton there is only 11 + 11 + 26 = 48 mu-neutrinos, while in our proposed S_model of proton (and neutron) along the corresponding circumference - the mu-neutrino seat length 126,283d, they can initially fit 61 pcs. mu-neutrino (see the analysis of the fifth question in the construction of the S-model of relic neutron). It turns out that in our S-model calculated proton there are in reserve 13 more free places for mu-neutrinos.

Let's calculate how much the mu-neutrino must be added in our proton formula, so that it turns into a reference proton.

The missing number of mu-neutrinos (K) in the proton equals:

K = Δp / ν_μ(calc) = INTEGER (1,4866348 / 0,18) = WHOLE (8,259) = 8 pcs.

We recall that the ß decay of a neutron passes through the formula: n → p + e- + ve

At the quarks level, it can be written as d → u + e- + ve

Obviously, 8 pcs. additional mu-neutrinos can be found only in u_quark formed from the d_quark. We denote this "nonstandard" u_quark by u* and write its formula as follows: u* = (X + 8) * ν_μ + 4 * Su+.

The new S_model of the calculated proton will then look like this

p(calc) = 60 * ν_τ + (u + u * + d)

The change in the number of mu-neutrinos in the S_model of the calculated proton must certainly affect the value of the mu-neutrino mass. Knowing the defect of the proton mass and the number of additional mu-neutrinos, it is possible to calculate not the alleged but the "true" (calculated) value of the mu-neutrino mass:

ν_μ(calc) = Δp / 8 = 1,4866348 / 8 = 0,18582935 MeV

the resulting calculated mass of the mu-neutrino agrees well with its reference mass mu-neutrino (from 0.17 to 0.19 MeV)

respectively, the mass of the Sμ_simple (calc) = ν_μ(calc) / 2 = 0,18582935 / 2 = 0,092914675 MeV

Step 4 (iteration 2) - for the new mass of the mu-neutrino we recalculate the coefficients X, Y, the masses Su+, Sd-, we check the calculated masses of the neutron and the proton

promptly repeat the calculation of the parameters X, Y, Su+, Sd- for the new value ν_μ(calc)

X = INTEGER (2,01 / 0,18582935) = 10

Y = WHOLE (4.79 / 0,18582935) = 25

Su+ = (2.01 - 10 * 0,18582935) / 4 = 0,037926625 MeV

Sd- = (4.79 - 25 * 0,18582935) / 2 = 0,072133125 MeV

Also, we will quickly check the calculated masses of the calculated neutron and the calculated proton:

n(calc) = 60 * ν_τ + (u + 2 * d) = 60 * ν_τ + (10 * ν_μ(calc) + 4 * Su+) + 2 * (25 * ν_μ(calc) + 2 * Sd-)

n(calc) = 60 * ν_τ + 60 * ν_μ(calc) + 4 * Su + + 4 * Sd-

n(calc) = 60 * 15.4662563 + 60 * 0.18582935 + 4 * 0.037926625 + 4 * 0.072133125 = 939.5653782 MeV (!)

p(calc)= 60*ν_τ + u + u* + d = 60*ν_τ+(10*ν_μ(calc)+ 4*Su+) + ((10+8)*ν_μ(calc)+ 4*Su+) + (25*ν_μ(calc)ч+ 2*Sd-) = 60*ν_τ + 53*ν_μ(calc)+ 8*Su+ + 2*Sd-

p(calc)c = 60 * 15.4662563 + 53 * 0.18582935 + 8 * 0.037926625 + 2 * 0.072133125 = 938.272013 MeV (!)

As we see this time, the calculated masses of the neutron and the proton in ST correspond to their reference masses in the SM.

Remark 1 - the readers may have been puzzled, as it was, calculated one of the foundational masses - the mass of the mu-neutrino from the "some" defect of the proton mass, applied this mass to the global recalculation of the S_models of the neutron and the proton, and almost all the others were exchanged parameters S_models (except for tau-neutrinos) and suddenly, the calculated masses of a neutron and a proton coincided with reference - this is mysticism some.

There is no "mysticism" here, let's try to derive the formula of the calculated mass of the mu-neutrino.

Let's compose the system of equations already known to us:

n(calc) = 60 * ν_τ + (u + 2 * d) = 60 * ν_τ + (X * ν_μ) + 4 * Su+) + 2 * (Y * ν_μ(calc) + 2 * Sd-)

p(calc)=60*ν_τ + u + u* + d= 60*ν_τ + (X*ν_μ(calc) + 4*Su+) + ((X+8)*ν_μ(calc) + 4*Su+) + (Y*ν_μ(calc) + 2*Sd-)

u = X * ν_μ(calc) + 4 * Su+

u * = (X + 8) * ν_μ(calc) + 4 * Su +

d = Y * ν_μ(calc) + 2 * Sd-u(rec) = 2.01 MeV

d(rec) = 4.79 MeV

n(calc) = n(rec) = 939.5653782 MeV

p(calc) = p(rec) = 938.272013 MeV

from the third and fifth equations we derive the formulas Su+ and Sd- (we already did this in step 2):

Su+ = (u - X * νμ(calc)) / 4

Sd- = (d - Y * νμ(calc)) / 2

now we substitute these formulas in the second equation:

p(calc) = 60*ντ + (X*νμ(calc) + 4*((u - X* νμ(calc)) / 4)) + ((X+8)*νμ(calc) + 4*((u - X* νμ(calc)) / 4)) + (Y*νμ(calc) + 2*((d - Y* νμ(calc)) / 2))

we will open brackets:

p(calc) = 60 * ντ + X * νμ(calc) + u - X * νμ(calc) + X * νμ(calc) + 8 * νμ(calc) + u - X * νμ(calc) + Y * νμ(calc) + d - Y * νμ(calc)

after reducing such terms, we obtain the equation:

p(calc) = 60*ντ + 2*u + d + 8*νμ(calc)

from this we find

νμ(calc) = (p(calc) - 60*ντ - 2*u - d) / 8 = (938,272013 - 60 * 15,4662563 - 2 * 2,01 - 4,79) / 8 = 0,18582935 MeV

We have obtained the same value of the mu-neutrino mass as in step-3, and surprisingly, according to the formula, it does not depend on other parameters of the S-models of the neutron and proton (with the exception of the mass of tau neutrinos). The values of u and d in this equation play the role of constants.

In principle, in our sequence for calculating the parameters of the basic simples and S_models of the neutron and thee proton, steps 2 and 3 could be skipped, but then we would have lost the "passage" about the defect of the proton mass, from which the global conclusion about the inconstancy of quark masses (triads quarks), and somehow it was necessary to calculate the addition of a mu-neutrino (8 pieces) to cover the defect of the e proton mass.

Having adopted the obtained values masses of the simples as a basis, let's calculate the length of the simples.

Recall that all simples have the same spiral diameter (d). Increasing the length of the simples increases their volume, filled with an internal magnetic vortex (stored energy), which, as we "agreed" earlier responsible for the mass of the simple (postulate No. 3). From this follows a direct proportion between the values of the masses and the length of the simples.

In order to calculate the lengths of the basic simples, we need to find some element S_model of the nuclon, consisting of simples, for which its mass and length is known.

And such an element we have is a "hoop of quarks" (for example, a neutron).

Earlier, we calculated the length of the "quark hoop" seat (with gaps between the fragments) = 132.566 (d).

We calculate the mass of the "quark hoop" for a neutron (without a mu-neutrino) = 4Su+ + 2Sd- + 2Sd- = 4 * 0.037926625 + 2 * 2 * 0.072133125 = 0.440239 MeV

To determine the density of simples, we need to know the size of the gaps between the fragments of the "hoop of quarks" of the neutron. In the second chapter, we have already "calculated" it, based on the declared "directive" values of the parameters of the simples. It's time to "confess" that the size of the gaps for neutrons, equal to 1d, is the "preset" value, starting from the analysis of the "mechanism" of the neutron decay described in Chapter 2. So we will not recount it.

Now we can determine the density of simples in MeV per 1d of the length of the simples = 0.440239 / (132.566 - 3) = 0.00339778755 MeV / d

We calculate the lengths of all the basic simples and blocks of simples that make up the fragments of the "quark hoop":

length of the simple Sτ = 7,733128152 / 0,00339778755 = 2275,930452 (d)

length of the simple Sμ = 0.092914675 / 0.00339778755 = 27.34563997 (d)

length of the simple Se- = 0.085166485 / 0.00339778755 = 25.0665276682 (d)

length of the simple Sd- = 0.072133125 / 0.00339778755 = 21.22943945 (d)

length of the simple Su+ = 0.037926625 / 0.00339778755 = 11.116215315 (d)

length of the fragment of simples 4Su+ = 4 * 11,16215315 = 44.6486126 (d)

length of the fragment of simples 2Sd- = 4 * 21.22943945 = 42.4588789 (d)

Step 5 - analysis of the results obtained (preparation of iteration 3)

Remark 2 - the same reader will say, I doubt - you say that the quark masses are not constant, but they use reference values of masses of the quarks in their calculations. We answer - the reference values of quark masses u and d were determined by the method of mathematical modeling [6]. "The quark masses were chosen so that the properties of the resulting hadrons corresponded to the experimental data." As reference to hadrons, reference neutrons and protons were, of course, used. In our calculations and S models, on the basis of which we carry out these calculations, we also operate with the reference masses of the neutron and proton (according to S_theory, the reference proton is the nucleus of atomic hydrogen, and the reference neutron is the neutron in the nucleus of the deuterium atom). So the objects and subjects of calculations converge, and there and so, to compose a balance of reference neutron and proton mass, we are entitled to use reference masses u and d quarks, considering that in these objects they are present in fact.

Remark 3 - the real composition of the u and d quarks from the mu-neutrino in that amount that we calculated does not correlate with the dimensions of the fragments of the "hoop of quarks". If the number of simples of Su+ and Sd- can be considered real, starting from the balance of electrical charges of simples and particles (requiring only their experimental confirmation), then the calculated quantities (X and Y) of the mu-neutrino in quarks u and d are virtual parameters that allow "to become attached" to reference masses of quarks. According to the S-models of a neutron and a proton, such a specific distribution (binding) of the mu-neutrino with blocs of the simples 4Su+ and 2Sd- forming the central strand of the triad of quarks does not correspond to their lengths (for the u quark, 10 pcs of mu-neutrinos are small for the length of the fragment equal to 44.6486126d, For the u * quark, 18 pcs of mu-neutrinos are also too small for the length of the fragment equal to 44.6486126d, and for the d_quark 25 pcs of mu-neutrinos is very much for the length of the fragment equal to 42,4588789d).

Remark 4 (the most important remark) - according to the concept of mass defect formation in S_theory - the number of mu-neutrinos in the composition of all nucleons should decrease as they participate in nuclear reactions, i.e. is a variable number. This means that the mass of quarks according to the "old" scheme containing the mu-neutrino can not be constant (!), This means that the "old" scheme is not true (!).

Conclusion:

So it turns out that Remarks 3 and 4 we do to ourselves (!)

If we rephrase them, then we can say that the S-models of quarks we obtained are virtual, and not real.

From this problem, there are two outputs, one virtual, the other "real".

Virtual Exit (from Remark 3)

To declare all the mu-neutrinos entering the nucleons as the "common property" of the triad of quarks and allow them, say, a uniform distribution over the "hoop of quarks". This option, by the way, is not bad "combined" with the principle of confinement of quarks (they say, do not try to separate us one by one).

The "real" way out (from Remarks 3 and 4)

To reach the "stable" S_model of real quarks having a constant mass, it is necessary to remove from their "old" models the mu-neutrinos, which change their number in different nucleons. True, this will lead to a revision of the reference masses u and d quarks.

We initially set ourselves a taboo (restriction) - reference data of the Standard Model "do not touch" (!). But now we have to ask yourself, and what data are reference (?). Experimental - YES (!), But the "reference" masses u and d quarks are not experimental, but calculated on the basis of certain mathematical models, and reference ones can be considered only conditionally (!).

Therefore, we decided to intervene in the matter of calculating the masses of u and d quarks and propose a new scheme for the structuring of simples in S-models of nucleons.

A new scheme of S-models of quarks and structuring of nucleons:

1) quarks d(ST) and u(ST) can be regarded as fragments of the "hoop of quarks" from 2Sd- and 4Su+, with their mass being constant at 0.1426625 MeV and 0.1570705 MeV, respectively. We supplied the new quarks with the "ST" indices, in order to distinguish them from the quarks of the Standard Model. The initial role of quarks is to pull together the bagels of mu-neutrino and tau-neutrino into single stable "aggregates" - nucleons. The secondary role of quarks is the formation of gap magnets, which pull together nucleons into the nuclei of isotopes.

2) tau-neutrinos in the amount of 60 pcs. plays the role of a kind of "shell" of all nucleons, their number and mass are constant.

3) mu-neutrinos, with a maximum of 61 pcs. in the relic neutron and a minimum of 9 pcs. in the iron isotope 56Fe, play the role of an expendable material providing a defect of mass of nucleons in all nuclear reactions.

Notes:

1. It would be tempting to consider the simples Sd- and Su+ themselves as quarks, but they did not "meet" with us alone in any S_model of base particles, and therefore this option is probably not realistic. This means that the quarks themselves are compound particles consisting of blocks of several simples-spirales (2Sd- and 4Su +) of approximately the same length (42.46d and 44.65d) and about the same mass (0.144266 MeV and 0.1517065 MeV) . This length of quarks is determined by some objective circumstances related to the stability of these particular structures (blocks) at the time of education of relic neutrons.

2. On the other hand, the scheme for the formation of quarks from simples-spirales with "open" ends emitting powerful magnetic vortices predetermines the instability of the existence of quarks in the free state, and the presence of a strong magnetic field at the ends of the quarks makes them superactive in terms of finding partners. Taking into account the fact that this magnetic field bends the quark spiral into an arc (approximately 120 °), the triad of quarks forms a stable toroidal structure, which we "observe" in the composition of nucleons. Quark doublets (two 120 ° arcs) are also found in mesons, but since such a design is not balanced (from the point of view of conjugation of electro-magnetic vortices), mesons as a result are unstable virtual particles.

3. Other combinations of simples, into which quarks enter, are likely to form also. Thus can be formed both stable particles and unstable particles can form. We do not know the other stable particles, which contain quarks as part of the matter, they may be part of the dark matter, which we will discuss in one of the following chapters of our work. Unstable particles containing quarks are formed in a set in reactions on accelerators, when particles of matter break up into free simples and from them can form "what", and this "what" exists short time, and then either decays (shortens) or burns out in the "furnace" of annihilation, or is transformed into stable particles.

It was necessary to begin with this, and not "fool your head" in steps and iterations, most readers will exclaim, who have long understood where we are going.

Do not agree. First, we had to start from something, and this is certainly the reference mass of u and d quarks in SM.

Secondly, in the process of developing S_theory, in our reasoning we "walked" about the described "path" (steps and iterations) and we found it possible to share with you our "torments".

Step 6 (iteration 3) - calculation of the mass of the relic neutron, reference proton and reference neutron under the new scheme

In the course of the description of the process of form of relic neutron formation (Chapter 2), we have already noted that the relic neutron contains 61 pcs. mu-neutrinos, justifying this by the following distribution of the mu-neutrino from fragments of the "quark hoop"; 21 pcs. on the 4Su + block (length 44.6486126d) and 20 pcs. mu-neutrino on the 2Sd-blocks (length of 42.4588789d).

The calculation allows us to give one more justification for the number of mu-neutrinos (61 pieces) in a relic neutron. At the 4th step we calculated that the reference proton contains 53 pcs. mu-neutrinos. In the second chapter we deduced the S_formula of the β-decay of the relic neutron to the reference proton and electron, according to which 8 pcs mu-neutrinos should burst. The addition of these two numbers (53 + 8 = 61) shows that the relic neutron had to contain 61 pcs. mu-neutrinos.

This allows us to calculate the mass of the relic neutron, composing the following S_formula of its composition:

nr(calc) = 60 * ντ + (20 * νμ(calc) + 2 * Sd-) + (21 * νμ(calc) + 4 * Su+) + (20 * νμ(calc) + 2 * Sd-) = 60 * ντ + 61 * νμ(calc) + 4 * Su+ + 4 * Sd- = 60 * 15.4662563 + 61 * 0.18582935 + 4 * 0.037926625 + 4 * 0.0772133125 = 939.75120755 MeV

The concept of a relic neutron was first introduced in S_theory, accordingly the values of its mass did not yet exist, we now calculated this mass.

Very interesting is the question of whether relic neutrons can meet anywhere in the Universe in our time and whether they can be touched. At first glance, no. After all, the relic neutrons that arose after the Big Bang had to decay into protons and electrons or take part in the primary nr-nucleosynthesis of the isotope spectrum, while they necessarily lose part of the mu-neutrino and turn into secondary protons and neutrons with a smaller number of mu-neutrinos.

However, there may be "variants", so we will return to the question of the possible location of relic neutrons in the modern Universe at the end of the fourth chapter, in which we will analyze the process of nr_nucleosynthesis of the spectrum of isotope atoms from relic neutrons.

It is more difficult to give the detailed S_formulas of the reference neutron and the reference proton. The fact is that we do not know where the mu-neutrinos bursted and how the remaining mu-neutrinos are distributed over the fragments of the "quark hoop".

In fact, in describing the process of disintegration the relic neutron into a reference proton, we explained that the mu-neutrino could fall into the gap between two d quarks, while it bursts, a micro-blast occurs, as a result of which a total of 8 pcs mu-neutrino and two d_quarks bursted (break up into simples). Then a doublet of new u_quarks and d_quarks (confinement) is formed from the burst mu-simples, which restore the triad of quarks and collect 32 pcs. mu-neutrino which remain as whole mu-neutrinos related to these two quarks. But here's how these 32 pcs. mu-neutrinos are distributed over new quarks - is unknown.

The same can be said about the process of transforming a relic neutron into a reference neutron. Relic neutron under the action of dipole moments approaches the reference proton, forces of strong interaction of slit magnets begin to act at a certain distance, which are pulled together by nucleons, as result into the relic neutron 1 pcs mu-neutrino bursted. But in this case there is no rearrangement of the triad of quarks. But in what place (on which fragment) this 1 pcs mu-neutrino bursted is unknown.

Therefore, we can write down the final S_ formulas of the reference proton and the reference neutron only in the following form:

p(rec) = 60 * ντ + 53 * νμ + 4 * Su+ + 4 * Su+ + 2 * Sd-

n(rec) = 60 * ντ + 60 * νμ + 4 * Su+ + 2 * Sd- + 2 * Sd-

The prefixes of "calc" in the above formulas have been removed.

To some extent, we have returned to the concept of socialized mu-neutrinos; only now we know that they are all distributed over all the fragments of the "hoop of quarks", and their number on each fragment initially corresponds to the length of these fragments.

We substitute the values and calculate the masses of the reference proton and neutron:

p(rec) = 60 * 15.4662563 + 53 * 0.18582935 + 8 * 0.037926625 + 2 * 0.072133125 = 938.272013 MeV

n(rec) = 60 * 15,4662563 + 60 * 0,18582935 + 4 * 0,037926625 + 4 * 0,072133125 = 939,5653782 MeV

The obtained values converge with the values of the reference proton mass (the nucleus of the hydrogen atom) and the reference neutron (the neutron in the deuterium atom).

In the next chapter , devoted to the primary nr_nucleosynthesis of the isotope spectrum, we calculate how many mu-neutrinos burst at each step of the primary nr_nucleosynthesis and how many mu-neutrinos remained in the subsequent generations of protons and neutrons in the nuclei of isotopes and an average of one nucleon.

Step 7 - calculation of the sizes of simples and the formed base particles.

The lengths of the simples in d were determined in step 4, now we need to determine the unit of measurement for these lengths (d).

In fact, we need to determine with some known size of elementary particles, which would be equal to or as close to the diameter of the spirals of simples.

The first way to calculate d.

From the second chapter of the article, in which we described the processes of particle formation, it follows that the most suitable for these purposes are electron antineutrinos, whose S-model is the remainder of some number of TEV turns of the shortening simples-spirales.

It is known from experimental data that the cross section for the interaction of an electron neutrino (antineutrinos) with matter is in the range from 10^{-34} to 10^{-43} cm^2 [7]. The difference in the cross section of 9 orders of magnitude can be interpreted as follows:

the maximum value (10^{-34} cm^2) is the area of the square described around the diameter of the neutrino bagel (view in the face),

and the minimum value (10^{-43} cm^2) is the area of the rectangle when viewed on the neutrino from the side (profile view).

Then the diameter of the neutrino (d) can be estimated as the square root of the maximum interaction cross section, i.e.

d = Square root (10^{-34} cm^2) = 10^{-17} cm = 10^{-19} m = 10^{-4} fm = 0.0001 fm

The second way of calculating d.

Knowing the length of Sτ = 2275.930452 (d), let's define the diameter of the bagel Sτ:

diameter of bagel Sτ = 2275.930452 / 3.1415926 + 1 = 725.45118 (d)

At step_1, we already calculated the diameter of the lumen (hole) in the proton (neutron) donut:

diameter of the lumen (hole) in the proton = 38.197 - 1d = 37.197 (d)

We now calculate the outer diameter of the proton (neutron) bagel:

outer diameter of the proton bagel = 2 * 724.45118 + 37.197 = 1488.099 (d)

The proton size most commonly used in calculations, determined experimentally back in the 1960s, is 0.8768 fm. This proton size is determined by the method of measuring the energy of photons emanating from an excited hydrogen atom containing a proton and an electron.

Relatively recently in 2010-2012, these measurements were performed in a series of experiments on muonic hydrogen and gave a proton size equal to 0.8404 - 0.8418 fm [8]. Scientists did not find an exact explanation of where the difference in 4% came from. Studies on this issue will continue. We in our calculations use the "old" reference proton size equal to 0.8768 fm.

Proceeding from the indicated proton size, we find the value of the parameter d (by proton):

d = 0.8768 / 1488.099 = 0.0005892 fm

Selecting the "correct" value d.

As we see from both variants, the value of d turned out to be of the same order, which indicates the correctness of the S-models we have constructed.

Preferring the option of calculating the parameter d based on the proton size, as the directive value d, we take the value 0.0005892 fm.

Now we can calculate the external diameters of tau-neutrinos, mu-neutrinos, electrons and nucleons from their S_models in fm:

diameter of the tau-neutrino (bagel Sτ) = 725.45118 * 0.0005892 = 0.427436 fm

diameter of the mu-neutrino (bagel Sμ) = (27.34563997 / 3.1415926 + 1) * 0.0005892 = 0.00572 fm

diameter of the electron (bagel Se-) = (25,065276682 * 6 / 3,1415926 + 1) * 0,0005892 = 0,02879 fm

diameter of the proton and neutron = (2 * 725.45118 + 37.197) * 0.0005892 = 0.8768 fm

diameter of the lumen (hole) in the proton (neutron) bagel = 37.197 * 0.0005892 = 0.022 fm

thickness of the proton (neutron) bagel = 725.45118 * 0.0005892 = 0.4274 fm

Comment on the received values:

Let's start with the size of a proton and a neutron

It is known that the reference dimensions of the proton and neutron are different and are 0.8768 and 0.89 fm, respectively. According to our S_models they should be the same. The question arises - why is the reference size of the neutron larger than the reference size of the proton (?).

In our opinion, the difference is in the methods used to determine the dimensions of the proton and neutron. The reference neutron size was calculated in a completely different way (than the proton size), by method based on the radius of the neutron magnetic moment distribution [9]. The difference in methods, we believe, explains the difference in the reference sizes of the proton and neutron.

Now about the size of an electron

About the size of an electron so much is written and said, but the only "generally accepted" is the classical radius of an electron

r_0(e-) = 2,81794 fm,

calculated by Thompson according to the method of equating the energy of the electrostatic field of a spherical electron (e^2 / r_0) to its rest energy (m(e-) * c^2).

Our electron size turned out to be two orders of magnitude smaller (0,02879 fm). Why?

The fact is that the Thompson model of the electron is fundamentally different from the electron model in S_theory. Let's list these differences:

1) in S_theory, the electron has the form of a torus, and not a sphere;

2) the electric charge of an electron in S_theory can be geometrically identified with an azimuthal electric vortex gathered on the inner diameter of the electron torus, and not distributed uniformly on the surface of the sphere;

3) the mass of an electron in S-theory is identified, basically, with a magnetic vortex inside the torus of the electron, and not with its Coulomb energy.

Therefore, we will not dramatize the resulting inconsistency of the classical size of the electron and the size of the electron according to S_theory, because both values are computational for certain models, and still require their experimental verification.

Notes (Insert as of 10/16/2017):

1. In early October 2017, a series of news about new research confirming the smaller size of the proton [33]. A new value of 0.84184 fm is called.

We did not begin to change, the calculation we made for the sizes of simples. For our further estimates of nuclear sizes, neutron stars and black holes in S_theory, this change in proton size is not of a fundamental nature and does not affect the conclusions and consequences.

2. In Wikipedia, in the article "Atom", referring to a number of papers, a completely different electron size is given: "Experiments on the ultra-precise determination of the magnetic moment of an electron (1989 Nobel Prize) show that the electron does not exceed 10-20 cm." in units of fm, this is 10^{-7} fm. Our estimate of the electron size by ST is between this size and the size calculated by Thompson. We believe that all these discrepancies are related to different models of the electron.

Step 8 - calculate the ratio of the energy of magnetic and electric vortices in the simples

We have already used the image of a simple-bagel as a rubber toroidal expander for training hands.

With reference to the simples, our "expander" consists of two parts - an internal one, filled with a magnetic vortex, and an outer "shell" filled with electric toroidal vortices.

Phenomenologically, we assume that all the vortices are in a "tightly packed" (compressed) state having the same density (parallel vortices are attracted). In this case, the energy of the magnetic and electric vortices, if considered separately, will be proportional to the volumes occupied by these vortices. Let's put the problem - to calculate (give an estimate) their ratios.

The easiest way to solve this problem is to use the example of a cylindrical-shaped simple-spirale (see Figure 3-1), where t is the thickness of toroidal electric vortices ("shells" of the simple).

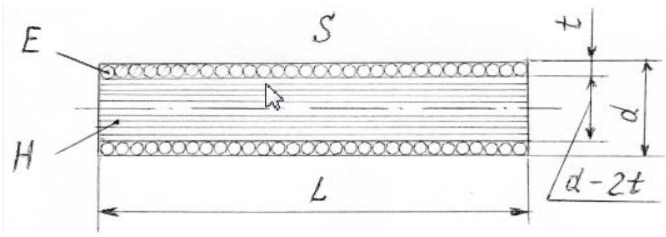


Fig. 3_1. The internal structure and dimensions of the simple-spiral

Then, the energy of the magnetic vortex of the simple will be proportional to (d-2t) 2, and the energy of the electric vortices of the simple will be proportional to [d2 - (d-2t) 2].

We have already defined the parameter d (see step 7).

To estimate the value of the parameter t, we use the minimum value of the cross section for the interaction of the electron neutrino (antineutrino) with matter equal to 10-43 cm^2 (10-17 fm2). Dividing this value by the parameter d (the diameter of the neutrino), we obtain the thickness of the neutrino bagel in the profile, which is equal to the diameter of the circle forming the torus of the neutrino bagel (see Fig. 3_2).

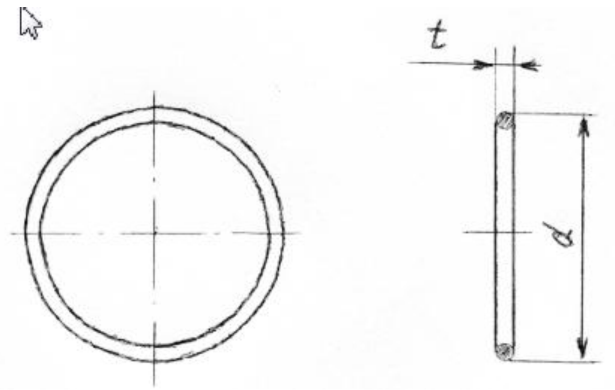


Fig. 3-2. Dimensions of a neutrino bagel (antineutrino bagel)

We take this size for the maximum size of the "shell thickness" of toroidal electric vortices, then:

t = 10-17 / 0.0005892 = 1.7 * 10^{-14} fm

Substituting the values of d and t in the formulas, we find the ratio of the energy of the magnetic and electric vortices of the simples:

H / E = (d-2t) 2 / [d2 - (d-2t) 2] = 8.68 * 10^{9} ≈ 10^{10}: 1

As we can see, all the energy of the simples is concentrated, in practice, in the energy of the internal magnetic vortex of the simple, which fully confirms the postulate we adopted, which identifies the mass of simples with the energy of its magnetic vortex.

Conclusion of Chapter 3

We finished the calculation of the parameters of the basic simples, explaining where their values came from, given in the table in the second chapter of the article.

You remember that with these values we illustrated S_models of the main particles, of which all matter is built.

The calculated parameters of the simples and the constructed S-models are basically consistent with the reference and experimental parameters of the basic particles of matter, such as mass, dimensions, charges.

Additional parameters of the simples (magnetic moment, stability), the values of which we did not determine, directly participate in the formation of the main particles of matter and give them the appropriate properties. The determination of the values of these additional parameters of simples requires additional studies.

And one more important conclusion is that, as the largest and average "kettlebell" in the building of the S-model of the relic neutron, we adopted tau-neutrinos and mu-neutrinos, proceeding from the principle of not inventing new entities, if we can do with existing ones. As a result, we were able to pick up (compute) a set of parameters of the basic simздуs confirming the "operability" of the assumption made about the occurrence of tau- and mu-neutrinos in the composition of S_models of nucleons. True, this variant of S_models leads to a revision of the reference quark masses u and d (0.15707065 and 0.14262625 MeV, respectively).

In the proposed S-models, the contribution of gluons to the mass of nucleons is also radically revised. The main mass of nucleons is tau-neutrinos.

Differences ST from SM:

The control calculation of the parameters of the main particles of matter on the basis of their S_models and the parameters of the simples revealed two contradictions (inconsistencies) in the obtained ST data with the data of the Standard Model:

1) The known reference values of the masses u_quark (2.01) and d_quark (4.79) agree with the S_models of the neutron and proton only in the form of an inseparable triad of quarks, which in addition to the "hoop of quarks" also contains a "necklace" from the corresponding number of mu-neutrino (53 pcs for the reference proton and 60 pcs for the reference neutron). Taking into account that the mu-neutrinos are an expendable material providing a mass defect in all nuclear reactions, these masses of u and d quarks are maximal and decrease as the mu-neutrino bursted. The proposed variant of S_models quarks without taking into account the mu-neutrinos requires correction of the reference quark masses. The calculated variant of such an adjustment (excluding the mu-neutrinos from the quark composition) allows us to consider quark d and u fragments of the "hoop of quarks" from 2Sd- and 4Su+, while their mass will be constant at 0.1426625 MeV and 0.1517065 MeV, respectively.

This difference is due to the fundamental difference between the models of nucleons in SM (triad of quarks + gluon cloud) from S_models of nucleons in ST (60 pcs of tau-neutrinos + variable amounts of mu-neutrinos + triads of quarks + gluon flagellums).

Taking into account the negligible time for the free existence of quarks (blocks of simple-bagels) in an autonomous state (before combining into various bagels), it is probably impossible to measure quark masses by direct experiments. Therefore, this discrepancy between the models and the values of the quark masses can be solved only by checking the consequences of these theories and models. In one of the last chapters of the paper, we give a complete list of ST differences from SM and the consequences and conclusions arising from S_theory, which require experimental verification.

2) The size of the electron calculated from the S-model was significantly (by two orders of magnitude) smaller than the classical Thompson radius of the electron. We attribute this difference to the essential difference between the Thompson model of the electron and the S-model of the electron. This issue also requires additional research and experimental verification.

The calculated parameters of the simples allowed us to estimate the ratio of the energy of the magnetic and electric vortices of the simples as 1010: 1, which confirms the postulate we adopted, which identifies the mass of simples with the energy of its magnetic vortex.

Chapter 4. Primary nr_nucleosynthesis of the spectrum of isotope nuclei (main stream)

We discussed the formation of simples and the construction of basic particles of matter (neutrons, protons, electrons) from them. It's time to talk about the formation of isotopes from these particles.

It would seem, what to talk about here, the simples have done their work, nucleons and electrons have formed from them with the values of the basic parameters equal to the reference ones, well, let them further assemble into nuclei and atoms, as described in well-developed theoretical models, and observational data.

But, we can not start this process "by oneself", because the knowledge of the S_structures of nucleons gives us unique opportunities in a new way, "from the inside" to look at the process of formation of the spectrum of isotope nuclei. We will consider this a test of S_theory.

But, first, let's briefly recall the traditional model of the formation of atomic nuclei.

The traditional model of the formation of atomic nuclei (nucleosynthesis)

The world around us consists of ~ 100 different chemical elements, most of which are represented by several isotopes that have the same number of protons and differ from each other in the number of neutrons.

E. Burbidge, G. Burbidge, V. Fowler, F. Hoyle in 1957 gave a detailed description of the main evolution processes in which the formation of atomic nuclei of isotopes took place. Below is a list of these processes from the source [10] with some abbreviations:

1. Cosmological (pre-stellar) phase of hydrogen formation.

2. Cosmological (pre-stellar) phase of hydrogen burning and formation of 4He nuclei (90%) and nuclei of some other light isotopes. The mechanism of the pre-star formation of helium quantitatively explains the prevalence of helium in the Universe. Heavier nuclei were formed as a result of nuclear reactions that occur during the burning of stars.

3. The stellar phase of hydrogen burning and the formation of 4He nuclei (10%) and the nuclei of some other light isotopes.

4. Helium burning. As a result of the 4He + 4He + 4He reaction, 12C nuclei are formed.

5. α-process. As a result of successive capture of α-particles, the nuclei 16O, 20Ne, 24Mg, 28Si, ... are formed.

6. The e-process. When the temperature reaches 5 · 109K, a large number of various reactions occur in the stars under thermodynamic equilibrium conditions, as a result of which atomic nucleus are formed up to Fe and Ni. The nucleus with A equal to about 60 units are the most strongly bound atomic nucleus. Therefore, they terminate the chain of nuclear reactions synthesis, accompanied by the release of energy.

7. s-process. The nuclei heavier than Fe are formed in the reactions of successive neutron capture. Very often, a nucleus that captures a neutron turns out to be β-radioactive. Before the nucleus captures the next neutron, it can decay as a result of β-decay. Each β-decay raises the atomic number of atomic nuclei per unit. If the time interval between successive neutron captures is greater than the β-decay periods, the neutron capture process is called the s-process (slow). Thus, the nucleus as a result of neutron capture and subsequent β-decays becomes heavier, but it does not go too far from the stability valley on the N-Z diagram.

8. r-process. If the rate of successive capture of neutrons is much greater than the decay rate of the atomic nucleus, then it succeeds in capturing at once a large number of neutrons. As a result of the r-process, a neutron-rich nucleus is formed, far removed from the stability valley. Only then, as a result of a successive chain of β-decays, it turns into a stable nucleus. It is usually assumed that r-processes occur as a result of supernova explosions.

9. The p-process. Some stable neutron-deficient nuclei (the so-called bypassed nuclei) are formed in reactions of proton capture or in reactions under the influence of neutrinos.

10. Synthesis of transuranium elements. In the solar system, only those chemical elements whose lifetime is longer than the age of the solar system are preserved. This is 85 chemical elements. The remaining chemical

elements were obtained as a result of various nuclear reactions at accelerators or as a result of irradiation in nuclear reactors. Synthesis of the first transuranium elements in the laboratory was carried out with the help of nuclear reactions under the action of neutrons and accelerated α-particles. However, further advancement to heavier elements proved to be practically impossible in this way. To synthesize elements heavier than Mendelium Md (Z = 101), nuclear reactions with heavier multiply charged ions - carbon, nitrogen, oxygen, neon, calcium - are used. Accelerators of multiply charged ions began to be built to accelerate heavy ions.

What can be said about this scheme for the formation of the spectrum of isotopes (?). Very difficult! This description of the nucleosynthesis process is more like a list of all types of nuclear reactions.

There is no doubt that all these reactions take place in the material world in fact and occurred earlier. But that, the process of primary formation of the spectrum of isotope nuclei can not do without one of them, raises a number of questions.

In particular, why does the synthesis process, starting with the mechanism of neutron attachment to a proton with a periodic beta-decay of a neutron, then "throw" this mechanism, go to the mechanism of thermonuclear fusion (TNF, α-synthesis, etc.), and then, after synthesis of iron (Fe), again returns to the mechanism of neutron capture with periodic β-decay (?).

Moreover, this scheme, if you listen to other sources [11] is not complete. It should add the existence of two or even three generations of stars with different conditions for the synthesis of different groups of elements.

The question arises: is it possible to simplify this scheme in some way (?) And whether there are any grounds for doing this (?).

S_theory answers these questions positively.

ST_Cosmological model (part 2) of primary nr_nucleosynthesis of the spectrum of isotope nuclei.

In the source [10], describing the traditional Cosmological model of the formation of isotope nuclei, there is such a phrase:

"To explain the formation of chemical elements in 1948 G. Gamow proposed theory according to which the synthesis of all chemical elements occurred during the Big Bang as a result of nonequilibrium capture of atomic nuclear forces with the decay of γ-quanta and the subsequent β-decay of the nuclei formed. However, calculations have shown that in this model it is impossible to explain the formation of chemical elements heavier than Li. It turned out that the mechanism for the formation of light nuclei (A <7) is associated with the conditions that existed in the universe during the first three minutes. The heavier nuclei were formed as a result of the election of reactions occurring during the burning of stars. "

This statement, in turn, is based on known experimental data, the duration of the capture processes and their subsequent β-decay, as well as experimental data on the duration of these processes obtained with "modern" neutrons, most of which are depleted the quantity of mu-neutrinos.

According to S_theory, we "know" that after the Big Bang, at the time of the start of the formation of the isotope nuclei there were not "modern", but only relict neutrons containing the maximum number of mu-neutrinos (61 pcs).

The first act of the process of formation of isotope nuclei was the decay of the relic neutron and its conversion into a reference (standard) proton with 53 pcs. mu-neutrino (the nucleus of atomic hydrogen). At the same time, 8 mu-neutrinos and two quarks d were busted , and two quarks (d + u) and an electron (which together with the proton formed a hydrogen atom) were formed.

The second act of the process of formation of isotope nuclei was the fusion of a reference proton (nucleus of a hydrogen atom) and a relic neutron into a deuteron, the nucleus of a deuterium atom, while in a relic neutron one mu-neutrino busted and it turned into a reference (standard) neutron with 60 pcs. mu-neutrino. Besides in the reference proton 12 mu-neutrinos busted and it turned into a 2nd generation proton with 41 pcs. mu-neutrinos. Thus, an atom of deuterium appeared.

The third, fourth, etc. passed in a similar way. acts of primary nucleosynthesis of isotope nuclei. At each of its stages (step), a new relic neutron joined the already formed nucleus. In this case, under the action of nucleon compression forces (strong interaction forces), deformation of nucleons occurs and a part of the mu-neutrino busted, in the attached relic neutron and in other previously connected nucleons of the nucleus. This process we called the primary nr_nucleosynthesis of the spectrum of isotope nuclei.

The key element in the process of primary nr_nucleosynthesis is the relic neutron, which, due to its "full clip" of mu-neutrinos (61 pcs.) and "constant readiness to give part of them," works as a powerful catalyst capable of joining any nucleus of any isotope, which met on its way.

Due to the special properties of the relic neutron, the time of its capture by nuclei is smaller of the time β-decay of nuclei's . That is why the process of nr_nucleosynthesis can go on in any part of Mendeleyev's table, providing a primary synthesis of the entire spectrum of nuclei of all isotopes.

Proceeding from this scheme, S_Cosmological model of primary nr_nucleosynthesis of the spectrum of isotope nuclei (in traditional terminology - nucleosynthesis) can be briefly represented as a sequence of the following stages:

In the first stage of nr_nucleosynthesis, relict neutrons were formed from simples (see Chapter 2).

In the second stage of nr_nucleosynthesis relic neutrons began to decay into protons and electrons (in equal amounts!), Which formed hydrogen atoms.

Since at the first stage the relic neutrons were not formed at one moment, but over a period of time, respectively, and their decay occurs not at once but "gradually". As a result, a mixture of protons and relic neutrons appears.

The third stage is the primary nr_nucleosynthesis of the spectrum of isotope nuclei by successive addition of relic neutrons to the proton and other nuclei of isotopes formed.

The fourth stage (the stage of the termination of the primary nr_nucleosynthesis of the spectrum of isotope nuclei).

The stage of primary nr_nucleosynthesis of the spectrum of isotope nuclei lasts as long as relic neutrons are available. With the end of the stock of relic neutrons, the process of nr_nucleosynthesis of the isotope nucleus spectrum ends (all relic neutrons decay into protons and electrons or participate in nr_nucleosynthesis and become "modern" protons and neutrons in the isotope nuclei).

In fact, the process of primary nr_nucleosynthesis of the spectrum of isotope nuclei is a process of "recycling" relict neutrons into matter.

General scheme of the process of nr_nucleosynthesis

Approximation of protons and formed nuclei with relic neutrons at "large" distances is facilitated by the presence of dipole moments (E) in both objects. At "small" distances, the magnetic moments of their slit magnets come into operation. The formation of gap magnets in nucleons is described in more detail in the section devoted to the formation of a relic neutron (see Chapter 2).

It should be noted here that in all nucleons (and for relic neutrons, and for protons, and for neutrons), there are three slit magnets, see Fig. 4_1 (a). When protons and relic neutrons converge to distances commensurate with the size of nucleons, three slot magnets of one nucleon find each their "companion" among three slit magnets of another nucleon, "cling" to each other with the help of flagellum gluons, which attract nucleons to each other and form peculiar magnetic latches, firmly holding two nucleons with each other, see Fig. 4_1 (b).

Further, the same procedure is repeated with the next relic neutron, etc. etc. Under the influence of strong interaction forces, all nucleons are pressed against each other, deformed (flattened like rings in a children's pyramid), resulting in an elongated structure resembling a "sausage" with constrictions, see Fig. 4_1 (c).

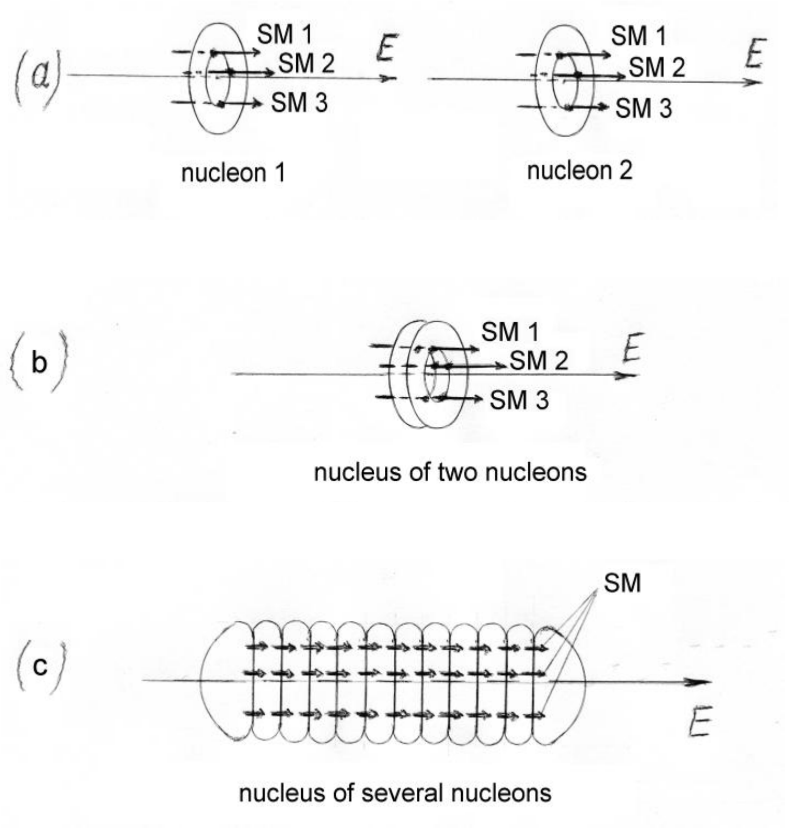


Fig. 4_1. The general scheme of the assembly of nucleons in the nucleus of isotopes (formation of "sausage")

In fact, we briefly described the physical model (S_model) of the action of forces of strong interaction that collect nucleons into the nuclei of atoms. The growth of nuclei (the formation of the spectrum of isotopes) proceeds by the successive addition of relic neutrons. At the same time, some of the relic neutrons are converted into protons, and some of the relic neutrons are converted into "simple" neutrons, and in either case a part of the mu-neutrino bursted.

We draw your attention to the fact that this is so far only a general scheme for the assembly of nucleons into the isotope nuclei. Further, using S_analysis of the S_model of the given process, we will find a number of other features that affect the number of bursting mu-neutrinos and by the magnitude and direction of the forces of strong interaction between different slit magnets, that ultimately affecting the structure and final form of the nuclei.

Special attention in the presented scheme deserves the fact that there is no electric charge in the relic neutron. This allows him to freely approach the protons and the nuclei and to interact with them in a strong interaction. What can not be said about the variants of proton collisions with nuclei between themselves, because they have the same electric charge. This circumstance sharply limits the probability of such meetings and channels the entire process towards meetings with relic neutrons.

Of special interest is the question: "When do the nuclei of isotopes capture electrons (formed during the decay of relic neutrons) and turn into atoms?" Does this happen in parallel with the process of nucleosynthesis or is it a separate Cosmological stage?

In the variant nr_nucleosynthesis by S_theory, it seems that this process may well go in parallel with the process of nucleosynthesis.

The complete model of atoms (isotopes) according to S_theory (ST)

The above cosmological model and the general scheme of the primary nr-nucleosynthesis of the isotope spectrum give the only general idea of the "construction" and internal structure of the nuclei. We are faced with the task, based on this structure, to calculate the entire process of primary nr_nucleosynthesis of the isotope spectrum.

First, let's recall the structure of the isotopes and their nuclei in the Standard Model. In SM, the isotopes consist of a nucleus and electrons that rotate along the orbitals around the nucleus (the planetary model of atoms). The nuclei of atoms consist of nucleons (protons and neutrons). Nucleons consist of three quarks and gluons. The bulk (energy) of the nucleons is accounted for by gluons, exchanging which at distances commensurable with the size of the nuclei, the nucleons enter into a strong interaction, which unites them into the nuclei of the atoms. Electrons are held in orbitals by forces of electromagnetic interaction with the nucleus, exchanging photons with it.

The model of atoms (isotopes) for ST at the level of the presence of the nucleus and the electron shell corresponds to the planetary model for SM. The nuclei consist of nucleons. The number of quarks in each nucleon coincides (three). The "working bodies" that provide the connection between the nucleons are gluons. But further the differences begin:

1) The nuclei of atoms (isotopes) are a "sausage", formed from a chain of nucleons, which are toroidal aggregates.

2) All nucleons consist of six kinds of simples (Sτ+/-, Sμ+/-, Su +, Sd -), combined in turn into four types of "blocks":

- Two toroidal simple-bagels Sτ+ and Sτ - are combined into a torus-like "block" of tau neutrinos.
- Two toroidal simple-bagels Sμ+ and Sμ - are combined into a torus-like "block" of mu-neutrinos.
- Four simples-spirales of Su + are combined into an arc-shaped "block" u_quark.
- Two simples-spirales Sd - combined into an arc-shaped "block" d_quark.
- Three "blocks" of quarks (2u + d or u + 2d) form a toroidal "quark hoop", collecting "blocks" of tau neutrinos and mu-neutrinos into a single toroidal nucleon aggregate (like beads).

3) Inalienable elements of each nucleon are three slit magnets "attached" to three quarks, and formed by their azimuthal electric vortices. The internal cavity of the slit magnets is "supported", the mu-neutrino in the amount from 3 to 21 pcs. on each slit magnet.

4) The "working body", which transmits the interaction between the slit magnets, is the flagellum (garland) consisting of gluons-SIF or g(SIF). Gluons _SIF are single electrical vortices with magnetic moments. Gluons are formed from "toroidal electric vortices" that are "thrown off" when the simples-spirales are shortened.

The "efficiency" of slot magnets and flagellums of gluons_SIF increases as the mu-neutrino bursts and the formation of through holes in the slit magnets of neighboring nucleons. The joint "work" of the slit magnets and the flagellums of the gluons_SIF is a physical realization of the forces of strong interaction (SIF) and is purely electromagnetic in nature.

5) By analogy with the flagellums of gluons transferring the interaction of SIF, as physical realization of the transfer of the classical electromagnetic interaction between electrons and the nucleus of the atom, S_theory considers flagellums OF the virtual photons (VP) formed from virtual photons (in the version of micro-dipoles). At the same time, one should keep in mind that virtual photons for VP flagellums are "taken" not from simples or products of their decay, but from the surrounding "space" (the process of VP formation in space will be considered in the chapter "Fourth physics").

Imagine that electrons that fly in orbitals almost at the speed of light are "tied" to the core by some "flagellates", not simply (someone, perhaps, will say "delirium").

But remember the real photons flying past the stars and warp their trajectory - they are exactly flying at the speed of light, but, despite this, they manage to interact through the "gravitons" with the mass of the star and their speed is not a hindrance.

If we imagine that the space between the electrons and the nucleus inside the atom (and in general the whole space) is filled with virtual photons (we already did this at the stage when simples were born), then the power flagellums from virtual photons providing the electromagnetic interaction between the electrons and the nucleus need not be "real" objects. They can "line up" and burst, "line up" and burst, i.e. be "kind of virtual," especially since the photons themselves, which form these flagellums, are also virtual. The main thing is that they manage to "twitch" the electron, give it a centripetal acceleration and direct its trajectory along the corresponding orbitals.

6) The formation of the spectrum of atoms (isotopes) in the primary nr_nucleosynthesis is accompanied by the addition of three kinds of particles from the isotope: electron-antineutrinos, gamma quanta and free gluons (gF), which turned out to be "superfluous" in the formation of flagellums from gluons-SIF.

Next, we need to calculate the change in the amount, mass (energy) of all the constituent isotope components during the primary nr_nucleosynthesis of the isotope spectrum, and perform an analysis of the results obtained.

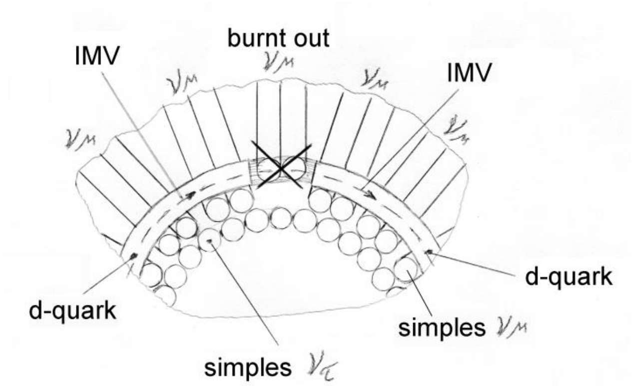
But in the beginning, we must deal with variants of the mu-neutrino bursting processes in the reactions of nr-nucleosynthesis.

Analysis of variants of mu-neutrino bursting processes for nr_nucleosynthesis (S_formula of processes)

We have already discussed in detail the cause and consequences of mu-neutrino bursting during the decay of a relic neutron. As a reason, we then established the gap of a spontaneous increase in the gap between the quarks d and the "dip" into this gap of the mu-neutrino. In this case, a "burnout" of the failed "mu-neutrino" by a powerful magnetic vortex of the "hoop of quarks" occurs, which results in a "microexplosion" inside the relic neutron and its transformation into a proton. It must be noted that this process occurs spontaneously, without any external influence. All simples or blocks of simples before bursting of the mu-neutrino in the gap between two quarks d retain the shape of ideal round tori (bagels).

We call this process the first variant of mu-neutrino bursting, see Fig. 4_2 (a) and give it the S_formula derived in Chapter 2, introducing in it the necessary refinements concerning the formation of gluons_SIF and free gluons_F, Fig. 4_2 (b):

(a) is a diagram of the first variant of mu-neutrino bursting



(b) - S_formula of the first version of the mu-neutrino bursting

2*2S⁻ confinement annihilation

$$u + (d + d) + 8\nu_\mu \rightarrow u + (u + d) + e^- + g + (2{*}2S^- + 4{*}S^+) \rightarrow u + (u + d) + g\mathrm{SIF} + e^- + 2(\underline{\nu}_e + \gamma) + g\mathrm{Fr}$$

$4S^+$, $2S^-$, $6S^-$, $4S^+$

Fig. 4_2. The first version of the mu-neutrino bursting and its S_formula

(decay of the relic neutron)

If we exclude the quark u from the S_formula, which remains intact, and do not map the symbol transitions, then the S_formula takes the following collapsed form:

$8\nu\mu + 2d \rightarrow (u + d) + e- + g(SIF) + 2\ (\nu e + \gamma) + g(F)$

In the traditional form this means:

$nr \rightarrow p + e- + g(SIF) + 2\ (\nu e + \gamma) + g(F)$

The last record, in principle, contains all the information that S_formula in its expanded form, you just have to learn to "read" the information hidden in it. In what follows we shall use the S_formula in abbreviated form.

Here we can once again notice that the number of pairs (νe + γ) is determined not by the number of positive and negative symbols, but by the number of non-breaking 2S- or 4S + blocks received for annihilation. For this variant it is constant and equal to two blocks 2S-, as a result, exactly two pairs (νe + γ) are formed.

In the decay of the relic neutron, the mu-neutrinos burst precisely according to this variant. In this case, considering that the decay of relic neutrons occurs without external influences, the conditions for mu-neutrino bursting are stable, and as a result, the number of bursting mu-neutrinos is always const (8 pcs - that is, all the formed standard protons are equal to each other). As a result of the decay, an electron, two pairs (νe + γ) and some "heap" of gluons are additionally formed, some of which (gluons_SIF) form flagellums, which at one end are attached to slot magnets and are part of the mass of the isotope 1H. The remaining free gluons_F go to "free swimming".

Other varieties of mu-neutrino bursting:

The processes of mu-neutrino bursting in the first variant can also occur when a relic neutron is added to the nucleus of any isotope during primary nr_nucleosynthesis, which leads to its transformation into a proton and the formation of the nucleus of the next element according to the periodic table.

However, this scheme of mu-neutrino bursting is not enough to explain all the steps of nr_nucleosynthesis. The point is that this mu-neutrino bursting scheme always leads to the destruction not only of the mu-neutrino, but also of two quarks d, into the gap between which the mu-neutrino has failed, and therefore there will necessarily be a replacement of two quarks d by quarks (d + u) and as a consequence the formation of a proton. But there are steps nr_nucleosynthesis, in which quark changes do not occur, the relic neutron remains a neutron, but according to S_theory the mu-neutrino must still burst. What kind of mechanism makes mu-neutrino to play in this case?

Here we must pay attention to the fact that the "external" conditions in which the nucleons are located at the second and subsequent steps of nr_nucleosynthesis are fundamentally different from the external conditions for the decay of the relic neutron. The relic neutron does not undergo any external influences during decay, it itself is a toroidal "aggregate" consisting of toroidal elements. The shape of all toroidal elements, including to the tau- and mu-neutrino, and also the quark hoop torch, is absolutely round.

But in the next steps of nr_nucleosynthesis, the toroidal "aggregates" of nucleons are under the influence of the mutual attraction forces (SIF) of their slit magnets (SM).

When describing the properties of simples, we noted that they have hardness and elasticity, and with external action they are able to deform their toroidal shape depending on the points of application of forces. The diameter of the simple body (dimension d) does not deform (it remains rigid). The shape and external diameter of the simples of tau- and mu- neutrino are deformed.

When the nucleons are attracted to each other, the attractive forces of the slit magnets are attached (in a simplified version) to the "quark hoops" with which the slot magnets are firmly connected.

And the forces of elastic repulsion at the initial instant of contact of the nucleons arise at the points of contact of the tau-neutrino bagels, as shown in Fig. 4_3 (a).

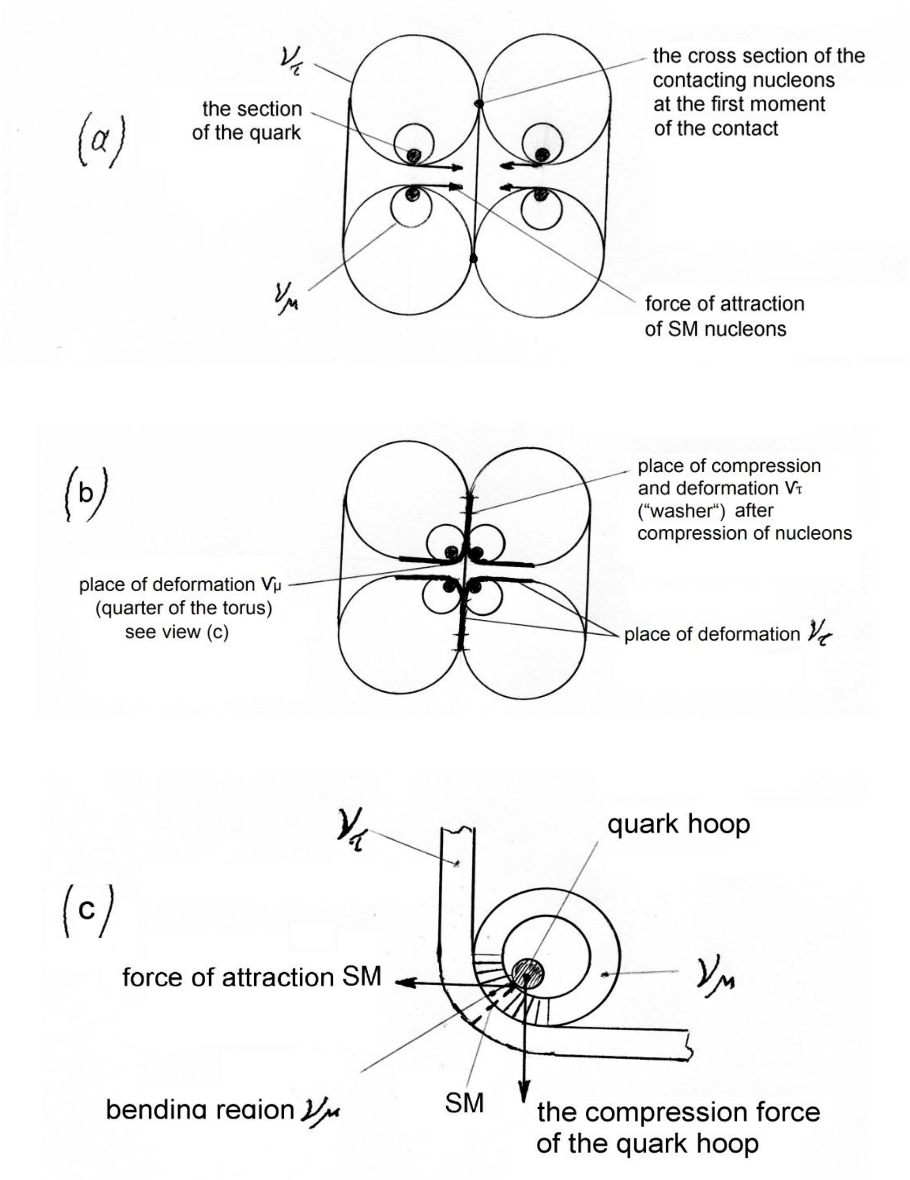


Fig. 4_3. Deformation of nucleon simples in the assembly of nuclei in the reactions of nr_nucleosynthesis

If the simples and, accordingly, the bagels of the nucleons were absolutely rigid, then this picture would be unchanged. But the simples and bagels of nucleons can deform, so the process of attraction of slit magnets leads to deformation of the toroidal shape of the nucleons.

At the initial moment of contact of nucleons, three pairs of slit magnets were already formed, which "earned full power", and so on. they are inseparably attached to the fragments of the "quark hoops" of the nucleons, they pull these "quark hoops" to each other.

Moreover, the arrangement of SM in the "aggregate design" of nucleons is asymmetric, they are shifted to the "bottom" of the toroidal "aggregate" (to the inner diameter of the pseudo-bagel nucleon). As a result of their attraction, there is a deformation of the toroidal form of the simples that form the tau-neutrino, into an asymmetric oval, see Fig. 4_3 (b). The resulting picture resembles four balloons, strung together for strings to one point.

The ratio of the diameters of the simples in the figure is respected relatively (not to scale), in fact, smaller objects are even smaller. The above depiction of the deformation of the simples of nucleons is conditional. We must not forget that the torus-like aggregates of nucleons are in fact formed by the "fan" of their 60-dual-bagels of tau neutrinos, between which "wedges of emptiness" are inserted (see Figure 2-6). The image would correspond to reality if the tau-neutrino bagels of two nucleons were located absolutely opposite to each other. Actually, one should think, at a distance exceeding the diameter of the mu-neutrino, the tau-neutrino bagels "fall through" one another. This, of course, modifies the pattern of deformation of the simples beyond the limits of the diameters of the mu-neutrino, but for us it is important to deform precisely within the diameter of the mu-neutrino.

It is clear from the figure that the first will be to deform the simples of tau-neutrino, up to the moment when they "envelop" the mu-neutrino simples by about a quarter of their diameter (in the figure these areas are shaded), see Fig. 4_3 (c). For a larger number of nucleons or an asymmetric deformation of two nucleons, the region of coverage and deformation of the mu neutrino will be larger (see Figure 4_4)

In the regions of deformation simples of the mu-neutrino , the radius of their bending begins to decrease and become less than the critical radius of the bending of the simples. This will lead to cracking and tearing of individual mu-neutrinos. The remaining mu-neutrinos will turn slightly, taking advantage of the place freed from the bursting mu-neutrinos, and as a result they will retain their radius and remain intact.

This variant of bursting of mu-neutrinos can have several "modifications". Let's analyze them by assigning them the option numbers, beginning with the second one (the first variant is the decay of the relic proton into a proton and an electron).

The second option:

The mu-neutrino bursting relatively far from the "quark hoop", Fig. 4_4.

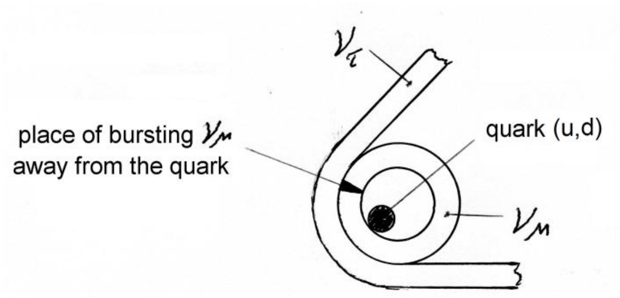


Fig. 4_4. The second version of bursting of mu-neutrino for nr_nucleosynthesis of isotopes

In this case, the mu-neutrino is scattered into two simples-spirales Sμ+ and Sμ -, the "standard" mechanisms of their shortening (gluons dropping) and annihilation are launched. The number of mu-neutrino bursts with this variant is calculated from one or more (say to N). For each bursting mu-neutrino, a certain number of gluons and one pair of electron ± antineutrinos and gamma quanta (νe + γ) are formed. In this case, the relic neutron is converted into a neutron. The S_formula of the second variant looks like this:

$N\nu_\mu \rightarrow N (S_\mu+ + S_\mu-) \rightarrow N (\nu_e + \gamma) + g_{SIF} + g_F$

or $n_r \rightarrow n + N (\nu_e + \gamma) + g_{SIF} + g_F$

The only "problem" with this option is the "procedure of pop-up" of the bursting mu-symbols from under the "hoop of quarks". It seems that the burst mu-simples have time to straighten out into an arc, to shorten from two sides (to reset the turns of the TEV), to "soften" (the internal magnetic vortex weakens), and after that the problem of "popping out" from under the "hoop of quarks" is solved "painlessly" without destruction "hoop of quarks".

Notes to the second option:

1. We remind you that the minimum value of N should be equal to one (in a relic neutron, at least 1 pcs of mu-neutrino is bursting), with one pair (ve + γ) formed from each mu-neutrino burst. In the general case, the number of pairs formed (ve + γ) is equal to the number of burst of mu-neutrinos (N).

2. When a new relic neutron is added, the compression forces act not only on it, but also on other nucleons of the nucleus (the number of flagellums of gluons_SIF grows). Therefore, mu-neutrinos can burst not only in the relic neutron, but also in other nucleon of nuclei, both in neutrons and in protons. For the "purity" of the second variant, we believe that there is no change in the species of nucleons in this case, i.e. neutrons remain neutrons, and protons are protons. The formula for the mu-neutrino bursting reaction in the second variant does not change in this case.

The maximum number of bursting mu-neutrinos in this version is 126 pieces. when the isotope 14O is formed from the 13O isotope. (It should be noted that when the isotope 4He is formed from the 3He isotope, only 112 mu neutrinos burst).

__The Third option:__

When the relic neutron is added, the mu neutrino bursts in it directly under the "quark hoop". In this case, a fragment of the "hoop of quarks" is falls into in the mu-neutrino gap formed. The fragment of the "hoop of quarks" is burned by a powerful magnetic vortex "pouring" out of the bursting simple-bagels of mu-neutrino, see Fig. 4_5.

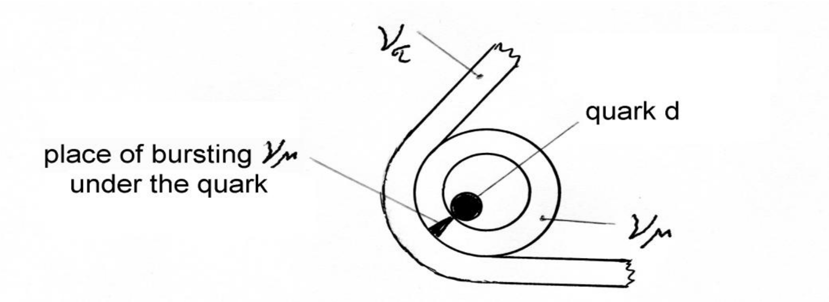


Fig. 4_5. The third version of mu-neutrino bursting for nr_ nucleosynthesis of isotopes (under the quark d)

With a 2: 3 probability, the fragment of the "hoop of quarks" bursts to be a quark d consisting of two simples Sd-. The power of the "micro explosion" in this version will be greater than in the second. As a result of this "micro explosion," at least five more mu-neutrinos should burst in order to form a new quark u (of 4 pcs of Su +) and an electron (from 6 pcs of Se-). The general S_formula of this process looks like this:

$6\nu_\mu + d = 6S_\mu- + 6S_\mu+ +2S_d- = 4S_u+ + 6S_e- + g_{SIF} + g_F +$ annihilation$(2S_\mu+ + 2S_d-) = u + e- + g_{SIF} + g_F + 2(\nu_e + \gamma)$

or $n_r \rightarrow p + e- + 2(\nu_e + \gamma) + g_{SIF} + g_F$

The relic neutron turns into a proton.

Notes:

__Note 1. The third variant, nr nucleosynthesis of new isotopes occurs with the transformation of the relic neutron into a proton__ (is formed new elements of Mendeleyev's table). The exception is the reaction of nr_ nucleosynthesis of the 1H isotope in the decay of the relict neutron in the first variant with the bursting of 8 pcs. mu-neutrinos. The difference between these options is that when the 1H isotope is formed, the process takes place without any external influences. The formation of all other isotopes with the transformation of the relic neutron into a proton in the third variant occurs under the influence of strong nucleon interaction forces, while a mu-neutrino bursts from 6 pcs. and more. We will use this minimal number of bursting mu-neutrinos (6 pcs) to verify the results of calculating the corresponding steps of nr_nucleosynthesis, at which the relic neutron turns into a proton.

Note 2. In general, the number of bursting mu neutrinos (N) in the third variant may be more than 6 pcs. In this case, the number of pairs formed (ve + γ) is equal to (N-4) pcs., i.e 1 pcs. The maximum number of mu-neutrinos in the third variant bursts in the third step of nr_nucleosynthesis when the 3He isotope is formed. In this case, 38 pcs mu-neutrino bursted. , and 34 pcs (ve + γ) are formed.

Note 3. "Mechanism" of confinement (at the level of the idea, hypothesis). In the first and third variants, the quark species is changed (confinement). In the first variant (d + d) → (d + u), in the third variant (d) → (u). Having carefully considered the question of what simples are formed, we see that the new quarks are formed from the simples of the bursting mu-neutrinos, and the simples of the old quarks "go" into annihilation.

This means that the new quarks "physically" are in no way connected with the old quarks. At the same time, there is clearly a "logical" connection between them - one new quark always has the opposite for to an old quark.

S_analysis of this question on the resulted S_formula of reaction (the third variant) "prompts" that in order to form a quark u, it is necessary that the process of electron formation and the process of annihilation of the 2Sd-block with two Sμ+ simples pass pass first. As a result, it remains just four positive simples-spirales Sμ +, which will shorten up long to four simples-spirales Su +, from which only the quark u can form.

True, in the second chapter, when analyzing the decay of the relic neutron, we rearranged the order of these processes (first formed the quark u, then the electron and then annihilated the remaining simples) - so it was easier for us to explain the result of the microexplosion in the decay of the relic neutron. Apologize for such a free treatment of the order of physical processes, let's analyze it in more detail.

Note 4. The order of processes in the "microexplosion."

Analysis is based on the example of the "microexplosion" (mu-neutrino bursting) in the minimal third variant (6 mu-neutrinos burst). In the "microexplosion" of the third variant, six processes occur: mu-neutrino bursting, burning out the old quark d from the quark hoop, shortening of formed the simples-spirales, creating a new quark u, forming an electron, annihilating the simples.

In what order do these processes occur?

Step 1.

Everything begins, of course, with the "bending" and tearing of one mu-neutrino under the quark d. The quark d, falls into the gap of bursted of the mu-neutrino and burned into two parts. The "microexplosion" has leads to a burning of at least another five mu-neutrinos.

Step 2.

Two parts (halves) of the quark d (we will assume that this is 2 pcs of Sd-), which have negative charges, are very quickly attracted to two positive Sμ+ simples-spirales and their annihilation occurs:

$2S_d- + 2S_\mu+ \rightarrow 2\ (\nu_e + \gamma)$

Step 3.

The second "microexplosion" from annihilation imparts an impulse to the remaining simples-spirales (6 pcs Sμ- and 4 pcs Sμ+). Their motion occurs in the internal magnetic field of the nucleon, formed by the azimuthal electric vortices of the tau-simples. Motion in a magnetic field of particles with different electric charges pushes them in different directions, as a result two groups of simples 6Sμ- and 4Sμ+ are formed.

Step 4.

The simples-spirales S- (6 pcs) were shortened to simples-spirales Se- (6 pcs), and bunted into arcs about 60 °, and their powerful magnetic fields (vortices) at the ends of the simples collect them in an electron bagel.

Step 5.

The simples-spirales Sμ+ (4 pcs) also were shortened and gathered in a single block, but their length is not enough to twisting into a bagel. The process of their shortening goes successively to the resonance length of simples-spirales Su+ (4 pcs) from which to twisting the quark u and it occupies a free space in the "quark hoop" , restoring its integrity (with the transformation of the relict neutron into a proton).

6-th step (possible formation of EPP).

Above we noted that when the number of burst mu-neutrinos is greater than 6 pcs. all the additional simples-spirales that are created must annihilate. However, it should be noted that with the number of burst mu-neutrinos 12, 18, 24, etc. conditions arise for the formation of additional electrons and positrons. In principle, they can to bumping into each other, breaking their bagels and to annihilating. But another option is possible. With a low kinetic energy of the "encounter" of an electron and a positron, annihilation is not possible, but is possible the formation of electron-positron pairs (EPP) by analogy with the formation of mu-neutrinos and tau-neutrinos from two bagels with opposite electric charges.

<u>Note 5. Let's try to estimate in what range the mu-neutrino should burst from the "quark hoop"</u> , so that the relic neutron turns into a proton and how it correlates with the ratio of protons and neutrons in the Universe. All approximately 3,000 isotopes are in the isotope range from 1H to 260Fm. In the 6th chapter, when simulating the process of nr_nucleosynthesis of an isotope cloud, we will select the so-called "Horizontal algorithm" of nr_nucleosynthesis of isotope cloud, in which 2,900 isotopes of the cloud were formed by the addition of a neutron, and 100 pieces. isotopes were formed by the addition of a proton, which is 100/3000 = 3.33%.

The probability that a quark d will appear at the site of the mu-neutrino burst is 2/3 = 66.67%. Correspondingly, the angular sector of the mu-neutrino torus near the "quark hoop" , the bursting within which will lead to the "pulling" of the quark d from the "quark hoop" and the transformation of the relic neutron into a proton, is 3.33 / 66.67 * 360° = 18°. Knowing the length of the mu-neutrino bagel (~ 27.35d), it is possible to calculate the length of the mu-neutrino segment, which will lead to the burning of the quark d and its replacement by the quark u. The length of this segment is $18^o / 360^o$ * 27.35 = 1.37d.

The result is quite realistic. It means that the mu-neutrino bursting only directly under the quark d leads to the formation of a proton, in all other cases neutrons will be formed.

If we carried out this calculation in reverse, i.e. at first they were set by the value of the segment of the mu neutrino under the quark d, the bursting in the interval of which would lead to the burning of the quark d, and the value of this segment would be chosen, say, equal to 1d (the diameter d of the quark), then we would obtain the ratio of protons and neutrons in the Universe equal to 100: 3900, which in the evaluation version is pretty close to "reality". In addition, as will be shown below, the reference cloud of isotopes is incomplete in width. The number of isotopes formed by the addition of neutrons is larger. True correct value lies somewhere in the designated range.

<u>The fourth option (exotic):</u>

If in a relic neutron the mu-neutrino bursts under the "quark hoop" in the quark region u (see Fig. 4-6), then the quark u will be burned and in its place (by confinement) quark d should form.

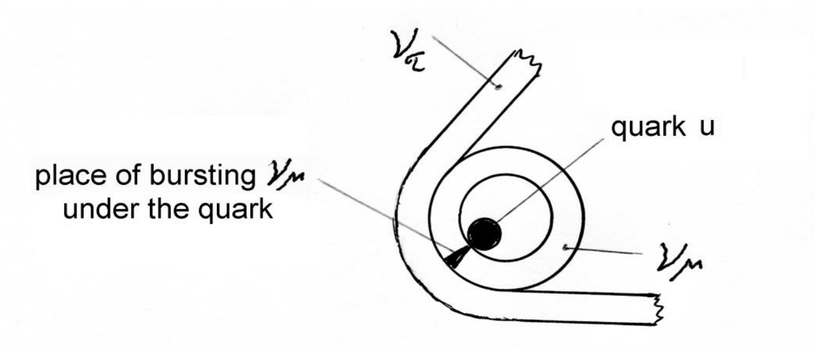


Fig. 4_6. The fourth version of the bursting of mu-neutrino
for nr_ nucleosynthesis of isotopes (under the quark u)

S_formula of this process will look like this:

$6ν_μ + u = 6S_μ- + 6S_μ+ + 4S_u+ = 2S_d- + 6S_e+ +$ annihilation $(4S_μ- + 4S_u+) = d + e+ + 2 (ve + γ) + Mg$,

where $Mg = g_{SIF} + g_F$

As a result, a nucleon was obtained, the "quark hoop" of which consists of three quarks d, its charge is minus one (-1) - a kind of antiproton (!). In addition, a positively charged positron was formed and flew outside.

But a nucleon with three quarks d can not exist (we discussed this question in the formation of a relic neutron), the quarks d are shorter and as a result too large gaps between quarks are formed. Therefore, no "antimatter" is formed.

In the newly formed "non-standard" nucleon (d + d + d), there will immediately the falling through a mu-neutrino into the gap between two quarks d, an additional 8 pcs mu-neutrino bursted (similarly to the first variant), the formation of a pair of quarks (d + u) and a negatively charged electron. The "quark hoop" becomes (d + d + u), the "non-standard" nucleon (d + d + d) again turns into a neutron:

$8ν_μ + 2d = 8S_μ- + 8S_μ+ + 2*2S_d- = 2S_d- + 4S_u+ + 6S_e- +$ annihilation$(4S_μ+ + 2*2S_d-) = d+u + e- + 2(ν_e+γ) + Mg$

The formed positron (in the first stage) and the electron (in the second stage) annihilate (breaking their bagels in a collision), or form electron-positron pair (EPP), or they go "to plow" the expanses of the Universe by themselves.

The two reduced S-formulas can be combined into one equation:

nr → n + (e+ + e-) + 4 (ve + γ) + Mg

In general, this option of nr_nucleosynthesis by analogy with double β-decay can be called double nr_nucleosynthesis.

Totally in this option, a minimum of 14 mu-neutrinos are bursted and at least four pairs (ve + γ) are formed. The maximum values of the bursting mu-neutrinos are no more than in the second version.

The relict neutron as a result becomes a "simple" neutron.

Note:

In this option, we "met" a new kind of nucleon consisting of three quarks d. Such nucleons in the real world (matter) do not exist, they immediately disintegrate (i.e. are virtual). But, strictly speaking, they can exist for a while. Purely dialectically, they can be considered a confirmation of Sakata Soyiti's hypothesis of the existence of three nucleons (sacatonons), although the parameters of our third nucleon are completely different from those of the third saccaton.

And although physics has long since abandoned this hypothesis, the possibility of the existence of additional "quarks" or new "nucleons" emerges in S_theory not the first time - let us recall our calculations and the selection of acceptable quarks for the formation of a relict neutron. At that time before us also "surfaced" additional "quarks", but we were able to "reject" them (to exclude from the process of formation of the relic neutron) and "send to manifest themselves" in Dark matter. What "quarks", what "nucleons" and what particles are "waiting" for us in the Dark Matter, we do not yet know (now we are considering the model of substance formation). Although S_theory, in principle, makes it possible to conduct a combinatorial analysis of possible variants of formation of "particles" matter, by sorting out of the set of simples already known to us. In the 12th chapter we will calculate the number of simples of each kind spent on the formation of matter and those who have departed into the Dark Matter.

The final scheme (variants) of bursting of mu-neutrino at nr_nucleosynthesis

Of the four disassembled options bursting of mu-neutrino at the reactions of nr_nucleosynthesis, we leave the first three options for calculating the number of bursted mu neutrinos:

The first option - the burst 8 pcs. mu-neutrinos and two quarks (d + d) are destroyed. The relic neutron decays into a proton and an electron, which combine to form the isotope 1H. The number of pairs formed (ve + γ) is always two.

The second option - mu-neutrinos bursted from 1 pc. up to 126 pcs. "far" from the "hoop of quarks". The "quark hoop" remains intact (without changing the quark composition). The relic neutron turns into an "ordinary" neutron. An isotope of this element is formed according to the Mendeleyev table. The number of pairs formed (ve + γ) is equal to the number of burst mu-neutrinos.

The third option - the burst from 6 pcs. up to 38 pcs. mu-neutrino under the quark d. The relic neutron decays into a proton and an electron, an isotope of the next element of the periodic table is formed. The number of pairs formed (ve + γ) is (N-4) , where N is the number of burst mu-neutrinos.

These three options can completely close all the steps of nr_nucleosynthesis, so we will not consider the fourth variant (exotic) when calculating the number of the bursting and remaining mu-neutrinos in reactions of nr_nucleosynthesis. If it was present in real reactions of nr_nucleosynthesis, then formally in the our calculation it is replaced by the second variant.

Step-by-step calculation of the reactions nr_nucleosynthesis of the spectrum of isotopes

To carry out this calculation, we need an isotope table.

As a baseline, we take the isotope table from the source [12]. The initial part of this table (see Table 3) is given below with the calculation of the mass defect of isotopes relative to the weight of the relic neutron that is added and the recalculation of this mass defect into the number of burst mu-neutrinos.

Table 3

Isotopes	*Qty. nuk-lones*	*Qty. p*	*Qty. n*	*isotope mass (aum)*	*Mass of the core isotope without electrons (MeV)*	*Growth masses core (MeV)*	*Defect masses core (MeV)*	*Defect masses in mu-neutrino (pcs)*
H	*1*	*1*	*0*	*1,0078250321*	*938,272013*	*938.272033*	*-1.858273*	*-10*
D	*2*	*1*	*1*	*2,0141017778*	*1875,612845*	*937.340812*	*-2.789494*	*-15*
T	*3*	*1*	*2*	*3,0160492777*	*2808,920991*	*933.308145*	*-6.822161*	*-36*
3He	*3*	*2*	*1*	*3,0160293191*	*2808,391401*	*932.778555*	*-7.359191*	*-39*
4He	*4*	*2*	*2*	*4,0026032541*	*3727,379162*	*918.458171*	*-21.679576*	*-116*

We have given only the initial part of the isotope table, because when analyzing the number of mu-neutrinos that have burst, we very quickly encounter in our path the uncertainty associated with parallel processes when nr_nucleosynthesis of the spectrum of isotope nuclei.

In fact, upon the addition of a relic neutron to the nucleus of deuterium, the nucleus of tritium can form (the relic neutron remained a neutron) or the nucleus of the 3He isotope can form (the relic neutron turned into a proton). Probably, such ambiguity is connected with different conditions of the collision of the relic neutron with the deuterium core (and maybe even with which nucleon of deuterium contains proton and a neutron, and that a new relic neutron may flying from the side of different nucleons).

Further, respectively, the core of the 4He isotope can be formed either from the tritium (3H)nucleus or from the nucleus of the 3He isotope.

There are two parallel "paths" for the formation of 4He, and we have considered only combinations of their two isotopes of one element and two isotopes of another element. But the variety of isotopes of elements in the summary table of isotopes reaches 20-30 pieces. (and according to other sources, even more).

If we depict all the isotopes not as a table, but graphically as a Z-N diagram, we obtain a "cloud" of isotopes (Fig. 4_7), which is often given in various sources.

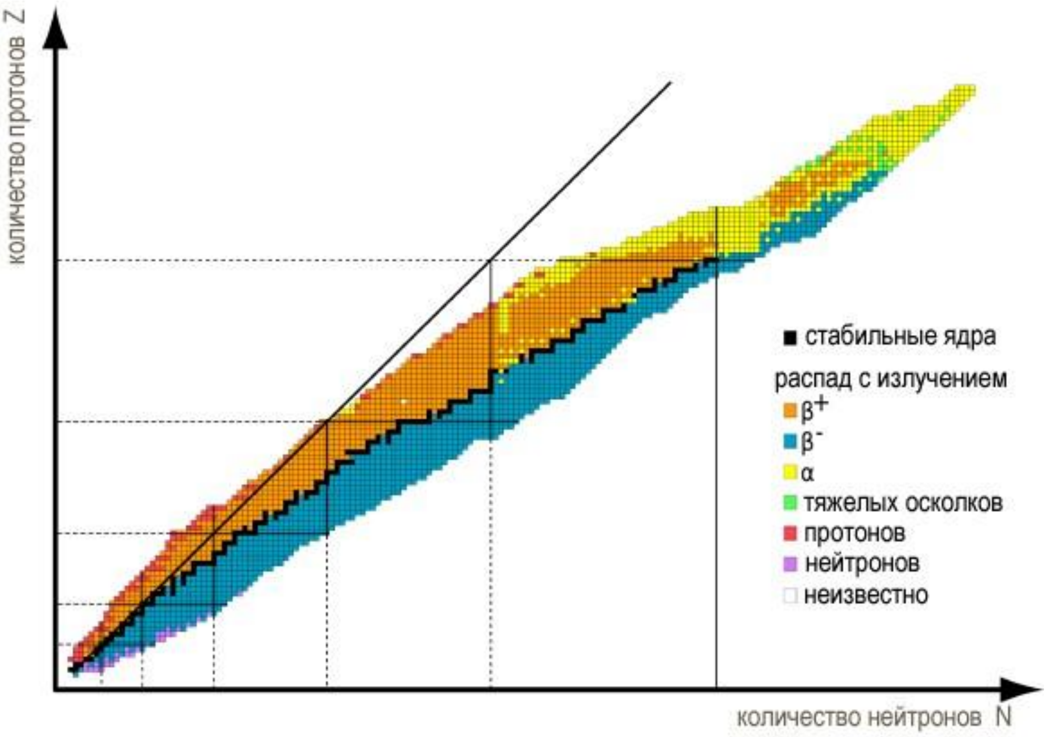


Fig. 4_7. Cloud of isotopes

One can easily imagine that there are a huge number of ways to go through the reactions of nr_ nucleosynthesis of isotope nuclei in this "cloud". It is simply not possible to analyze all possible ways at the same time.

Therefore, we simplify the conditions of the problem:

1) From the whole variety of ways of reactions of primary nr_nucleosynthesis in the isotope cloud, we select the "main stream", leaving on it those isotopes that are stable or have a maximum half-life.

2) We restrict the isotope table to the element fermion with the 100th number according to the periodic table containing 256 nucleons (256Fm).

As a result, we obtain a number of 256 stable isotopes, isolated in Fig. 4_7 in black. We named this row of isotopes main stream, each isotope of this row contains by one nucleon more, and in this row it is possible to calculate unambiguously the dynamics of all isotope components at each step of nr_nucleosynthesis.

Next, we will write down the algorithm for this calculation. The results of the calculation are presented in the form of a table.

<u>Input for calculation:</u>

1) Reference mass of isotopes see [12]:

2) Relict neutron nr = $60\nu\tau_{(ST)} + 61\nu\mu_{(ST)} + (u_{ST} + 2d_{ST})$ = 939.75120755 (MeV)

3) Mass simples: $\nu\tau_{(ST)}$ = 15.4662563; $\nu\mu_{(ST)}$ = 0.18582935; u_{ST} = 0.1517065; d_{ST} = 0.14262625 (MeV)

4) $p_{(REC)}$ = 938.272013; $n_{(REC)}$ = 939.5653782; $e^-_{(REC)}$ = 0.51099891 (MeV)

5) ν_e = 20 (eV)

<u>Algorithm of calculation:</u>

Let us write down the scheme of the nr_nucleosynthesis reaction proposed above in the form of the formula:

$m_1 + n_r \rightarrow m_2 + Y$ (1)

Here: m_1 is the mass of the initial isotope,

m_2 is the mass of the resulting isotope,

Y is the mass of the departed particles.

We will open the masses of isotopes:

$(N_1 + e\text{-}_1 + VP_1) + n_r \rightarrow (N_2 + e\text{-}_2 + VP_2) + Y$ (2)

Here:

N_1 is the mass of the nucleus of the initial isotope,

N_2 is the mass of the nucleus of the resulting isotope,

$e\text{-}_1$ is the mass of all the electrons of the initial isotope,

$e\text{-}_2$ is the mass of all the electrons of the resulting isotope,

VF_1 is the mass (energy) of all flagellums of the VP of the initial isotope,

VF_2 is the mass (energy) of all flagellums of the VP of the resulting isotope.

Remember, dear readers, that in accordance with the postulate No. 3 ST, all particles with closed magnetic vortices have a mass (stored internal energy), including gluons, and virtual photons, as well as the flagellums formed by them to transmit electromagnetic interaction. This means that the mass (energy) of the coupled virtual photons and gluons (flagella VP and flagellum gluons_SIF) in theoretical calculations can not be neglected. As values of the VP flagellum masses (energies), we use the ionization energy of the corresponding isotope (electron detachment energy). The mass (energy) of the flagellum gluten-SIF in our algorithm is the calculated value. In the formula, it "sits" in the mass of the nuclei.

In the above formula, an arrow is used instead of the equal sign, this is not an accident, because Virtual photons for building flagellums are taken "from the outside" (from space), and when ionization (destruction of the flagellum) "fly away" again into space. In other words, they do not participate in the balance of masses (energies) for all nuclear reactions. With this in mind, the formula (1) presented above can be written in the form of the following equation:

$(m_1 - VP_1) + n_r = (m_2 - VF_2) + Y$, hence

$Y = (m_1 - VP_1) + n_r - (m_2 - VF_2)$ (3)

All the data on the right-hand side of the equation is known to us, which means that we can calculate the mass (energy) of the particles that have flown from the isotope.

Similarly to formula (2), we reduce the equation to the equation, revealing the composition of the mass of the nuclei and discarding the indices "ST" (all calculations are carried out for ST):

$(A * 60\nu_\tau + X\nu_\mu + q_1 + g_{1\,(SIF)} + e\text{-}_1 + VP_1) - VP_1 + 60\nu_\tau + 61\nu_\mu + (u + 2d) =$

$= ((A + 1) * 60\nu_\tau + (X + 61\text{-}N)\ \nu_\mu + q_2 + g_{2(SIF)} + e\text{-}_2 + VP_2) - VP_2 + Y$ (4)

Here: A is the number of nucleons in the initial isotope,

X is the number of all mu-neutrinos in the initial isotope,

N is the number of burst mu-neutrinos at this stage of nr_nucleosynthesis,

q_1 and q_2 are the masses of all quarks in isotopes,

$g_{1\,(SIF)}$ and $g_{2\,(SIF)}$ - the mass (energy) of all gluons_SIF in isotopes.

It should be noted that $e\text{-}_2$ differs from $e\text{-}_1$ by one electron (Δe- = e-) when a relic neutron transforms into a proton (the first and third variants of mu neutrino bursting), and $e\text{-}_2 = e\text{-}_1$ (Δ e- = 0) during the transformation of the relic neutron into a neutron (the second version of mu neutrino bursting). In the general form, $e\text{-}_2 = e\text{-}_1 + \Delta e\text{-}$.

More complicated with quarks, the general formula for transforming quarks is as follows:

$q_2 = q_1 + (u + 2d) - q_{bursted} + q_{formed}$

$q_{bursted}$ = 2d at the formation of the isotope 1H

= d at the formation of other isotopes with the transformation of n_r into p

= 0 at the formation of other isotopes with the transformation of n_r into n

q_{formed} = u + d at the formation of the isotope 1H

= u at the formation of other isotopes with the transformation of n_r into p

= 0 at the formation of other isotopes with the transformation of n_r into n

We obtain:

$q_2 = q_1 + \Delta q$, where

$\Delta q = u + d$ at the formation of isotopes with the conversion of nr to p (including 1H)

= 0 at the formation of other isotopes with the transformation of nr into n

Let us now turn to the calculation of the number of burst mu-neutrinos (N) and the mass (energy) of the formed gluons_SIF (g_{SIF}).

By analogy with electrons and quarks, we can write as follows:

$g_{2\,(SIF)} = g_{1\,(SIF)} + \Delta g_{SIF}$,

Here: Δg_{SIF} is the mass (energy) of the formed gluons_SIF.

Substituting these expressions into equation (4), we get:

$N\nu_\mu = Y + \Delta q + \Delta g_{SSB} + \Delta e-$ (5)

From here:

$N = (Y + \Delta q + \Delta g_{SSB} + \Delta e-) / \nu_\mu$ (6)

In the obtained equation, with respect to a certain step of nr_nucleosynthesis, there are two unknown terms - N and ΔGCCB. We need to somehow decide with Δg_{CCB} to calculate N.

In SM, gluons are considered massless particles, although in the form of a total cloud of gluons they constitute the bulk of nucleons and atomic nuclei.

In ST, the "picture" is different. The bulk of the nucleons (atoms) are tau-neutrinos, and not gluons. The second largest mass is represented by the mu-neutrino, being the main variable (consumable) mass of nucleons (atoms) for various nuclear reactions. In addition, there are still quarks and electrons in the isotope. The remaining mass is accounted for by gluons.

We know that all the components in the numerator of equation (6) are formed from the simples of the bursting mu-neutrinos. At the same time, only a whole number of mu-neutrinos (N) can burst. If we assume that $\Delta g_{SIF} < \nu\mu$, then we can "discard" the mass Δg_{SIF} and calculate the fractional number N, and then round it up to an integer up. The difference between the mass of the obtained integer and the fractional number of the mu-neutrino will represent the mass (energy) of the formed gluons_SIF (Δg_{SIF}).

Let's try to estimate the value of the mass (energy) of the formed gluons_SIF (Δg_{SIF}) and compare it to the mass of the mu-neutrino.

We begin with the 1H isotope and calculate its mass, taking into account the mass of the flagellumsr VP (ionization energy):

$1H^* = p + e- + VP_H = 938.78302551$ (MeV)

Let us compare the mass obtained with the reference mass of the isotope $1H_{ref}$:

$\Delta = 1H_{ref} - 1H^* = 0.00000639$ (MeV), which is much less than ν_μ

What is this delta of the masses? In order not to introduce any new particles and components into the model of isotopes, in ST this mass is identified with the gluons_SIF ($\Delta = \Delta g_{SIF}$ (1H)) formed during the decay of the relic neutron. These gluons_SIF formed flagellums, and filled the formed 8 pcs holes in the place of bursting 8 mu-neutrinos. At the level of a single nucleus of the isotope 1H, consisting of a single nucleon, these gluons_SIF flagellum do not perform the function of SIF, but "hang out" along the edges of a standard proton as a kind of "hair" until a relic neutron or other nucleon appears in their "field of activity" . Here they instantly "cling" to the flagellums of the gluons. Their slit magnets begin to perform the functions of the SIF, pulling the nucleons along the axis of the nucleus of the atom.

It should be noted that the flagellum of gluons_SIF even in such a "free" state of the "hair" contribute to the total mass of the isotope 1H. The size of this contribution is:

Δ / 1Hc = 0.00000639 / 938.783031900339 = 6.8E-11%.

A similar calculation for the isotope of deuterium (2H) is somewhat more complicated, since we know the mass of only one nucleon, the reference neutron: n_{ref} = 939.5653782 (MeV). We do not yet know the mass of the proton in deuterium, because in it, in comparison with the reference proton (p_{ref} in the 1H isotope), when the nucleons are pull together into the deuterium nucleus, several mu-neutrinos have additionally bursted.

To solve this dilemma, we make the assumption that in all nuclear reactions, the increase in the mass (energy) of the gluons_SIF is always less than the mass of one mu-neutrino.

The correctness of this assumption will be further confirmed by the results of our calculation, namely the overall balance of the expenditure of the mu-neutrino in the process of nr_nucleosynthesis, which exactly matches the range from 61 pcs. mu-neutrinos in a relic neutron up to 9 pcs. mu-neutrinos per each nucleon in the 56Fe isotope.

Taking into account the decision taken, the fractional and whole number of burst mu-neutrinos will be calculated by the following formulas:

$N_{fraction} = (Y + \Delta q + \Delta e\text{-}) / \nu_\mu$ (7)

$N_{integer} = \text{INTEGER}(N_{fraction}) + 1$ (8)

Formula (7) can be expanded by substituting for it the expression (3) for calculating Y:

$N = ((m_1 - VP_1) + n_r - (m_2 - VF_2) + \Delta q + \Delta e\text{-}) / \nu_\mu = ((m_1 - m_2) + nr + \Delta VF + \Delta q + \Delta e\text{-}) / \nu_\mu$ (9)

Here: $\Delta VF = VP_2 - VP_1$

Then the mass (energy) of the formed gluons_SIF (Δg_{SIF}) will be:

$\Delta g_{SIF} = (N_{fraction} - N_{integer}) * \nu_\mu$ (10)

Remark:

Many readers will probably doubt such a pejorative decrease in the mass of gluons in S_theory and a hypertrophic increase in the role of the mass of tau- and mu-neutrinos (especially tau-). Let's try to give a physical explanation to these "facts".

Concerning the fraction of gluons. We somehow have no doubt that the electromagnetic confinement of electrons in orbit around the atomic nuclei is carried out by photons whose mass is negligible. Why, then, is the electromagnetic attraction and compression of nucleons in nuclei through flagellum of gluons_SIF (as S_theory claims) to be effected through a much more "massive working body" - gluons? If in the SM the fraction of gluons is about 90% of the mass of nucleons and nuclei, then in the ST, only 0.0003% (2H) - 0.004% (4He) - 0.009% (56Fe) - 0.008% (260Fm) of mass isotopes. For comparison, the VP ratio in ST is about 0.000001% (2H, 4He, 56Fe) - 0.0000003% (260Fm) of isotope mass, which is less than the fraction of gluons in their nuclei in about 10^2 (2H) - 10^3 (4He) - 10^4 (56Fe - 260Fm) times. The resulting mass (energy) ratio of gluons_SIF and VP (on average 10^3: 1) correlates well with the known ratio of strong and electromagnetic forces, as ≈1: 10^{-3} [13].

All the numerical data of the mass (energy) of gluons_SIF given in this Remark are taken from the final table for calculating the reactions of nr_nucleosynthesis performed according to our algorithm.

About the mass of tau- and mu-neutrinos. If all nucleons (and atoms, respectively) consist mainly of tau- and mu-neutrinos, why do we not find them in mass quantities when "breaking" protons, neutrons, atoms on accelerators? A fair question! The answer to it consists of two parts:

A) When the nucleons are "forced" to break down the "heavy hammer", the tau- and the mu-neutrino burst, turn into simples-spirales, which immediately begin to shorten, annihilate, merge into blocks, and so on. - as a result, a mass of gluons, electron-antineutrinos and gamma quanta is formed, as well as various unstable (virtual) particles, which in turn decay, and this continues until the process "calms down."

B) If the nucleon is "scattered" in some "good" way, so that only the "quark hoop" thread "completely collapsed" (all three quarks burst), and the tau- and mu-neutrino bagels remained intact (which with some the probability fraction can actually be), then the question arises of registering these neutrinos, which in itself, as is known, is not an entirely trivial task. It is necessary to increase the detecting ability of accelerators for registering tau- and mu-neutrinos.

We have not calculated the components of the Y-component (the mass that escaped from the isotope during the nr_nucleosynthesis reaction). These components include pairwise electron-antineutrinos and gamma quanta, as well as free gluons. Their total mass (Y) is known to us, see (3). Let's write down its real composition:

$$Y = (m_1 - VP_1) + n_r - (m_2 - VF_2) = P(\nu_e + \gamma) + g_F \quad (11)$$

Here:

P is the number of pairs of electron-antineutrinos and gamma quanta

g_F is the mass (energy) of "extra" (free) gluons that have flown out of the nucleus.

With the amount of P, we determined, analyzing the variants of mu-neutrino bursting with different types of reactions of nr_nucleosynthesis, it is equal to:

P = 2 when 1H isotopes are formed

P = N when other isotopes are formed with the transformation of n_r into n

P = (N-4) with the formation of other isotopes with the transformation of n_r into p

Knowledge of P gives us the opportunity to estimate the mass of all the formed electron-antineutrinos (ve), using the reference mass of one electron-antineutrino of the order of 20 eV. In the process of calculation, we will do this for each isotope.

At the end of the calculation, we will give an estimate of the mass of gamma quanta and free gluons, and at the end of the calculation, it will calculate the distribution (fraction) of the mass of all the busted simples at the newly formed components.

The results of the calculation of nr_nucleosynthesis were obtained by us in a tabular form for each isotope of main stream.

Considering the large volume of the obtained results of the calculation, we present them in the form of two tables 4 and 5.

In Table. 4 shows the results of calculation of the burst and remaining mu-neutrinos, as well as changes in other intra nuclear components of isotopes (quarks, gluons-SIF).

In Table. 5 shows the results of calculating the change in the extra nuclear components of isotopes (electrons, electron-antineutrinos, gamma quanta, free gluons). In Table. 5 also gives an estimate of the energy result of the reactions of nr_nucleosynthesis.

The purpose of our calculation is to analyze the change in the isotope components as a function of the number of nucleons in the isotope, as is customary in most studies.

We will not argue that the table of main stream isotopes adopted by us is flawless and reflects exactly the main way in which the process of primary nr_nucleosynthesis of the spectrum of isotope nuclei proceeded. This question requires a separate, more in-depth study and we will return to it below. To analyze the change in the parameters of stable isotopes from the number of nucleons in the isotope, this table suits us.

Table 4. Main stream of isotopes. Calculation of the burst and remaining mu-neutrinos, quarks and gluons_SIF for nr_nucleosynthesis.

Isotopes main stream	Stability -------- Half life	Mnemocode p_n	Isotope mass reference (MeV)	The isotope mass gain per step nr_nucleosynthesis (MeV)	Defect in the growth of the mass of the isotope nucleus with respect to nr = 939,75120755 taking into account e-, u-d, VP (MeV)	The mu neutrino collapsed per step nr_nucleosynthesis (pcs)	The mu-neutrino remains per step nr_nucleosynthesis (pcs)	The mu-neutrino remains to the isotope of all (pcs)	The mass of the broken quarks d per step nr_nucleosynthesis (MeV)	Mass of quarks formed per step nr_nucleosynthesis (MeV)	The mass of gluons_SIF remaining in the isotope per step of nr_nucleosynthesis (MeV)
2	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*
1H	стабилен (> 6,6×10(33) лет)	1_0	938,783032	938,783032	-1,486628	8	53	53	0,288533	0,295973	0,000006
2H	стабилен	1_1	1876,123844	937,340812	-2,410395	13	48	101	0,000000	0,000000	0,005386
3He	стабилен	2_1	2809,413399	933,289554	-6,980117	38	23	124	0,144266	0,151707	0,081398
4He	стабилен	2_2	3728,401160	918,987761	-20,763446	112	-51	73	0,000000	0,000000	0,049441
5He	700(30)·10−24 с	2_3	4667,966540	939,565379	-0,185829	1	60	133	0,000000	0,000000	0,000001
6Li	стабилен	3_3	5603,051160	935,084621	-5,185031	28	33	166	0,144266	0,151707	0,018191
7Li	стабилен	3_4	6535,369197	932,329526	-7,421682	40	21	187	0,000000	0,000000	0,011492
8Be	840,3(9) мс	4_4	7456,894157	921,513472	-18,756184	101	-40	147	0,144266	0,151707	0,012580
9Be	стабилен	4_5	8394,794196	937,900039	-1,851169	10	51	198	0,000000	0,000000	0,007125
10B	стабилен	5_5	9326,991349	932,197153	-8,072502	44	17	215	0,144266	0,151707	0,103989
11B	стабилен	5_6	10255,102596	928,111247	-11,639960	63	-2	213	0,000000	0,000000	0,067289
12C	стабилен	6_6	11177,928732	922,826136	-17,443522	94	-33	180	0,144266	0,151707	0,024437
13C	стабилен	6_7	12112,547804	934,619072	-5,132135	28	33	213	0,000000	0,000000	0,071087
14N	стабилен	7_7	13043,780271	931,232467	-9,037195	49	12	225	0,144266	0,151707	0,068444
15N	стабилен	7_8	13972,512353	928,732082	-11,019126	60	1	226	0,000000	0,000000	0,130635
16O	стабилен	8_8	14899,167974	926,655621	-13,614039	74	-13	213	0,144266	0,151707	0,137333
17O	стабилен	8_9	15834,590221	935,422246	-4,328961	24	37	250	0,000000	0,000000	0,130943
18O	стабилен	8_10	16766,111574	931,521354	-8,229854	45	16	266	0,000000	0,000000	0,132467
19F	стабилен	9_10	17696,899768	930,788193	-9,481471	52	9	275	0,144266	0,151707	0,181656
20Ne	стабилен	10_10	18622,839288	925,939520	-14,330148	78	-17	258	0,144266	0,151707	0,164541
21Ne	стабилен	10_11	19555,643500	932,804212	-6,946996	38	23	281	0,000000	0,000000	0,114519
22Ne	стабилен	10_12	20484,844627	929,201127	-10,550081	57	4	285	0,000000	0,000000	0,042192
23Na	стабилен	11_12	21414,833549	929,988922	-10,280730	56	5	290	0,144266	0,151707	0,125714
24Mg	стабилен	12_12	22341,923896	927,090347	-13,179307	71	-10	280	0,144266	0,151707	0,014577
25Mg	стабилен	12_13	23274,158700	932,234804	-7,516404	41	20	300	0,000000	0,000000	0,102600
26Mg	стабилен	12_14	24202,631003	928,472303	-11,278905	61	0	300	0,000000	0,000000	0,056685
27Al	стабилен	13_14	25133,142990	930,511988	-9,757665	53	8	308	0,144266	0,151707	0,091291
28Si	стабилен	14_14	26060,340910	927,197920	-13,071735	71	-10	298	0,144266	0,151707	0,122149
29Si	стабилен	14_15	26991,432722	931,091812	-8,659396	47	14	312	0,000000	0,000000	0,074583
30Si	стабилен	14_16	27920,388899	928,956177	-10,795030	59	2	314	0,000000	0,000000	0,168902
31P	стабилен	15_16	28851,875005	931,486106	-8,783551	48	13	327	0,144266	0,151707	0,136258
32S	стабилен	16_16	29781,794254	929,919249	-10,350408	56	5	332	0,144266	0,151707	0,056036
33S	стабилен	16_17	30712,718017	930,923763	-8,827444	48	13	345	0,000000	0,000000	0,092364
34S	стабилен	16_18	31640,866282	928,148265	-11,602943	63	-2	343	0,000000	0,000000	0,104306
35Cl	стабилен	17_18	32573,278591	932,412309	-7,857350	43	18	361	0,144266	0,151707	0,133312
36Cl	301 тыс. лет	17_19	33504,264336	930,985745	-8,765463	48	13	374	0,000000	0,000000	0,154346
37Cl	стабилен	17_20	34433,518722	929,254386	-10,496822	57	4	378	0,000000	0,000000	0,095451
38Ar	стабилен	18_20	35362,059770	928,541048	-11,728615	64	-3	375	0,144266	0,151707	0,164464
39K	стабилен	19_20	36294,461367	932,401597	-7,868054	43	18	393	0,144266	0,151707	0,122608
40K	1,248·10(9) лет	19_21	37226,227238	931,765871	-7,985337	43	18	411	0,000000	0,000000	0,005325
41K	стабилен	19_22	38155,697423	929,470185	-10,281022	56	5	416	0,000000	0,000000	0,125421
42Ca	стабилен	20_22	39084,203484	928,506061	-11,763592	64	-3	413	0,144266	0,151707	0,129487
43Ca	стабилен	20_23	40015,835956	931,632472	-8,118736	44	17	430	0,000000	0,000000	0,057756
44Ca	стабилен	20_24	40944,270245	928,434289	-11,316918	61	0	430	0,000000	0,000000	0,018672
45Sc	стабилен	21_24	41876,164942	931,894697	-8,374957	46	15	445	0,144266	0,151707	0,173193
46Ti	стабилен	22_24	42804,603423	928,438481	-11,831172	64	-3	442	0,144266	0,151707	0,061906
47Ti	стабилен	22_25	43735,288481	930,685058	-9,066149	49	12	454	0,000000	0,000000	0,039489
48Ti	стабилен	22_26	44663,227216	927,938734	-11,812473	64	-3	451	0,000000	0,000000	0,080605
49Ti	стабилен	22_27	45594,650204	931,422988	-8,328220	45	16	467	0,000000	0,000000	0,034101
50Ti	стабилен	22_28	46523,276381	928,626177	-11,125030	60	1	468	0,000000	0,000000	0,024731
51V	стабилен	23_28	47453,995718	930,719337	-9,550316	52	9	477	0,144266	0,151707	0,112810
52Cr	стабилен	24_28	48382,274262	928,278544	-11,991110	65	-4	473	0,144266	0,151707	0,087798
53Cr	стабилен	24_29	49313,900502	931,626240	-8,124968	44	17	490	0,000000	0,000000	0,051524
54Cr	стабилен	24_30	50243,746750	929,846248	-9,904960	54	7	497	0,000000	0,000000	0,129825

Isotopes main stream	Stability -------- Half life	Mnemocode p_n	Isotope mass reference (MeV)	The isotope mass gain per step nr_nucleosynthesis (MeV)	Defect in the growth of the mass of the isotope nucleus with respect to nr = 939,75120755 taking into account e-, u-d, VP (MeV)	The mu neutrino collapsed per step nr_nucleosynthesis (pcs)	The mu-neutrino remains per step nr_nucleosynthesis (pcs)	The mu-neutrino remains to the isotope of all (pcs)	The mass of the broken quarks d per step nr_nucleosynthesis (MeV)	Mass of quarks formed per step nr_nucleosynthesis (MeV)	The mass of gluons_SIF remaining in the isotope per step of nr_nucleosynthesis (MeV)
2	3	4	5	6	7	8	9	10	11	12	13
55Mn	стабилен	25_30	51174,462734	930,715984	-9,553670	52	9	506	0,144266	0,151707	0,109456
56Fe	стабилен	26_30	52103,062084	928,599350	-11,670305	63	-2	504	0,144266	0,151707	0,036945
57Fe	стабилен	26_31	53034,981372	931,919288	-7,831920	43	18	522	0,000000	0,000000	0,158743
58Fe	стабилен	26_32	53964,502156	929,520784	-10,230424	56	5	527	0,000000	0,000000	0,176020
59Co	стабилен	27_32	54895,921138	931,418983	-8,850672	48	13	540	0,144266	0,151707	0,069137
60Ni	стабилен	28_32	55825,171603	929,250464	-11,019190	60	1	541	0,144266	0,151707	0,130571
61Ni	стабилен	28_33	56756,916794	931,745192	-8,006016	44	17	558	0,000000	0,000000	0,170476
62Ni	стабилен	28_34	57685,885668	928,968874	-10,782334	59	2	560	0,000000	0,000000	0,181598
63Cu	стабилен	29_34	58618,546332	932,660664	-7,608990	41	20	580	0,144266	0,151707	0,010013
64Zn	стабилен	30_34	59549,616284	931,069952	-9,199704	50	11	591	0,144266	0,151707	0,091763
65Zn	243,66 сут	30_35	60481,202377	931,586093	-8,165115	44	17	608	0,000000	0,000000	0,011376
66Zn	стабилен	30_36	61409,708577	928,506201	-11,245007	61	0	608	0,000000	0,000000	0,090583
67Zn	стабилен	30_37	62342,221600	932,513022	-7,238185	39	22	630	0,000000	0,000000	0,009159
68Zn	стабилен	30_38	63271,588967	929,367367	-10,383841	56	5	635	0,000000	0,000000	0,022603
69Ga	стабилен	31_38	64203,762459	932,173493	-8,096160	44	17	652	0,144266	0,151707	0,080331
70Ge	стабилен	32_38	65134,021173	930,258714	-10,010941	54	7	659	0,144266	0,151707	0,023844
71Ge	11,43 сут	32_39	66066,170633	932,149460	-7,601747	41	20	679	0,000000	0,000000	0,017256
72Ge	стабилен	32_40	66994,986462	928,815829	-10,935378	59	2	681	0,000000	0,000000	0,028553
73Ge	стабилен	32_41	67927,768873	932,782410	-6,968797	38	23	704	0,000000	0,000000	0,092718
74Ge	стабилен	32_42	68857,138103	929,369230	-10,381978	56	5	709	0,000000	0,000000	0,024466
75As	стабилен	33_42	69789,022180	931,884078	-8,385579	46	15	724	0,144266	0,151707	0,162571
76Se	стабилен	34_42	70718,296584	929,274404	-10,995253	60	1	725	0,144266	0,151707	0,154508
77Se	стабилен	34_43	71650,443064	932,146479	-7,604728	41	20	745	0,000000	0,000000	0,014275
78Se	стабилен	34_44	72579,510676	929,067612	-10,683595	58	3	748	0,000000	0,000000	0,094507
79Br	стабилен	35_44	73511,962313	932,451637	-7,818022	43	18	766	0,144266	0,151707	0,172640
80Kr	стабилен	36_44	74441,632415	929,670102	-10,599558	58	3	769	0,144266	0,151707	0,178544
81Kr	2,29(11)·10(5) лет	36_45	75373,324884	931,692469	-8,058738	44	17	786	0,000000	0,000000	0,117753
82Kr	стабилен	36_46	76301,923489	928,598605	-11,152603	61	0	786	0,000000	0,000000	0,182988
83Kr	стабилен	36_47	77234,025257	932,101768	-7,649440	42	19	805	0,000000	0,000000	0,155393
84Kr	стабилен	36_48	78163,070420	929,045163	-10,706044	58	3	808	0,000000	0,000000	0,072058
85Rb	стабилен	37_48	79094,827850	931,757430	-8,512221	46	15	823	0,144266	0,151707	0,035929
86Sr	стабилен	38_48	80023,965661	929,137811	-11,131841	60	1	824	0,144266	0,151707	0,017920
87Sr	стабилен	38_49	80955,102867	931,137206	-8,614002	47	14	838	0,000000	0,000000	0,119978
88Sr	стабилен	38_50	81883,555600	928,452733	-11,298475	61	0	838	0,000000	0,000000	0,037116
89Y	стабилен	39_50	82815,269680	931,714080	-8,555573	47	14	852	0,144266	0,151707	0,178406
90Zr	стабилен	40_50	83745,698205	930,428525	-9,841129	53	8	860	0,144266	0,151707	0,007827
91Zr	стабилен	40_51	84678,069174	932,370970	-7,380238	40	21	881	0,000000	0,000000	0,052936
92Zr	стабилен	40_52	85608,999681	930,930507	-8,820700	48	13	894	0,000000	0,000000	0,099108
93Nb	стабилен	41_52	86541,739429	932,739748	-7,529906	41	20	914	0,144266	0,151707	0,089098
94Mo	стабилен	42_52	87472,032049	930,292620	-9,977034	54	7	921	0,144266	0,151707	0,057751
95Mo	стабилен	42_53	88404,228270	932,196221	-7,554986	41	20	941	0,000000	0,000000	0,064017
96Mo	стабилен	42_54	89334,639376	930,411106	-9,340102	51	10	951	0,000000	0,000000	0,137195
97Tc	2.6E+6 лет	43_54	90267,703471	933,064094	-7,205560	39	22	973	0,144266	0,151707	0,041785
98Ru	стабилен	44_54	91198,193381	930,489910	-9,779744	53	8	981	0,144266	0,151707	0,069212
99Ru	стабилен	44_55	92130,295056	932,101675	-7,649533	42	19	1000	0,000000	0,000000	0,155300
100Ru	стабилен	44_56	93060,187133	929,892078	-9,859130	54	7	1007	0,000000	0,000000	0,175655
101Ru	стабилен	44_57	93992,950448	932,763315	-6,987893	38	23	1030	0,000000	0,000000	0,073623
102Ru	стабилен	44_58	94923,296163	930,345715	-9,405492	51	10	1040	0,000000	0,000000	0,071804
103Rh	стабилен	45_58	95855,865820	932,569657	-7,699997	42	19	1059	0,144266	0,151707	0,104836
104Pd	стабилен	46_58	96785,992448	930,126628	-10,143027	55	6	1065	0,144266	0,151707	0,077587
105Pd	стабилен	46_59	97718,463646	932,471198	-7,280009	40	21	1086	0,000000	0,000000	0,153165
106Pd	стабилен	46_60	98648,468248	930,004602	-9,746606	53	8	1094	0,000000	0,000000	0,102350
107Pd	6,5 млн. лет	46_61	99581,496480	933,028232	-6,722976	37	24	1118	0,000000	0,000000	0,152710
108Pd	стабилен	46_62	100511,834557	930,338077	-9,413131	51	10	1128	0,000000	0,000000	0,064166
109Ag	стабилен	47_62	101444,129703	932,295146	-7,974508	43	18	1146	0,144266	0,151707	0,016154
110Cd	стабилен	48_62	102373,993742	929,864040	-10,405616	56	5	1151	0,144266	0,151707	0,000827
111Cd	стабилен	48_63	103306,583240	932,589498	-7,161710	39	22	1173	0,000000	0,000000	0,085635
112Cd	стабилен	48_64	104236,754300	930,171060	-9,580148	52	9	1182	0,000000	0,000000	0,082979

Isotopes main stream	Stability -------- Half life	Mnemocode p_n	Isotope mass reference (MeV)	The isotope mass gain per step nr_nucleosynthesis (MeV)	Defect in the growth of the mass of the isotope nucleus with respect to nr = 939,75120755 taking into account e-, u-d, VP (MeV)	The mu neutrino collapsed per step nr_nucleosynthesis (pcs)	The mu-neutrino remains per step nr_nucleosynthesis (pcs)	The mu-neutrino remains to the isotope of all (pcs)	The mass of the broken quarks d per step nr_nucleosynthesis (MeV)	Mass of quarks formed per step nr_nucleosynthesis (MeV)	The mass of gluons_SIF remaining in the isotope per step of nr_nucleosynthesis (MeV)
2	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*
113In	стабилен	49_64	105169,459490	932,705190	-7,564463	41	20	1202	0,144266	0,151707	0,054540
114Sn	стабилен	50_64	106099,762170	930,302680	-9,966974	54	7	1209	0,144266	0,151707	0,067811
115Sn	стабилен	50_65	107031,780662	932,018492	-7,732715	42	19	1228	0,000000	0,000000	0,072117
116Sn	стабилен	50_66	107961,783401	930,002739	-9,748469	53	8	1236	0,000000	0,000000	0,100487
117Sn	стабилен	50_67	108894,405501	932,622100	-7,129107	39	22	1258	0,000000	0,000000	0,118237
118Sn	стабилен	50_68	109824,642977	930,237476	-9,513732	52	9	1267	0,000000	0,000000	0,149394
119Sn	стабилен	50_69	110757,725235	933,082258	-6,668949	36	25	1292	0,000000	0,000000	0,020907
120Sn	стабилен	50_70	111688,182264	930,457029	-9,294179	51	10	1302	0,000000	0,000000	0,183118
121Sb	стабилен	51_70	112621,186277	933,004013	-7,265642	40	21	1323	0,144266	0,151707	0,167532
122Te	стабилен	52_70	113551,961411	930,775134	-9,494522	52	9	1332	0,144266	0,151707	0,168604
123Te	стабилен	52_71	114484,597577	932,636166	-7,115042	39	22	1354	0,000000	0,000000	0,132303
124Te	стабилен	52_72	115414,739015	930,141438	-9,609769	52	9	1363	0,000000	0,000000	0,053357
125Te	стабилен	52_73	116347,735390	932,996375	-6,754833	37	24	1387	0,000000	0,000000	0,120853
126Te	стабилен	52_74	117278,187109	930,451719	-9,299488	51	10	1397	0,000000	0,000000	0,177808
127I	стабилен	53_74	118210,762914	932,575805	-7,693852	42	19	1416	0,144266	0,151707	0,110981
128Xe	стабилен	54_74	119141,379787	930,616873	-9,652786	52	9	1425	0,144266	0,151707	0,010340
129Xe	стабилен	54_75	120074,036446	932,656659	-7,094549	39	22	1447	0,000000	0,000000	0,152796
130Xe	стабилен	54_76	121004,346205	930,309759	-9,441448	51	10	1457	0,000000	0,000000	0,035849
131Xe	стабилен	54_77	121937,306810	932,960605	-6,790602	37	24	1481	0,000000	0,000000	0,085084
132Xe	стабилен	54_78	122867,935606	930,628796	-9,122411	50	11	1492	0,000000	0,000000	0,169056
133Cs	стабилен	55_78	123800,639150	932,703544	-7,566107	41	20	1512	0,144266	0,151707	0,052896
134Ba	стабилен	56_78	124731,254316	930,615166	-9,654486	52	9	1521	0,144266	0,151707	0,008640
135Ba	стабилен	56_79	125663,847726	932,593410	-7,157797	39	22	1543	0,000000	0,000000	0,089547
136Ba	стабилен	56_80	126594,305314	930,457588	-9,293620	51	10	1553	0,000000	0,000000	0,183677
137Ba	стабилен	56_81	127526,965139	932,659826	-7,091382	39	22	1575	0,000000	0,000000	0,155963
138Ba	стабилен	56_82	128457,918748	930,953608	-8,797599	48	13	1588	0,000000	0,000000	0,122209
139La	стабилен	57_82	129390,443134	932,524387	-7,745266	42	19	1607	0,144266	0,151707	0,059567
140Ce	стабилен	58_82	130321,085251	930,642117	-9,627536	52	9	1616	0,144266	0,151707	0,035591
141Pr	стабилен	59_82	131254,641733	933,556482	-6,713170	37	24	1640	0,144266	0,151707	0,162516
142Nd	стабилен	60_82	132186,201464	931,559731	-8,709921	47	14	1654	0,144266	0,151707	0,024059
143Nd	стабилен	60_83	133119,643279	933,441815	-6,309392	34	27	1681	0,000000	0,000000	0,008805
144Nd	2,29·10(15) лет	60_84	134051,391638	931,748359	-8,002849	44	17	1698	0,000000	0,000000	0,173643
145Nd	стабилен	60_85	134985,201673	933,810035	-5,941173	32	29	1727	0,000000	0,000000	0,005366
146Nd	стабилен	60_86	135917,201814	932,000142	-7,751066	42	19	1746	0,000000	0,000000	0,053767
147Pm	2,6234 лет	61_86	136850,578984	933,377169	-6,892483	38	23	1769	0,144266	0,151707	0,169032
148Sm	7·10(15) лет	62_86	137781,778879	931,199895	-9,069757	49	12	1781	0,144266	0,151707	0,035881
149Sm	стабилен	62_87	138715,473129	933,694250	-6,056958	33	28	1809	0,000000	0,000000	0,075411
150Sm	стабилен	62_88	139647,051770	931,578641	-8,172567	44	17	1826	0,000000	0,000000	0,003925
151Sm	90 лет	62_89	140581,020717	933,968948	-5,782260	32	29	1855	0,000000	0,000000	0,164279
152Sm	стабилен	62_90	141512,328479	931,307762	-8,443445	46	15	1870	0,000000	0,000000	0,104705
153Eu	стабилен	63_90	142445,217825	932,889346	-7,380306	40	21	1891	0,144266	0,151707	0,052868
154Gd	стабилен	64_90	143376,372170	931,154345	-9,115308	50	11	1902	0,144266	0,151707	0,176160
155Gd	стабилен	64_91	144309,502308	933,130137	-6,621070	36	25	1927	0,000000	0,000000	0,068786
156Gd	стабилен	64_92	145240,531274	931,028966	-8,722242	47	14	1941	0,000000	0,000000	0,011738
157Gd	стабилен	64_93	146173,736862	933,205588	-6,545619	36	25	1966	0,000000	0,000000	0,144237
158Gd	стабилен	64_94	147105,364872	931,628010	-8,123198	44	17	1983	0,000000	0,000000	0,053294
159Tb	стабилен	65_94	148038,016687	932,651815	-7,617838	41	20	2003	0,144266	0,151707	0,001166
160Dy	стабилен	66_94	148969,371676	931,354989	-8,914664	48	13	2016	0,144266	0,151707	0,005145
161Dy	стабилен	66_95	149902,482717	933,111042	-6,640166	36	25	2041	0,000000	0,000000	0,049691
162Dy	стабилен	66_96	150833,851026	931,368309	-8,382898	46	15	2056	0,000000	0,000000	0,165252
163Dy	стабилен	66_97	151767,145479	933,294453	-6,456755	35	26	2082	0,000000	0,000000	0,047272
164Dy	стабилен	66_98	152699,052751	931,907272	-7,843936	43	18	2100	0,000000	0,000000	0,146726
165Ho	стабилен	67_98	153631,615515	932,562764	-7,706889	42	19	2119	0,144266	0,151707	0,097944
166Er	стабилен	68_98	154563,082563	931,467048	-8,802605	48	13	2132	0,144266	0,151707	0,117204
167Er	стабилен	68_99	155496,211489	933,128926	-6,622281	36	25	2157	0,000000	0,000000	0,067575
168Er	стабилен	68_100	156428,005491	931,794002	-7,957205	43	18	2175	0,000000	0,000000	0,033457
169Tm	стабилен	69_100	157361,216389	933,210898	-7,058755	38	23	2198	0,144266	0,151707	0,002760
170Yb	стабилен	70_100	158293,221374	932,004985	-8,264667	45	16	2214	0,144266	0,151707	0,097653

Isotopes main stream	Stability -------- Half life	Mnemocode p_n	Isotope mass reference (MeV)	The isotope mass gain per step nr_nucleosynthesis (MeV)	Defect in the growth of the mass of the isotope nucleus with respect to nr = 939,75120755 taking into account e-, u-d, VP (MeV)	The mu neutrino collapsed per step nr_nucleosynthesis (pcs)	The mu-neutrino remains per step nr_nucleosynthesis (pcs)	The mu-neutrino remains to the isotope of all (pcs)	The mass of the broken quarks d per step nr_nucleosynthesis (MeV)	Mass of quarks formed per step nr_nucleosynthesis (MeV)	The mass of gluons_SIF remaining in the isotope per step of nr_nucleosynthesis (MeV)
2	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*
171Yb	стабилен	70_101	159226,172292	932,950918	-6,800290	37	24	2238	0,000000	0,000000	0,075396
172Yb	стабилен	70_102	160157,718237	931,545945	-8,205262	45	16	2254	0,000000	0,000000	0,157058
173Yb	стабилен	70_103	161090,916280	933,198043	-6,553164	36	25	2279	0,000000	0,000000	0,136692
174Yb	стабилен	70_104	162023,017023	932,100743	-7,650464	42	19	2298	0,000000	0,000000	0,154368
175Lu	стабилен	71_104	162956,289958	933,272935	-6,996717	38	23	2321	0,144266	0,151707	0,064798
176Hf	стабилен	72_104	163888,377195	932,087236	-8,182418	45	16	2337	0,144266	0,151707	0,179903
177Hf	стабилен	72_105	164821,559216	933,182021	-6,569186	36	25	2362	0,000000	0,000000	0,120670
178Hf	стабилен	72_106	165753,498625	931,939408	-7,811799	43	18	2380	0,000000	0,000000	0,178863
179Hf	стабилен	72_107	166686,964938	933,466313	-6,284894	34	27	2407	0,000000	0,000000	0,033304
180Hf	стабилен	72_108	167619,142622	932,177684	-7,573523	41	20	2427	0,000000	0,000000	0,045480
181Ta	стабилен	73_108	168551,983438	932,840815	-7,428839	40	21	2448	0,144266	0,151707	0,004335
182W	стабилен	74_108	169483,671622	931,688184	-8,581470	47	14	2462	0,144266	0,151707	0,152509
183W	стабилен	74_109	170417,046183	933,374561	-6,376646	35	26	2488	0,000000	0,000000	0,127381
184W	стабилен	74_110	171349,199928	932,153745	-7,597462	41	20	2508	0,000000	0,000000	0,021541
185Re	стабилен	75_110	172282,579147	933,379219	-6,890436	38	23	2531	0,144266	0,151707	0,171079
186Os	2,0·10(15) лет	76_110	173214,895903	932,316757	-7,952899	43	18	2549	0,144266	0,151707	0,037763
187Os	стабилен	76_111	174148,171261	933,275357	-6,475850	35	26	2575	0,000000	0,000000	0,028177
188Os	стабилен	76_112	175079,747014	931,575753	-8,175455	44	17	2592	0,000000	0,000000	0,001037
189Os	стабилен	76_113	176013,392174	933,645160	-6,106047	33	28	2620	0,000000	0,000000	0,026321
190Os	стабилен	76_114	176945,165217	931,773043	-7,978164	43	18	2638	0,000000	0,000000	0,012498
191Ir	стабилен	77_114	177878,659196	933,493979	-6,775677	37	24	2662	0,144266	0,151707	0,100009
192Pt	стабилен	78_114	178810,566840	931,907644	-8,362011	45	16	2678	0,144266	0,151707	0,000310
193Pt	50 лет	78_115	179743,876756	933,309916	-6,441292	35	26	2704	0,000000	0,000000	0,062735
194Pt	стабилен	78_116	180675,084755	931,207999	-8,543208	46	15	2719	0,000000	0,000000	0,004942
195Pt	стабилен	78_117	181608,545014	933,460259	-6,290949	34	27	2746	0,000000	0,000000	0,027249
196Pt	стабилен	78_118	182540,188486	931,643473	-8,107735	44	17	2763	0,000000	0,000000	0,068756
197Au	стабилен	79_118	183473,188960	933,000473	-7,269183	40	21	2784	0,144266	0,151707	0,163991
198Hg	стабилен	80_118	184404,869599	931,680639	-8,589018	47	14	2798	0,144266	0,151707	0,144962
199Hg	стабилен	80_119	185337,771054	932,901455	-6,849752	37	24	2822	0,000000	0,000000	0,025934
200Hg	стабилен	80_120	186269,308057	931,537003	-8,214205	45	16	2838	0,000000	0,000000	0,148116
201Hg	стабилен	80_121	187202,643030	933,334973	-6,416235	35	26	2864	0,000000	0,000000	0,087792
202Hg	стабилен	80_122	188134,454451	931,811421	-7,939787	43	18	2882	0,000000	0,000000	0,050876
203Tl	стабилен	81_122	189067,533170	933,078719	-7,190934	39	22	2904	0,144266	0,151707	0,056411
204Pb	стабилен	82_122	189999,678717	932,145548	-8,124106	44	17	2921	0,144266	0,151707	0,052385
205Pb	15,3 млн. лет	82_123	190932,512453	932,833736	-6,917472	38	23	2944	0,000000	0,000000	0,144044
206Pb	стабилен	82_124	191863,991145	931,478691	-8,272516	45	16	2960	0,000000	0,000000	0,089805
207Pb	стабилен	82_125	192796,818732	932,827588	-6,923620	38	23	2983	0,000000	0,000000	0,137896
208Pb	стабилен	82_126	193729,016258	932,197525	-7,553682	41	20	3003	0,000000	0,000000	0,065321
209Bi	1,9·10(19) лет	83_126	194664,000254	934,983997	-5,285662	29	32	3035	0,144266	0,151707	0,103389
210Bi	5,012 сут	83_127	195598,961057	934,960802	-4,790405	26	35	3070	0,000000	0,000000	0,041158
211Bi	2,14 мин	83_128	196533,388020	934,426963	-5,324244	29	32	3102	0,000000	0,000000	0,064807
212Bi	60,55 мин	83_129	197468,623613	935,235593	-4,515614	25	36	3138	0,000000	0,000000	0,130119
213Bi	45,59 мин	83_130	198403,004654	934,381041	-5,370167	29	32	3170	0,000000	0,000000	0,018884
214Bi	19,9 мин	83_131	199338,529290	935,524636	-4,226572	23	38	3208	0,000000	0,000000	0,047503
215Bi	7,6 мин	83_132	200272,871859	934,342570	-5,408638	30	31	3239	0,000000	0,000000	0,166243
216Bi	2,17 мин	83_133	201208,591178	935,719318	-4,031889	22	39	3278	0,000000	0,000000	0,056356
217Bi	98,5 с	83_134	202143,032486	934,441308	-5,309899	29	32	3310	0,000000	0,000000	0,079152
218Po	3,10 мин	84_134	203074,063594	931,031108	-9,238547	50	11	3321	0,144266	0,151707	0,052921
219Po	2 мин	84_135	204009,998087	935,934493	-3,816714	21	40	3361	0,000000	0,000000	0,085702
220At	3.71(4) мин	85_135	204943,047743	933,049656	-7,220000	39	22	3383	0,144266	0,151707	0,027345
221Rn	25,7(5) мин	86_135	205874,660104	931,612361	-8,657297	47	14	3397	0,144266	0,151707	0,076683
222Rn	3,8235(3) дней	86_136	206808,055065	933,394961	-6,356247	35	26	3423	0,000000	0,000000	0,147781
223Fr	22,00 мин	87_136	207741,559477	933,504411	-6,765239	37	24	3447	0,144266	0,151707	0,110447
224Ra	3,6319 d	88_136	208673,496836	931,937359	-8,332293	45	16	3463	0,144266	0,151707	0,030028
225Ra	14,9 сут	88_137	209608,158163	934,661327	-5,089880	28	33	3496	0,000000	0,000000	0,113341
226Ra	1,6 тыс. лет	88_138	210541,326864	933,168701	-6,582507	36	25	3521	0,000000	0,000000	0,107350
227Ac	21,772(3) года	89_138	211475,002763	933,675900	-6,593752	36	25	3546	0,144266	0,151707	0,096104
228Th	1,9116(16) года	90_138	212407,418072	932,415309	-7,854344	43	18	3564	0,144266	0,151707	0,136318

Isotopes main stream	Stability -------- Half life	Mnemocode p_n	Isotope mass reference (MeV)	The isotope mass gain per step nr_nucleosynthesis (MeV)	Defect in the growth of the mass of the isotope nucleus with respect to nr = 939,75120755 taking into account e-, u-d, VP (MeV)	The mu neutrino collapsed per step nr_nucleosynthesis (pcs)	The mu-neutrino remains per step nr_nucleosynthesis (pcs)	The mu-neutrino remains to the isotope of all (pcs)	The mass of the broken quarks d per step nr_nucleosynthesis (MeV)	Mass of quarks formed per step nr_nucleosynthesis (MeV)	The mass of gluons_SIF remaining in the isotope per step of nr_nucleosynthesis (MeV)
2	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*
229Th	7,34(16)·10(3) лет	90_139	213341,726083	934,308011	-5,443196	30	31	3595	0,000000	0,000000	0,131684
230Th	7,538(30)·10(4) лет	90_140	214274,497968	932,771885	-6,979323	38	23	3618	0,000000	0,000000	0,082192
231Pa	32,76 тыс. лет	91_140	215208,553824	934,055856	-6,213797	34	27	3645	0,144266	0,151707	0,104401
232U	68,9(4) года	92_140	216141,232932	932,679108	-7,590545	41	20	3665	0,144266	0,151707	0,028458
233U	1,592(2)·10(5) лет	92_141	217075,036166	933,803235	-5,947973	33	28	3693	0,000000	0,000000	0,184396
234U	2,455(6)·10(5) лет	92_142	218007,756912	932,720746	-7,030462	38	23	3716	0,000000	0,000000	0,031053
235U	7,04(1)·10(8) лет	92_143	218942,024776	934,267864	-5,483344	30	31	3747	0,000000	0,000000	0,091537
236U	2,342(3)·10(7) лет	92_144	219875,044717	933,019941	-6,731266	37	24	3771	0,000000	0,000000	0,144420
237Np	2,144 млн лет	93_144	220808,965693	933,920976	-6,348677	35	26	3797	0,144266	0,151707	0,155350
238Pu	87,7(1) лет	94_144	221741,751271	932,785578	-7,484075	41	20	3817	0,144266	0,151707	0,134928
239Pu	2,411(3)·10(4) лет	94_145	222675,670476	933,919206	-5,832002	32	29	3846	0,000000	0,000000	0,114537
240Pu	6,561(7)·10(3) лет	94_146	223608,701596	933,031119	-6,720088	37	24	3870	0,000000	0,000000	0,155598
241Pu	14,290(6) лет	94_147	224543,025536	934,323940	-5,427268	30	31	3901	0,000000	0,000000	0,147613
242Pu	3,75(2)·10(5) лет	94_148	225476,281145	933,255609	-6,495598	35	26	3927	0,000000	0,000000	0,008429
243Am	7,37 тыс. лет	95_148	226410,232953	933,951808	-6,317845	34	27	3954	0,144266	0,151707	0,000353
244Cm	18,10 лет	96_148	227343,004558	932,771605	-7,498048	41	20	3974	0,144266	0,151707	0,120956
245Cm	8,5 тыс. лет	96_149	228277,049609	934,045051	-5,706157	31	30	4004	0,000000	0,000000	0,054553
246Cm	4,76 тыс. лет	96_150	229210,157483	933,107874	-6,643333	36	25	4029	0,000000	0,000000	0,046524
247Cm	15,6 млн. лет	96_151	230144,567400	934,409917	-5,341291	29	32	4061	0,000000	0,000000	0,047760
248Cm	348 тыс. лет	96_152	231077,919792	933,352392	-6,398816	35	26	4087	0,000000	0,000000	0,105211
249Bk	330 сут	97_152	232011,870855	933,951063	-6,318590	35	26	4113	0,144266	0,151707	0,185437
250Cf	13,08 лет	98_152	232944,687078	932,816224	-7,453429	41	20	4133	0,144266	0,151707	0,165574
251Cf	900 лет	98_153	233879,144129	934,457050	-5,294157	29	32	4165	0,000000	0,000000	0,094894
252Cf	2,645 лет	98_154	234812,537506	933,393377	-6,357830	35	26	4191	0,000000	0,000000	0,146197
253Es	20,47 сут	99_154	235747,011137	934,473631	-5,796022	32	29	4220	0,144266	0,151707	0,150517
254Es	275,7 сут	99_155	236681,483464	934,472327	-5,278881	29	32	4252	0,000000	0,000000	0,110171
255Es	39,8 сут	99_156	237615,074318	933,590854	-6,160353	34	27	4279	0,000000	0,000000	0,157844
256Fm	157,6 мин	100_156	238547,965620	932,891302	-7,378351	40	21	4300	0,144266	0,151707	0,054823

Table 5. Main stream of isotopes. Calculation of the change in the extra nuclear components of isotopes for nr_nucleosynthesis (electrons, e-antineutrinos, gamma quanta, free gluons, energy result)

Isotopes main stream	Mnemocode p_n	Mass of burst mu-neutrinos and quarks d by the step of nr_nucleosynthesis (MeV)	Mass of formed electrons per step nr_nucleosynthesis (MeV)	The increase in the ionization energy of electrons, in ST = weight increase of flagellum VF per step of nr_nucleosynthesis (MeV)	Number of departed pairs e-antineutrinos and gamma quanta per step nr_nucleosynthesis (pcs)	The mass of generated e-antineutrinos (1 pcs = 20 eV) per step of nr_nucleosynthesis (MeV)	Mass of gamma-quanta formed and free gluons per step nr_nucleosynthesis (MeV) (the energy result of reactions nr_nucleosynthesis)	The mass fraction of the formed quarks on the mass of column 3 (%)	Mass fraction of electrons of the mass of column 3 (%)	The mass fraction of the antineutrinos of the mass of column 3 (%)	The fraction of the mass of gamma quanta of the mass of column 3 (%)	Estimating the mass fraction of free gluons on the mass of column 3 (%) (= fraction of gluons_SIF)
1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*
1H	1_0	2,0637	0,5109989	0,0000136	2	0,000040	0,968143	16,673%	28,786%	0,0023%	54,538%	0,000%
2H	1_1	2,41578	0,0000000	0,0000000	13	0,000260	2,404749	7,062%	12,193%	0,0072%	80,480%	0,129%
3He	2_1	7,35005	0,5109989	0,0000246	34	0,000680	6,379620	3,928%	8,967%	0,0084%	85,573%	0,762%
4He	2_2	20,8129	0,0000000	0,0000000	112	0,002240	20,711765	1,390%	3,173%	0,0099%	94,581%	0,423%
5He	2_3	0,18583	0,0000000	0,0000000	1	0,000020	0,185808	1,382%	3,155%	0,0099%	94,612%	0,421%
6Li	3_3	5,49175	0,5109989	0,0000054	24	0,000480	4,647941	1,588%	4,062%	0,0098%	93,522%	0,409%
7Li	3_4	7,43317	0,0000000	0,0000000	40	0,000800	7,432374	1,327%	3,393%	0,0099%	94,586%	0,342%
8Be	4_4	19,0573	0,5109989	0,0000093	97	0,001940	18,200261	1,172%	3,189%	0,0100%	95,072%	0,279%
9Be	4_5	1,85829	0,0000000	0,0000000	10	0,000200	1,843844	1,139%	3,099%	0,0100%	95,189%	0,281%
10B	5_5	8,46502	0,5109989	0,0000083	40	0,000800	7,449294	1,216%	3,440%	0,0099%	94,554%	0,390%
11B	5_6	11,7072	0,0000000	0,0000000	63	0,001260	11,571412	1,050%	2,972%	0,0100%	95,138%	0,415%
12C	6_6	17,7565	0,5109989	0,0000113	90	0,001800	16,898866	1,018%	2,960%	0,0101%	95,276%	0,368%
13C	6_7	5,20322	0,0000000	0,0000000	28	0,000560	5,060488	0,969%	2,818%	0,0101%	95,371%	0,416%
14N	7_7	9,39417	0,5109989	0,0000145	45	0,000900	8,449432	1,022%	3,030%	0,0100%	95,055%	0,441%
15N	7_8	11,1498	0,0000000	0,0000000	60	0,001200	10,887290	0,934%	2,769%	0,0101%	95,279%	0,504%
16O	8_8	14,0399	0,5109989	0,0000136	70	0,001400	12,956887	0,949%	2,857%	0,0101%	95,081%	0,551%
17O	8_9	4,4599	0,0000000	0,0000000	24	0,000480	4,197538	0,920%	2,771%	0,0101%	95,052%	0,623%
18O	8_10	8,36232	0,0000000	0,0000000	45	0,000900	8,096487	0,871%	2,622%	0,0101%	95,147%	0,675%
19F	9_10	9,95166	0,5109989	0,0000174	48	0,000960	8,780436	0,911%	2,775%	0,0101%	94,815%	0,745%
20Ne	10_10	14,7832	0,5109989	0,0000216	74	0,001480	13,645707	0,921%	2,833%	0,0101%	94,685%	0,775%
21Ne	10_11	7,06152	0,0000000	0,0000000	38	0,000760	6,831716	0,886%	2,727%	0,0101%	94,762%	0,807%
22Ne	10_12	10,5923	0,0000000	0,0000000	57	0,001140	10,506748	0,839%	2,581%	0,0102%	94,999%	0,785%
23Na	11_12	10,695	0,5109989	0,0000051	52	0,001040	9,635557	0,869%	2,695%	0,0101%	94,814%	0,806%
24Mg	12_12	13,4824	0,5109989	0,0000077	66	0,001320	12,644971	0,885%	2,763%	0,0101%	94,813%	0,764%
25Mg	12_13	7,619	0,0000000	0,0000000	41	0,000820	7,412984	0,856%	2,672%	0,0101%	94,895%	0,783%
26Mg	12_14	11,3356	0,0000000	0,0000000	61	0,001220	11,220999	0,816%	2,546%	0,0102%	95,088%	0,770%
27Al	13_14	10,1375	0,5109989	0,0000060	48	0,000960	9,146975	0,844%	2,648%	0,0101%	94,946%	0,776%
28Si	14_14	13,4824	0,5109989	0,0000082	67	0,001340	12,429828	0,859%	2,708%	0,0101%	94,858%	0,783%
29Si	14_15	8,73398	0,0000000	0,0000000	47	0,000940	8,583872	0,831%	2,621%	0,0102%	94,967%	0,785%
30Si	14_16	10,9639	0,0000000	0,0000000	59	0,001180	10,624948	0,799%	2,520%	0,0102%	95,042%	0,814%
31P	15_16	9,20834	0,5109989	0,0000105	44	0,000880	8,127994	0,826%	2,617%	0,0102%	94,876%	0,836%
32S	16_16	10,695	0,5109989	0,0000104	52	0,001040	9,774913	0,847%	2,694%	0,0101%	94,799%	0,825%
33S	16_17	8,91981	0,0000000	0,0000000	48	0,000960	8,734120	0,823%	2,617%	0,0102%	94,888%	0,831%
34S	16_18	11,7072	0,0000000	0,0000000	63	0,001260	11,497377	0,793%	2,522%	0,0102%	95,008%	0,833%
35Cl	17_18	8,27919	0,5109989	0,0000130	39	0,000780	7,204840	0,820%	2,615%	0,0102%	94,850%	0,853%
36Cl	17_19	8,91981	0,0000000	0,0000000	48	0,000960	8,610157	0,798%	2,546%	0,0102%	94,894%	0,876%
37Cl	17_20	10,5923	0,0000000	0,0000000	57	0,001140	10,400230	0,774%	2,470%	0,0102%	94,993%	0,877%
38Ar	18_20	12,1816	0,5109989	0,0000158	60	0,001200	11,044532	0,790%	2,528%	0,0102%	94,886%	0,893%
39K	19_20	8,27919	0,5109989	0,0000043	39	0,000780	7,226247	0,814%	2,610%	0,0102%	94,753%	0,906%
40K	19_21	7,99066	0,0000000	0,0000000	43	0,000860	7,979151	0,797%	2,555%	0,0102%	94,861%	0,889%
41K	19_22	10,4064	0,0000000	0,0000000	56	0,001120	10,154481	0,775%	2,487%	0,0102%	94,933%	0,897%
42Ca	20_22	12,1816	0,5109989	0,0000061	60	0,001200	11,114486	0,790%	2,540%	0,0102%	94,855%	0,902%
43Ca	20_23	8,17649	0,0000000	0,0000000	44	0,000880	8,060100	0,774%	2,489%	0,0102%	94,929%	0,898%
44Ca	20_24	11,3356	0,0000000	0,0000000	61	0,001220	11,297026	0,753%	2,422%	0,0102%	95,056%	0,879%
45Sc	21_24	8,83668	0,5109989	0,0000066	42	0,000840	7,682504	0,773%	2,492%	0,0102%	94,922%	0,901%
46Ti	22_24	12,1816	0,5109989	0,0000068	60	0,001200	11,249647	0,787%	2,540%	0,0102%	94,882%	0,891%
47Ti	22_25	9,10564	0,0000000	0,0000000	49	0,000980	9,025680	0,771%	2,489%	0,0102%	94,967%	0,882%
48Ti	22_26	11,8931	0,0000000	0,0000000	64	0,001280	11,730588	0,751%	2,425%	0,0102%	95,061%	0,876%
49Ti	22_27	8,36232	0,0000000	0,0000000	45	0,000900	8,293218	0,738%	2,382%	0,0102%	95,134%	0,868%
50Ti	22_28	11,1498	0,0000000	0,0000000	60	0,001200	11,099100	0,721%	2,327%	0,0102%	95,236%	0,853%
51V	23_28	9,95166	0,5109989	0,0000067	48	0,000960	8,918127	0,737%	2,384%	0,0102%	95,150%	0,859%
52Cr	24_28	12,3674	0,5109989	0,0000068	61	0,001220	11,383673	0,749%	2,428%	0,0102%	95,102%	0,856%
53Cr	24_29	8,17649	0,0000000	0,0000000	44	0,000880	8,072564	0,737%	2,389%	0,0102%	95,159%	0,852%
54Cr	24_30	10,0348	0,0000000	0,0000000	54	0,001080	9,774054	0,723%	2,343%	0,0102%	95,202%	0,860%

Isotopes main stream	Mnemocode p_n	Mass of burst mu-neutrinos and quarks d by the step of nr_nucleosynthesis (MeV)	Mass of formed electrons per step nr_nucleosynthesis (MeV)	The increase in the ionization energy of electrons, in ST = weight increase of flagellum VF per step of nr_nucleosynthesis (MeV)	Number of departed pairs e-antineutrinos and gamma quanta per step nr_nucleosynthesis (pcs)	The mass of generated e-antineutrinos (1 pcs = 20 eV) per step of nr_nucleosynthesis (MeV)	Mass of gamma-quanta formed and free gluons per step nr_nucleosynthesis (MeV) (the energy result of reactions nr_nucleosynthesis)	The mass fraction of the formed quarks on the mass of column 3 (%)	Mass fraction of electrons of the mass of column 3 (%)	The mass fraction of the antineutrinos of the mass of column 3 (%)	The fraction of the mass of gamma quanta of the mass of column 3 (%)	Estimating the mass fraction of free gluons on the mass of column 3 (%) (= fraction of gluons_SIF)
1	2	3	4	5	6	7	8	9	10	11	12	13
55Mn	25_30	9,95166	0,5109989	0,0000074	48	0,000960	8,924835	0,738%	2,396%	0,0102%	95,125%	0,865%
56Fe	26_30	11,9958	0,5109989	0,0000079	59	0,001180	11,113761	0,750%	2,438%	0,0102%	95,096%	0,853%
57Fe	26_31	7,99066	0,0000000	0,0000000	43	0,000860	7,672317	0,739%	2,402%	0,0102%	95,109%	0,870%
58Fe	26_32	10,4064	0,0000000	0,0000000	56	0,001120	10,053284	0,726%	2,358%	0,0102%	95,137%	0,885%
59Co	27_32	9,20834	0,5109989	0,0000079	44	0,000880	8,262236	0,741%	2,410%	0,0102%	95,074%	0,883%
60Ni	28_32	11,4383	0,5109989	0,0000079	56	0,001120	10,369080	0,752%	2,451%	0,0102%	95,010%	0,888%
61Ni	28_33	8,17649	0,0000000	0,0000000	44	0,000880	7,834660	0,742%	2,417%	0,0102%	95,022%	0,905%
62Ni	28_34	10,9639	0,0000000	0,0000000	59	0,001180	10,599556	0,728%	2,373%	0,0102%	95,052%	0,918%
63Cu	29_34	7,90754	0,5109989	0,0000077	37	0,000740	7,079818	0,744%	2,427%	0,0102%	95,003%	0,908%
64Zn	30_34	9,58	0,5109989	0,0000094	46	0,000920	8,588602	0,757%	2,472%	0,0102%	94,942%	0,909%
65Zn	30_35	8,17649	0,0000000	0,0000000	44	0,000880	8,152858	0,747%	2,440%	0,0102%	95,004%	0,899%
66Zn	30_36	11,3356	0,0000000	0,0000000	61	0,001220	11,153203	0,734%	2,397%	0,0102%	95,064%	0,897%
67Zn	30_37	7,24734	0,0000000	0,0000000	39	0,000780	7,228246	0,726%	2,370%	0,0102%	95,117%	0,889%
68Zn	30_38	10,4064	0,0000000	0,0000000	56	0,001120	10,360118	0,714%	2,332%	0,0102%	95,187%	0,878%
69Ga	31_38	8,46502	0,5109989	0,0000060	40	0,000800	7,496609	0,728%	2,380%	0,0102%	95,123%	0,879%
70Ge	32_38	10,3233	0,5109989	0,0000079	50	0,001000	9,467678	0,740%	2,420%	0,0102%	95,091%	0,870%
71Ge	32_39	7,619	0,0000000	0,0000000	41	0,000820	7,583671	0,731%	2,393%	0,0102%	95,141%	0,862%
72Ge	32_40	10,9639	0,0000000	0,0000000	59	0,001180	10,905645	0,720%	2,355%	0,0102%	95,209%	0,853%
73Ge	32_41	7,06152	0,0000000	0,0000000	38	0,000760	6,875319	0,713%	2,331%	0,0102%	95,231%	0,857%
74Ge	32_42	10,4064	0,0000000	0,0000000	56	0,001120	10,356392	0,702%	2,297%	0,0102%	95,294%	0,848%
75As	33_42	8,83668	0,5109989	0,0000098	42	0,000840	7,703749	0,715%	2,340%	0,0102%	95,213%	0,861%
76Se	34_42	11,4383	0,5109989	0,0000098	56	0,001120	10,321205	0,725%	2,374%	0,0102%	95,154%	0,869%
77Se	34_43	7,619	0,0000000	0,0000000	41	0,000820	7,589633	0,717%	2,350%	0,0102%	95,200%	0,862%
78Se	34_44	10,7781	0,0000000	0,0000000	58	0,001160	10,587929	0,707%	2,316%	0,0102%	95,244%	0,862%
79Br	35_44	8,27919	0,5109989	0,0000118	39	0,000780	7,126182	0,719%	2,358%	0,0102%	95,162%	0,875%
80Kr	36_44	11,0666	0,5109989	0,0000140	54	0,001080	9,901515	0,729%	2,391%	0,0102%	95,098%	0,886%
81Kr	36_45	8,17649	0,0000000	0,0000000	44	0,000880	7,940105	0,721%	2,366%	0,0102%	95,119%	0,892%
82Kr	36_46	11,3356	0,0000000	0,0000000	61	0,001220	10,968395	0,711%	2,332%	0,0102%	95,142%	0,902%
83Kr	36_47	7,80483	0,0000000	0,0000000	42	0,000840	7,493207	0,704%	2,309%	0,0102%	95,151%	0,913%
84Kr	36_48	10,7781	0,0000000	0,0000000	58	0,001160	10,632827	0,694%	2,278%	0,0102%	95,198%	0,910%
85Rb	37_48	8,83668	0,5109989	0,0000042	42	0,000840	7,957033	0,706%	2,317%	0,0102%	95,159%	0,904%
86Sr	38_48	11,4383	0,5109989	0,0000057	56	0,001120	10,594382	0,714%	2,347%	0,0102%	95,140%	0,894%
87Sr	38_49	8,73398	0,0000000	0,0000000	47	0,000940	8,493084	0,707%	2,322%	0,0102%	95,162%	0,899%
88Sr	38_50	11,3356	0,0000000	0,0000000	61	0,001220	11,260139	0,697%	2,291%	0,0102%	95,218%	0,892%
89Y	39_50	9,02251	0,5109989	0,0000062	43	0,000860	7,857887	0,708%	2,327%	0,0102%	95,148%	0,903%
90Zr	40_50	10,1375	0,5109989	0,0000068	49	0,000980	9,313903	0,717%	2,359%	0,0102%	95,126%	0,894%
91Zr	40_51	7,43317	0,0000000	0,0000000	40	0,000800	7,326502	0,711%	2,339%	0,0102%	95,155%	0,892%
92Zr	40_52	8,91981	0,0000000	0,0000000	48	0,000960	8,720632	0,704%	2,316%	0,0102%	95,182%	0,894%
93Nb	41_52	7,90754	0,5109989	0,0000069	37	0,000740	6,921649	0,715%	2,353%	0,0102%	95,129%	0,896%
94Mo	42_52	10,3233	0,5109989	0,0000071	50	0,001000	9,399864	0,724%	2,383%	0,0102%	95,098%	0,893%
95Mo	42_53	7,619	0,0000000	0,0000000	41	0,000820	7,490149	0,717%	2,363%	0,0102%	95,125%	0,892%
96Mo	42_54	9,4773	0,0000000	0,0000000	51	0,001020	9,201886	0,710%	2,339%	0,0102%	95,145%	0,898%
97Tc	43_54	7,53588	0,5109989	0,0000073	35	0,000700	6,644656	0,721%	2,375%	0,0102%	95,103%	0,895%
98Ru	44_54	10,1375	0,5109989	0,0000074	49	0,000980	9,191133	0,729%	2,404%	0,0102%	95,070%	0,893%
99Ru	44_55	7,80483	0,0000000	0,0000000	42	0,000840	7,493393	0,723%	2,385%	0,0102%	95,077%	0,902%
100Ru	44_56	10,0348	0,0000000	0,0000000	54	0,001080	9,682395	0,716%	2,359%	0,0102%	95,092%	0,911%
101Ru	44_57	7,06152	0,0000000	0,0000000	38	0,000760	6,913510	0,710%	2,342%	0,0102%	95,113%	0,912%
102Ru	44_58	9,4773	0,0000000	0,0000000	51	0,001020	9,332668	0,703%	2,319%	0,0102%	95,146%	0,911%
103Rh	45_58	8,09337	0,5109989	0,0000075	38	0,000760	7,075982	0,713%	2,353%	0,0102%	95,096%	0,914%
104Pd	46_58	10,5091	0,5109989	0,0000083	51	0,001020	9,546001	0,721%	2,380%	0,0102%	95,064%	0,912%
105Pd	46_59	7,43317	0,0000000	0,0000000	40	0,000800	7,126045	0,716%	2,362%	0,0102%	95,070%	0,921%
106Pd	46_60	9,84896	0,0000000	0,0000000	53	0,001060	9,643196	0,709%	2,339%	0,0102%	95,098%	0,922%
107Pd	46_61	6,87569	0,0000000	0,0000000	37	0,000740	6,569526	0,704%	2,323%	0,0102%	95,101%	0,931%
108Pd	46_62	9,4773	0,0000000	0,0000000	51	0,001020	9,347945	0,697%	2,301%	0,0102%	95,134%	0,928%
109Ag	47_62	8,27919	0,5109989	0,0000076	39	0,000780	7,439156	0,707%	2,333%	0,0102%	95,105%	0,923%
110Cd	48_62	10,695	0,5109989	0,0000090	52	0,001040	9,885330	0,714%	2,358%	0,0102%	95,091%	0,913%
111Cd	48_63	7,24734	0,0000000	0,0000000	39	0,000780	7,075294	0,709%	2,342%	0,0102%	95,108%	0,915%
112Cd	48_64	9,66313	0,0000000	0,0000000	52	0,001040	9,496129	0,703%	2,321%	0,0102%	95,137%	0,915%

Isotopes main stream	Mnemocode p_n	Mass of burst mu-neutrinos and quarks d by the step of nr_nucleosynthesis (MeV)	Mass of formed electrons per step nr_nucleosynthesis (MeV)	The increase in the ionization energy of electrons, in ST = weight increase of flagellum VF per step of nr_nucleosynthesis (MeV)	Number of departed pairs e-antineutrinos and gamma quanta per step nr_nucleosynthesis (pcs)	The mass of generated e-antineutrinos (1 pcs = 20 eV) per step of nr_nucleosynthesis (MeV)	Mass of gamma-quanta formed and free gluons per step nr_nucleosynthesis (MeV) (the energy result of reactions nr_nucleosynthesis)	The mass fraction of the formed quarks on the mass of column 3 (%)	Mass fraction of electrons of the mass of column 3 (%)	The mass fraction of the antineutrinos of the mass of column 3 (%)	The fraction of the mass of gamma quanta of the mass of column 3 (%)	Estimating the mass fraction of free gluons on the mass of column 3 (%) (= fraction of gluons_SIF)
1	2	3	4	5	6	7	8	9	10	11	12	13
113In	49_64	7,90754	0,5109989	0,0000058	37	0,000740	6,990763	0,712%	2,352%	0,0102%	95,100%	0,913%
114Sn	50_64	10,3233	0,5109989	0,0000073	50	0,001000	9,379744	0,719%	2,377%	0,0102%	95,072%	0,911%
115Sn	50_65	7,80483	0,0000000	0,0000000	42	0,000840	7,659758	0,714%	2,360%	0,0102%	95,094%	0,911%
116Sn	50_66	9,84896	0,0000000	0,0000000	53	0,001060	9,646922	0,707%	2,338%	0,0102%	95,120%	0,912%
117Sn	50_67	7,24734	0,0000000	0,0000000	39	0,000780	7,010090	0,703%	2,323%	0,0102%	95,130%	0,917%
118Sn	50_68	9,66313	0,0000000	0,0000000	52	0,001040	9,363298	0,697%	2,303%	0,0102%	95,146%	0,922%
119Sn	50_69	6,68986	0,0000000	0,0000000	36	0,000720	6,647322	0,692%	2,289%	0,0102%	95,171%	0,919%
120Sn	50_70	9,4773	0,0000000	0,0000000	51	0,001020	9,110041	0,687%	2,270%	0,0102%	95,179%	0,927%
121Sb	51_70	7,72171	0,5109989	0,0000086	36	0,000720	6,578972	0,695%	2,300%	0,0102%	95,123%	0,936%
122Te	52_70	9,95166	0,5109989	0,0000090	48	0,000960	8,806538	0,703%	2,325%	0,0102%	95,078%	0,942%
123Te	52_71	7,24734	0,0000000	0,0000000	39	0,000780	6,981959	0,698%	2,310%	0,0102%	95,086%	0,948%
124Te	52_72	9,66313	0,0000000	0,0000000	52	0,001040	9,555372	0,693%	2,291%	0,0102%	95,117%	0,945%
125Te	52_73	6,87569	0,0000000	0,0000000	37	0,000740	6,633240	0,688%	2,277%	0,0102%	95,125%	0,949%
126Te	52_74	9,4773	0,0000000	0,0000000	51	0,001020	9,120660	0,683%	2,259%	0,0102%	95,134%	0,957%
127I	53_74	8,09337	0,5109989	0,0000105	38	0,000760	7,063692	0,691%	2,287%	0,0102%	95,092%	0,960%
128Xe	54_74	9,95166	0,5109989	0,0000121	48	0,000960	9,123066	0,698%	2,311%	0,0102%	95,075%	0,953%
129Xe	54_75	7,24734	0,0000000	0,0000000	39	0,000780	6,940973	0,694%	2,297%	0,0102%	95,079%	0,960%
130Xe	54_76	9,4773	0,0000000	0,0000000	51	0,001020	9,404579	0,689%	2,279%	0,0102%	95,112%	0,955%
131Xe	54_77	6,87569	0,0000000	0,0000000	37	0,000740	6,704779	0,685%	2,266%	0,0102%	95,125%	0,957%
132Xe	54_78	9,29147	0,0000000	0,0000000	50	0,001000	8,952355	0,679%	2,249%	0,0103%	95,135%	0,963%
133Cs	55_78	7,90754	0,5109989	0,0000039	37	0,000740	6,994051	0,687%	2,276%	0,0102%	95,103%	0,962%
134Ba	56_78	9,95166	0,5109989	0,0000052	48	0,000960	9,126467	0,694%	2,299%	0,0102%	95,087%	0,955%
135Ba	56_79	7,24734	0,0000000	0,0000000	39	0,000780	7,067470	0,690%	2,286%	0,0102%	95,101%	0,956%
136Ba	56_80	9,4773	0,0000000	0,0000000	51	0,001020	9,108923	0,685%	2,269%	0,0102%	95,108%	0,964%
137Ba	56_81	7,24734	0,0000000	0,0000000	39	0,000780	6,934639	0,681%	2,256%	0,0102%	95,112%	0,971%
138Ba	56_82	8,91981	0,0000000	0,0000000	48	0,000960	8,674430	0,676%	2,240%	0,0103%	95,127%	0,973%
139La	57_82	8,09337	0,5109989	0,0000056	38	0,000760	7,166520	0,684%	2,266%	0,0102%	95,096%	0,972%
140Ce	58_82	9,95166	0,5109989	0,0000055	48	0,000960	9,072566	0,690%	2,288%	0,0102%	95,076%	0,967%
141Pr	59_82	7,16422	0,5109989	0,0000054	33	0,000660	6,031575	0,698%	2,315%	0,0102%	95,027%	0,975%
142Nd	60_82	9,02251	0,5109989	0,0000055	43	0,000860	8,166583	0,705%	2,339%	0,0102%	95,006%	0,970%
143Nd	60_83	6,3182	0,0000000	0,0000000	34	0,000680	6,299907	0,702%	2,327%	0,0102%	95,029%	0,966%
144Nd	60_84	8,17649	0,0000000	0,0000000	44	0,000880	7,828326	0,698%	2,313%	0,0102%	95,033%	0,973%
145Nd	60_85	5,94654	0,0000000	0,0000000	32	0,000640	5,935167	0,694%	2,303%	0,0102%	95,055%	0,969%
146Nd	60_86	7,80483	0,0000000	0,0000000	42	0,000840	7,696459	0,690%	2,289%	0,0102%	95,075%	0,967%
147Pm	61_86	7,35005	0,5109989	0,0000056	34	0,000680	6,204351	0,698%	2,315%	0,0102%	95,027%	0,975%
148Sm	62_86	9,39417	0,5109989	0,0000056	45	0,000900	8,514557	0,704%	2,337%	0,0102%	95,007%	0,971%
149Sm	62_87	6,13237	0,0000000	0,0000000	33	0,000660	5,980887	0,701%	2,326%	0,0102%	95,018%	0,972%
150Sm	62_88	8,17649	0,0000000	0,0000000	44	0,000880	8,167762	0,697%	2,312%	0,0102%	95,048%	0,966%
151Sm	62_89	5,94654	0,0000000	0,0000000	32	0,000640	5,617341	0,694%	2,302%	0,0102%	95,045%	0,974%
152Sm	62_90	8,54815	0,0000000	0,0000000	46	0,000920	8,337821	0,690%	2,288%	0,0102%	95,060%	0,976%
153Eu	63_90	7,72171	0,5109989	0,0000057	36	0,000720	6,808300	0,697%	2,312%	0,0102%	95,032%	0,974%
154Gd	64_90	9,58	0,5109989	0,0000062	46	0,000920	8,419809	0,703%	2,333%	0,0102%	94,993%	0,980%
155Gd	64_91	6,68986	0,0000000	0,0000000	36	0,000720	6,551564	0,700%	2,322%	0,0102%	95,007%	0,980%
156Gd	64_92	8,73398	0,0000000	0,0000000	47	0,000940	8,709564	0,695%	2,308%	0,0102%	95,036%	0,975%
157Gd	64_93	6,68986	0,0000000	0,0000000	36	0,000720	6,400662	0,692%	2,297%	0,0102%	95,039%	0,981%
158Gd	64_94	8,17649	0,0000000	0,0000000	44	0,000880	8,069024	0,688%	2,284%	0,0102%	95,060%	0,979%
159Tb	65_94	7,90754	0,5109989	0,0000059	37	0,000740	7,097513	0,695%	2,307%	0,0102%	95,040%	0,974%
160Dy	66_94	9,20834	0,5109989	0,0000059	44	0,000880	8,390219	0,701%	2,328%	0,0102%	95,025%	0,968%
161Dy	66_95	6,68986	0,0000000	0,0000000	36	0,000720	6,589755	0,698%	2,317%	0,0102%	95,041%	0,967%
162Dy	66_96	8,54815	0,0000000	0,0000000	46	0,000920	8,216726	0,694%	2,304%	0,0102%	95,047%	0,973%
163Dy	66_97	6,50403	0,0000000	0,0000000	35	0,000700	6,408782	0,691%	2,294%	0,0102%	95,062%	0,972%
164Dy	66_98	7,99066	0,0000000	0,0000000	43	0,000860	7,696350	0,687%	2,281%	0,0102%	95,069%	0,976%
165Ho	67_98	8,09337	0,5109989	0,0000060	38	0,000760	7,089765	0,694%	2,303%	0,0102%	95,038%	0,978%
166Er	68_98	9,20834	0,5109989	0,0000061	44	0,000880	8,166102	0,699%	2,324%	0,0102%	95,008%	0,979%
167Er	68_99	6,68986	0,0000000	0,0000000	36	0,000720	6,553986	0,696%	2,313%	0,0102%	95,021%	0,980%
168Er	68_100	7,99066	0,0000000	0,0000000	43	0,000860	7,922889	0,693%	2,301%	0,0102%	95,043%	0,977%
169Tm	69_100	7,35005	0,5109989	0,0000062	34	0,000680	6,536896	0,699%	2,324%	0,0102%	95,022%	0,972%
170Yb	70_100	8,65085	0,5109989	0,0000063	41	0,000820	7,647775	0,705%	2,344%	0,0102%	94,994%	0,973%

Isotopes main stream	Mnemocode p_n	Mass of burst mu-neutrinos and quarks d by the step of nr_nucleosynthesis (MeV)	Mass of formed electrons per step nr_nucleosynthesis (MeV)	The increase in the ionization energy of electrons, in ST = weight increase of flagellum VF per step of nr_nucleosynthesis (MeV)	Number of departed pairs e-antineutrinos and gamma quanta per step nr_nucleosynthesis (pcs)	The mass of generated e-antineutrinos (1 pcs = 20 eV) per step of nr_nucleosynthesis (MeV)	Mass of gamma-quanta formed and free gluons per step nr_nucleosynthesis (MeV) (the energy result of reactions nr_nucleosynthesis)	The mass fraction of the formed quarks on the mass of column 3 (%)	Mass fraction of electrons of the mass of column 3 (%)	The mass fraction of the antineutrinos of the mass of column 3 (%)	The fraction of the mass of gamma quanta of the mass of column 3 (%)	Estimating the mass fraction of free gluons on the mass of column 3 (%) (= fraction of gluons_SIF)
1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*
171Yb	70_101	6,87569	0,0000000	0,0000000	37	0,000740	6,724154	0,702%	2,334%	0,0102%	95,006%	0,974%
172Yb	70_102	8,36232	0,0000000	0,0000000	45	0,000900	8,047304	0,698%	2,321%	0,0102%	95,013%	0,979%
173Yb	70_103	6,68986	0,0000000	0,0000000	36	0,000720	6,415752	0,695%	2,311%	0,0102%	95,017%	0,983%
174Yb	70_104	7,80483	0,0000000	0,0000000	42	0,000840	7,495256	0,692%	2,299%	0,0102%	95,022%	0,988%
175Lu	71_104	7,35005	0,5109989	0,0000054	34	0,000680	6,412819	0,698%	2,322%	0,0102%	94,994%	0,988%
176Hf	72_104	8,65085	0,5109989	0,0000075	41	0,000820	7,483276	0,704%	2,341%	0,0102%	94,956%	0,994%
177Hf	72_105	6,68986	0,0000000	0,0000000	36	0,000720	6,447796	0,701%	2,332%	0,0102%	94,962%	0,997%
178Hf	72_106	7,99066	0,0000000	0,0000000	43	0,000860	7,632076	0,698%	2,320%	0,0102%	94,965%	1,004%
179Hf	72_107	6,3182	0,0000000	0,0000000	34	0,000680	6,250910	0,695%	2,311%	0,0102%	94,981%	1,002%
180Hf	72_108	7,619	0,0000000	0,0000000	41	0,000820	7,527223	0,692%	2,300%	0,0102%	94,999%	1,000%
181Ta	73_108	7,72171	0,5109989	0,0000079	36	0,000720	6,905366	0,698%	2,321%	0,0102%	94,981%	0,995%
182W	74_108	9,02251	0,5109989	0,0000080	43	0,000860	7,909682	0,703%	2,339%	0,0102%	94,948%	0,999%
183W	74_109	6,50403	0,0000000	0,0000000	35	0,000700	6,248565	0,701%	2,330%	0,0102%	94,953%	1,003%
184W	74_110	7,619	0,0000000	0,0000000	41	0,000820	7,575102	0,697%	2,319%	0,0102%	94,974%	1,000%
185Re	75_110	7,35005	0,5109989	0,0000079	34	0,000680	6,200257	0,704%	2,340%	0,0102%	94,934%	1,006%
186Os	76_110	8,27919	0,5109989	0,0000085	39	0,000780	7,395936	0,709%	2,360%	0,0102%	94,915%	1,003%
187Os	76_111	6,50403	0,0000000	0,0000000	35	0,000700	6,446974	0,707%	2,350%	0,0102%	94,931%	1,001%
188Os	76_112	8,17649	0,0000000	0,0000000	44	0,000880	8,173538	0,703%	2,339%	0,0102%	94,956%	0,996%
189Os	76_113	6,13237	0,0000000	0,0000000	33	0,000660	6,079066	0,700%	2,330%	0,0102%	94,971%	0,994%
190Os	76_114	7,99066	0,0000000	0,0000000	43	0,000860	7,964806	0,697%	2,319%	0,0102%	94,994%	0,990%
191Ir	77_114	7,16422	0,5109989	0,0000091	33	0,000660	6,156589	0,703%	2,340%	0,0102%	94,963%	0,992%
192Pt	78_114	8,65085	0,5109989	0,0000089	41	0,000820	7,842463	0,709%	2,358%	0,0102%	94,949%	0,987%
193Pt	78_115	6,50403	0,0000000	0,0000000	35	0,000700	6,377857	0,706%	2,349%	0,0102%	94,961%	0,987%
194Pt	78_116	8,54815	0,0000000	0,0000000	46	0,000920	8,537347	0,702%	2,337%	0,0102%	94,986%	0,982%
195Pt	78_117	6,3182	0,0000000	0,0000000	34	0,000680	6,263020	0,700%	2,329%	0,0102%	95,001%	0,980%
196Pt	78_118	8,17649	0,0000000	0,0000000	44	0,000880	8,038098	0,696%	2,318%	0,0102%	95,017%	0,979%
197Au	79_118	7,72171	0,5109989	0,0000092	36	0,000720	6,586052	0,702%	2,337%	0,0102%	94,981%	0,985%
198Hg	80_118	9,02251	0,5109989	0,0000104	43	0,000860	7,924777	0,707%	2,355%	0,0102%	94,952%	0,988%
199Hg	80_119	6,87569	0,0000000	0,0000000	37	0,000740	6,823078	0,705%	2,345%	0,0102%	94,969%	0,985%
200Hg	80_120	8,36232	0,0000000	0,0000000	45	0,000900	8,065189	0,701%	2,334%	0,0102%	94,976%	0,989%
201Hg	80_121	6,50403	0,0000000	0,0000000	35	0,000700	6,327742	0,699%	2,325%	0,0102%	94,985%	0,991%
202Hg	80_122	7,99066	0,0000000	0,0000000	43	0,000860	7,888051	0,695%	2,315%	0,0102%	95,002%	0,989%
203Tl	81_122	7,53588	0,5109989	0,0000061	35	0,000700	6,615404	0,701%	2,334%	0,0102%	94,979%	0,988%
204Pb	82_122	8,46502	0,5109989	0,0000074	40	0,000800	7,552502	0,706%	2,352%	0,0102%	94,959%	0,986%
205Pb	82_123	7,06152	0,0000000	0,0000000	38	0,000760	6,772668	0,704%	2,343%	0,0102%	94,963%	0,990%
206Pb	82_124	8,36232	0,0000000	0,0000000	45	0,000900	8,181812	0,700%	2,332%	0,0102%	94,976%	0,991%
207Pb	82_125	7,06152	0,0000000	0,0000000	38	0,000760	6,784964	0,698%	2,323%	0,0102%	94,980%	0,995%
208Pb	82_126	7,619	0,0000000	0,0000000	41	0,000820	7,487541	0,695%	2,313%	0,0102%	94,994%	0,994%
209Bi	83_126	5,67758	0,5109989	0,0000123	25	0,000500	4,663354	0,701%	2,334%	0,0102%	94,962%	0,997%
210Bi	83_127	4,83156	0,0000000	0,0000000	26	0,000520	4,748727	0,699%	2,328%	0,0102%	94,970%	0,996%
211Bi	83_128	5,38905	0,0000000	0,0000000	29	0,000580	5,258858	0,697%	2,321%	0,0102%	94,978%	0,997%
212Bi	83_129	4,64573	0,0000000	0,0000000	25	0,000500	4,384995	0,695%	2,315%	0,0102%	94,977%	1,002%
213Bi	83_130	5,38905	0,0000000	0,0000000	29	0,000580	5,350703	0,693%	2,308%	0,0102%	94,989%	1,000%
214Bi	83_131	4,27408	0,0000000	0,0000000	23	0,000460	4,178608	0,691%	2,303%	0,0102%	94,996%	1,000%
215Bi	83_132	5,57488	0,0000000	0,0000000	30	0,000600	5,241795	0,689%	2,296%	0,0102%	94,993%	1,006%
216Bi	83_133	4,08825	0,0000000	0,0000000	22	0,000440	3,975093	0,688%	2,291%	0,0102%	94,998%	1,007%
217Bi	83_134	5,38905	0,0000000	0,0000000	29	0,000580	5,230168	0,686%	2,284%	0,0102%	95,004%	1,008%
218Po	84_134	9,58	0,5109989	0,0000084	46	0,000920	8,666287	0,691%	2,300%	0,0102%	94,988%	1,006%
219Po	84_135	3,90242	0,0000000	0,0000000	21	0,000420	3,730592	0,689%	2,295%	0,0102%	94,989%	1,008%
220At	85_135	7,53588	0,5109989	0,0000092	35	0,000700	6,673536	0,694%	2,313%	0,0102%	94,970%	1,006%
221Rn	86_135	9,02251	0,5109989	0,0000108	43	0,000860	8,061335	0,699%	2,330%	0,0102%	94,951%	1,005%
222Rn	86_136	6,50403	0,0000000	0,0000000	35	0,000700	6,207766	0,697%	2,322%	0,0102%	94,953%	1,009%
223Fr	87_136	7,16422	0,5109989	0,0000040	33	0,000660	6,135713	0,702%	2,340%	0,0102%	94,925%	1,011%
224Ra	88_136	8,65085	0,5109989	0,0000053	41	0,000820	7,783026	0,707%	2,356%	0,0102%	94,909%	1,009%
225Ra	88_137	5,20322	0,0000000	0,0000000	28	0,000560	4,975979	0,705%	2,350%	0,0102%	94,911%	1,012%
226Ra	88_138	6,68986	0,0000000	0,0000000	36	0,000720	6,474436	0,703%	2,342%	0,0102%	94,918%	1,014%
227Ac	89_138	6,97839	0,5109989	0,0000051	32	0,000640	5,978589	0,708%	2,360%	0,0102%	94,891%	1,015%
228Th	90_138	8,27919	0,5109989	0,0000061	39	0,000780	7,198827	0,713%	2,376%	0,0102%	94,865%	1,018%

Isotopes main stream	Mnemocode p_n	Mass of burst mu-neutrinos and quarks d by the step of nr_nucleosynthesis (MeV)	Mass of formed electrons per step nr_nucleosynthesis (MeV)	The increase in the ionization energy of electrons, in ST = weight increase of flagellum VF per step of nr_nucleosynthesis (MeV)	Number of departed pairs e-antineutrinos and gamma quanta per step nr_nucleosynthesis (pcs)	The mass of generated e-antineutrinos (1 pcs = 20 eV) per step of nr_nucleosynthesis (MeV)	Mass of gamma-quanta formed and free gluons per step nr_nucleosynthesis (MeV) (the energy result of reactions nr_nucleosynthesis)	The mass fraction of the formed quarks on the mass of column 3 (%)	Mass fraction of electrons of the mass of column 3 (%)	The mass fraction of the antineutrinos of the mass of column 3 (%)	The fraction of the mass of gamma quanta of the mass of column 3 (%)	Estimating the mass fraction of free gluons on the mass of column 3 (%) (= fraction of gluons_SIF)
1	2	3	4	5	6	7	8	9	10	11	12	13
229Th	90_139	5,57488	0,0000000	0,0000000	30	0,000600	5,310912	0,711%	2,369%	0,0102%	94,866%	1,022%
230Th	90_140	7,06152	0,0000000	0,0000000	38	0,000760	6,896371	0,708%	2,361%	0,0102%	94,876%	1,022%
231Pa	91_140	6,60673	0,5109989	0,0000059	30	0,000600	5,590376	0,714%	2,379%	0,0102%	94,848%	1,024%
232U	92_140	7,90754	0,5109989	0,0000062	37	0,000740	7,042928	0,719%	2,396%	0,0102%	94,832%	1,022%
233U	92_141	6,13237	0,0000000	0,0000000	33	0,000660	5,762917	0,716%	2,388%	0,0102%	94,829%	1,028%
234U	92_142	7,06152	0,0000000	0,0000000	38	0,000760	6,998649	0,714%	2,380%	0,0102%	94,844%	1,026%
235U	92_143	5,57488	0,0000000	0,0000000	30	0,000600	5,391207	0,712%	2,373%	0,0102%	94,850%	1,028%
236U	92_144	6,87569	0,0000000	0,0000000	37	0,000740	6,586106	0,709%	2,365%	0,0102%	94,853%	1,031%
237Np	93_144	6,79256	0,5109989	0,0000062	31	0,000620	5,674288	0,715%	2,383%	0,0102%	94,821%	1,036%
238Pu	94_144	7,90754	0,5109989	0,0000061	37	0,000740	6,829988	0,719%	2,399%	0,0102%	94,795%	1,038%
239Pu	94_145	5,94654	0,0000000	0,0000000	32	0,000640	5,716824	0,717%	2,392%	0,0102%	94,799%	1,041%
240Pu	94_146	6,87569	0,0000000	0,0000000	37	0,000740	6,563750	0,715%	2,384%	0,0102%	94,801%	1,045%
241Pu	94_147	5,57488	0,0000000	0,0000000	30	0,000600	5,279055	0,713%	2,377%	0,0102%	94,801%	1,050%
242Pu	94_148	6,50403	0,0000000	0,0000000	35	0,000700	6,486469	0,711%	2,370%	0,0102%	94,817%	1,047%
243Am	95_148	6,60673	0,5109989	0,0000060	30	0,000600	5,798472	0,716%	2,387%	0,0102%	94,800%	1,043%
244Cm	96_148	7,90754	0,5109989	0,0000061	37	0,000740	6,857933	0,720%	2,403%	0,0102%	94,776%	1,045%
245Cm	96_149	5,76071	0,0000000	0,0000000	31	0,000620	5,650984	0,718%	2,396%	0,0102%	94,785%	1,045%
246Cm	96_150	6,68986	0,0000000	0,0000000	36	0,000720	6,596090	0,716%	2,388%	0,0102%	94,798%	1,044%
247Cm	96_151	5,38905	0,0000000	0,0000000	29	0,000580	5,292950	0,714%	2,382%	0,0102%	94,806%	1,043%
248Cm	96_152	6,50403	0,0000000	0,0000000	35	0,000700	6,292905	0,712%	2,375%	0,0102%	94,813%	1,045%
249Bk	97_152	6,79256	0,5109989	0,0000063	31	0,000620	5,614114	0,717%	2,392%	0,0102%	94,779%	1,051%
250Cf	98_152	7,90754	0,5109989	0,0000064	37	0,000740	6,768696	0,722%	2,407%	0,0102%	94,751%	1,055%
251Cf	98_153	5,38905	0,0000000	0,0000000	29	0,000580	5,198683	0,720%	2,401%	0,0102%	94,755%	1,057%
252Cf	98_154	6,50403	0,0000000	0,0000000	35	0,000700	6,210933	0,718%	2,394%	0,0102%	94,758%	1,060%
253Es	99_154	6,23507	0,5109989	0,0000065	28	0,000560	5,126526	0,723%	2,411%	0,0102%	94,727%	1,064%
254Es	99_155	5,38905	0,0000000	0,0000000	29	0,000580	5,168130	0,721%	2,405%	0,0102%	94,730%	1,067%
255Es	99_156	6,3182	0,0000000	0,0000000	34	0,000680	6,001829	0,719%	2,398%	0,0102%	94,731%	1,071%
256Fm	100_156	7,72171	0,5109989	0,0000066	36	0,000720	6,804389	0,723%	2,413%	0,0102%	94,713%	1,070%

In the above tables, to save space, the accuracy of the presentation of the calculation results is limited, and only the values of the parameter values change for each step of nr_nucleosynthesis are presented. Made only one exception - in column 10 of Table. 4, we have still displayed the total number of mu-neutrinos remaining in the isotope, from the very beginning of the process of nr-nucleosynthesis.

Note that in the 56Fe isotope there are 504 mu-neutrinos (exactly 9 mu-neutrinos per each nucleon, as predicted in the construction of S_structures of nucleon). After the 56Fe isotope, the number of bursting mu-neutrinos per one nucleon decreases, and the number of remaining mu-neutrinos per nucleon becomes larger than 9 pcs.

<u>Remark:</u>

The range of the change in the number of mu-neutrinos from the maximum number of 61 pcs. in the relic neutron to a minimum of 9 pcs. in all nucleons of the 56Fe isotope is one of the key consequences of S_theory. It is this range of changes in the number of mu-neutrinos in nucleons that provides, on the one hand, the balance and stability of the S_design of nucleons, on the other hand, the process of successive addition of relic neutrons (with 61 mu neutrinos) and mu-neutrino bursts in nucleons in an amount from 1 pc. up to 52 pcs. provides primary nr_nucleosynthesis of the entire spectrum of isotopes. The output of the number of mu-neutrinos in a nucleon beyond this range (9-61) is inadmissible and leads to nucleon destruction.

The values of the remaining parameters-total from the beginning of nr_nucleosynthesis, as well as the values of the parameters for one nucleon are calculated trivially, to save space, we do not show them in the table.

Parameter values for one nucleon are shown below in the form of graphs and are the main tool for analyzing the calculation results.

Analysis of the connection between strong interaction forces (SIF) and elements of S_models of nucleons

Of course, the "main character", which unites nucleons in the nucleus are the forces of strong interaction (SIF).

The S-models of nucleons, described in the previous chapter, have three obligatory elements ensuring the emergence and realization of forces of strong interaction:

The first is that the attraction of nucleons (forces of strong interaction) is provided by specific elements of the N-design of nucleons - slit magnets (SM).

The second is the deformation of the nucleons, when they are joined into the nucleus, leads to the bursting of the mu-neutrinos in them. The burst mu-neutrinos form additional voids (holes) in the slit magnets, which lead to an increase in the magnetic strength of the slit magnets, i. E. to an increase in the force of attraction of nucleons.

The third - as carriers of forces of strong interaction are micromagnets - gluons, from which power flagellums of attraction between slit magnets are built. The necessary number of gluons is formed by shortening the simples-spirales, to which the bursting mu-neutrinos disintegrate (quantization of the length by dropping the TEV turns).

Virtual photons-micromagnets (VF-M) for carrying out the role of carriers of strong interaction forces do not fit. as have larger diameter than gluons, and flagellums formed from VP-M can not "get through" holes formed in slit magnets, and also into narrow gaps between star-like tau-neutrinos in the region close to SM.

As we see, all the elements ensuring the emergence and operation of forces of strong interaction are purely electro-magnetic in nature. The increased of SIF among other electro-magnetic interactions is explained by the special shape of slit magnets and the particularly small size of the working elements (gluons) that form the power flagellums between the slit magnets.

The special undulating shape of the azimuthal electric vortices forming the slit magnets probably forms a "nonstandard" magnetic field that permeates all the slit magnets along which the chains of gluons line up and "sew" (pull together) all nucleons of the nucleus into a single aggregate.

Let us analyze successively how the listed elements of the S_models of nucleons are related (correlated) to known data about SIF.

S_analysis of the relationship of SIF to the number of burst mu-neutrinos (holes)

Let us plot the average number of burst mu-neutrinos per nucleon on average:

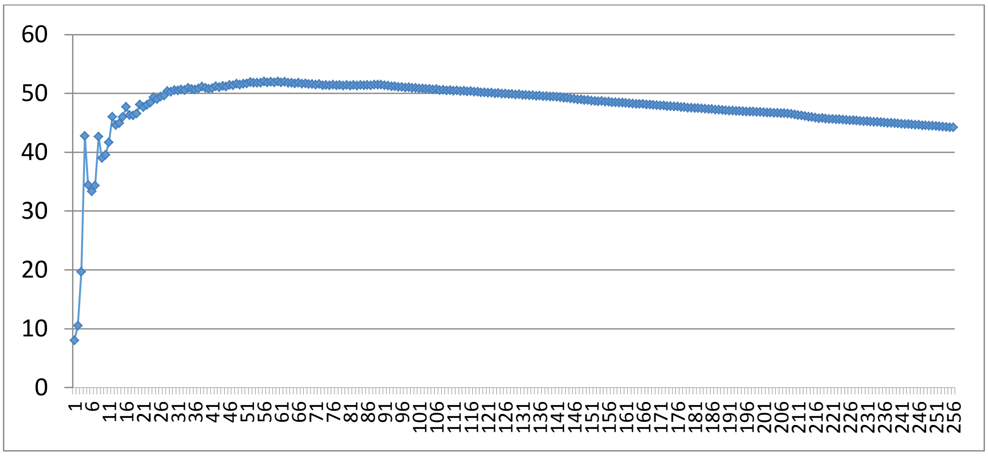


Fig. 4_8. The average number of burst mu-neutrinos per nucleon (pcs)

As you can see, the obtained graph very much resembles the well-known graph of the binding energy of nucleons in atomic nuclei, with very small differences:

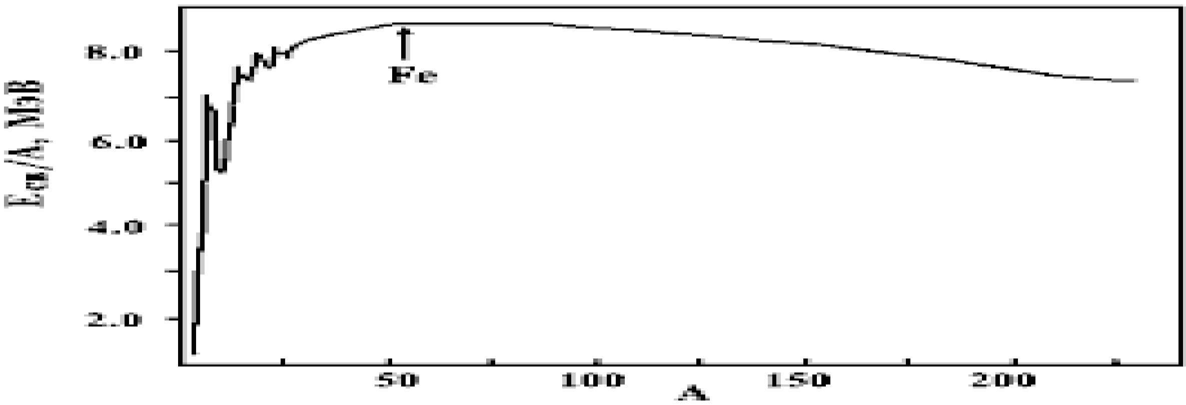


Fig. 4_9. The binding energy of nucleons in atomic nuclei

However, this is not surprising - both of these graphs were calculated on the basis of a defect in the masses of the nuclei of the same isotopes. Only the known graph of the binding energy of nucleons takes into account the mass defect of the nuclei relative to the reference masses of protons and neutrons, and the graph of the average number of burst mu-neutrinos per nucleon takes into account the mass defect of the nuclei relative to the relic neutron mass, which, as we know, correlates with each other.

As for the differences, they are related to the "finer" structure and the calculation of the change in the components of atomic nuclei in S_theory as compared to the structure of atomic nuclei from standard protons and neutrons used to calculate the energy of the binding energy.

We would like to draw your attention to the fact that in our variant (according to S_theory) this graph (having of a very nontrivial form) received a concrete physical interpretation (physical model), the dependence of the binding energy of nucleons in the nucleus of an atom on the number of burst mu- neutrinos.

After we found the correlation of the Nucleon Coupling Energy (in the Standard Model) with the number of bursting mu-neutrinos (in S_theory), let us plot the graph of the mu-neutrinos remaining in the isotope per one nucleon on average, see Fig. 4_10.

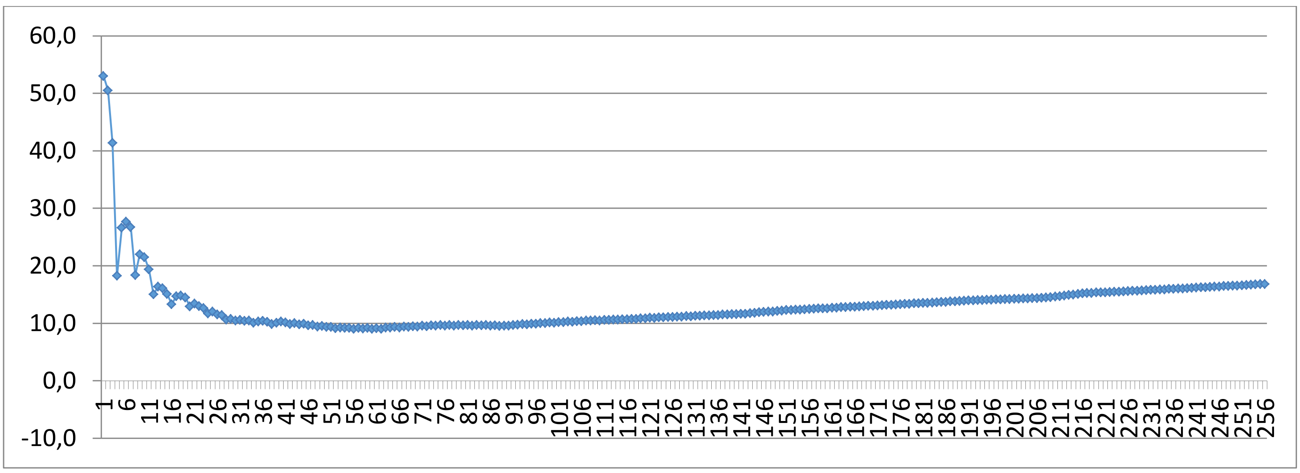
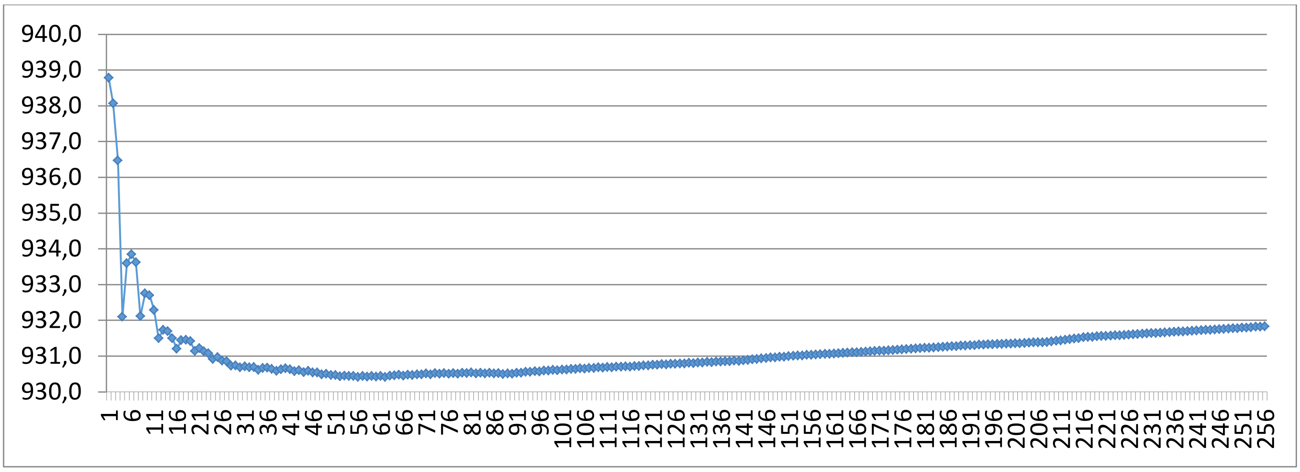


Fig. 4_10. The number of mu-neutrinos remaining in the isotope,

per one nucleon (pcs)

The inverse correlation of this graph with graph of the energy of binding is obvious. However, this is also not surprising; physically, the number of burst mu-neutrinos and the number of mu-neutrinos remaining in the isotope are additional values up to the number of mu neutrinos in the relic neutron (61 pcs.).

The last graph also correlates well with the graph of the average isotope mass per nucleon (see Fig. 4_11).



ig. 4_11. The average isotope mass per nucleon

This correlation is explained by the physical correspondence of these parameters to each other.

In fact, we quantized the mass defect parameter by translating it from analytic mathematics, operating with continuous quantities, to integer "arithmetic", which operates with the number of burst and remaining mu-neutrinos. True, for this we had to "invent" the physics of the simples and construct a series of S-models of basic particles and the processes of their formation and transformation.

In a special chapter, we will examine how the integer "arithmetic" of the bursting and remaining mu-neutrinos in "modern" nuclear reactions works.

Remarks on reference isotope masses based on the results of data calculation in Table. 4 and 5 (correction of reference masses of isotopes_main stream).

For the rigor of the presentation, we want to note that in the calculation of the main stream, we made two changes to the reference (reference) isotope masses.

The first change concerns the mass of the isotope 5He. The reference value of the mass of the isotope 5He is 5.012220 (50) aem (or 4668.853162 MeV). In this case, the increase in the mass of the isotope 5He relative to the 4He isotope (3728.40115978 MeV) would be 940.452002 MeV, which exceeds the value of the relic neutron mass of 939.75120755 MeV.

According to S_theory, at any step of nr_nucleosynthesis, the mass gain is greater than the mass of the relic neutron it can not be. In addition, with the addition of a relic neutron to the nucleus, at least one mu-neutrino must burst. Therefore, the reference mass of the 5He isotope is erroneous, which is explained by the fact that this isotope is absent in nature and it is impossible to accurately determine its mass (the half-life of the isotope 5He is 700 (30) • 10^{-24} s).

The maximum mass of the He5 isotope can be:

5He = 4He + nr - $\nu\mu$ = 3728.40115978 + 939.75120755 - 0.18582935 =

= 4667.96654 (MeV) = 5.01126817 (aem)

It is this mass that we took as the calculation for the 5He isotope in the main stream isotope table, which means that when a relic neutron was added to 4He and the isotope 5He was formed, and one mu-neutrino burst.

The deviation of the accepted mass of 5He from its reference mass was -0.001 (aem) or -0.02%.

The second change concerns the mass of the isotope 7Li and is related not to the given isotope, but to the amount of the remaining mu-neutrinos in the 56Fe isotope. Above, proceeding from the "design" of slotted magnets, we asserted that the minimum amount of the remaining mu-neutrinos in a single slit magnet should be. 3 pieces, i.e. 9 pcs. per nucleon. Hence, in the 56Fe isotope, 504 mu-neutrinos should remain to the whole isotope (56 * 9 = 504). In fact, when calculating using the reference masses of all isotopes (taking into account the correction of the mass of the isotope 5He, as we wrote above), the estimated number of remaining mu-neutrinos in the 56Fe isotope is 503 pcs. The shortage of the mu-neutrinos remaining in the isotope is 1 pc.

Where has this missing mu-neutrino gone? "Obviously," according to the "mathematics" performed on the basis of the reference isotope masses in some isotope, it "burst" at one mu-neutrino more than "in fact".

The "suspected" isotopes in which such a "mistake" could occur only one is 7Li, the calculated fractional number of mu-neutrino bursts (40,041) crossed the cut-off line of the integer number of burst mu-neutrinos by 0.0141 (νμ) or 0, 00282 MeV or 0.00000004% by weight of the isotope.

"Impartial" mathematics rounded the number of burst mu neutrinos in 7Li to a larger integer value (41 pcs.). But the physicist should ask himself - what is the accuracy of measuring isotope masses? After all, if the mass of the isotope is slightly larger, then the mass defect relative to the relic neutron becomes slightly less and the number of bursting mu-neutrinos is also smaller, and the number of remaining mu-neutrinos is correspondingly larger.

As a result of these calculations and arguments, we assume that the mass of the isotope 7Li is slightly greater than the reference 7,016,00455 (aem) and is equal to 7,016,007,366 (aem) or 6535,369193 (MeV). The mass defect in this case became equal to 7.433174 (MeV) or 39.999999999 (νμ). This means that in the synthesis of the 7Li isotope, 40 mu-neutrinos, rather than 41, burst. The recalculation of the entire Tabl. 4 gives the number of remaining mu-neutrinos in the 56Fe isotope equal to 504 pcs. exactly 9 pieces. in each nucleon.

The deviation of the mass of 7Li taken in ST from the reference mass was 0.00000282 (a) or 0.00262 MeV or 0.00004%,

Other contradictions in the reference isotope masses with positions of S_theory in the calculation of the reactions of nr_nucleosynthesis in the main-stream table were not revealed.

S_analysis of the SIF bond with the amount (mass) of gluons remaining in the core

By analogy with the previous graphs, we construct a graph of the mass of the gluons_SIF per one nucleon in the mean:

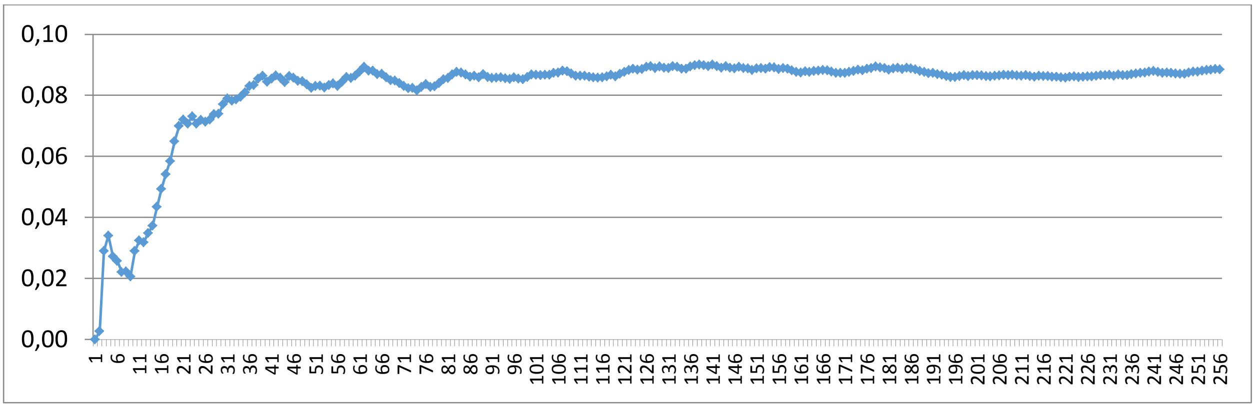


Fig. 4_12. The mass of gluon_SIF per nucleon (MeV)

A graph was obtained, in which there is also some correlation with the same graph of the binding energy of nucleons (bursting mu-neutrinos), but only somehow "schematically". What is the reason for the difference between these charts?

S_analysis of the difference between the graphs of the burst mu-neutrinos and the formed gluons_SIF

For this analysis, we give graphs of mu-neutrino bursting at each step of nr_nucleosynthesis (column 8 of table 4) and a graph of the formation of gluons-SIF also at each step of nr_nucleosynthesis (column 13 of Table 4).

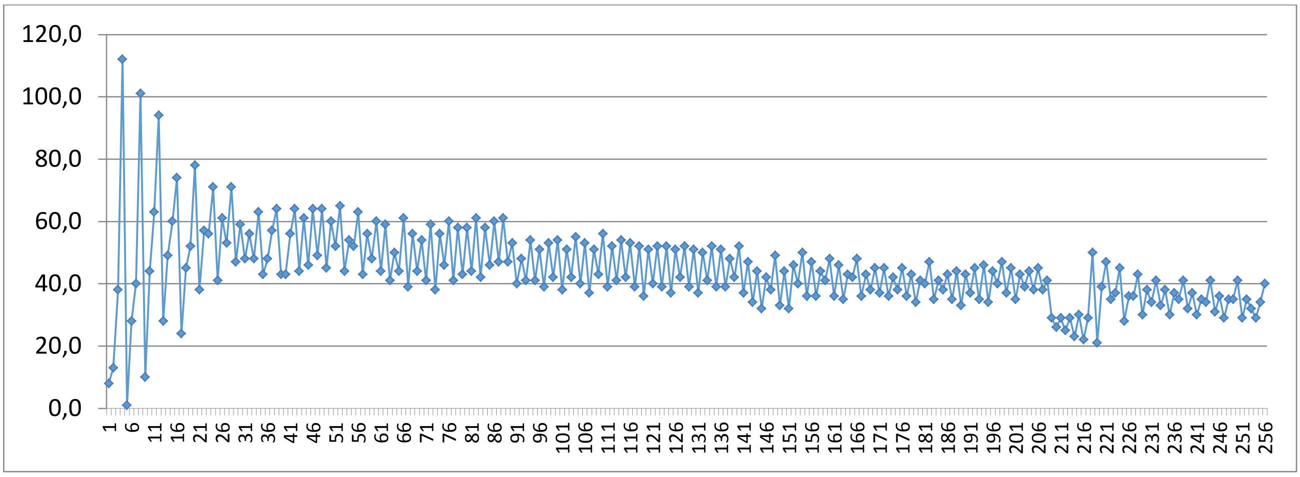


Fig. 4_13. The mu-neutrino burst at each step of nr_nucleosynthesis (pcs)

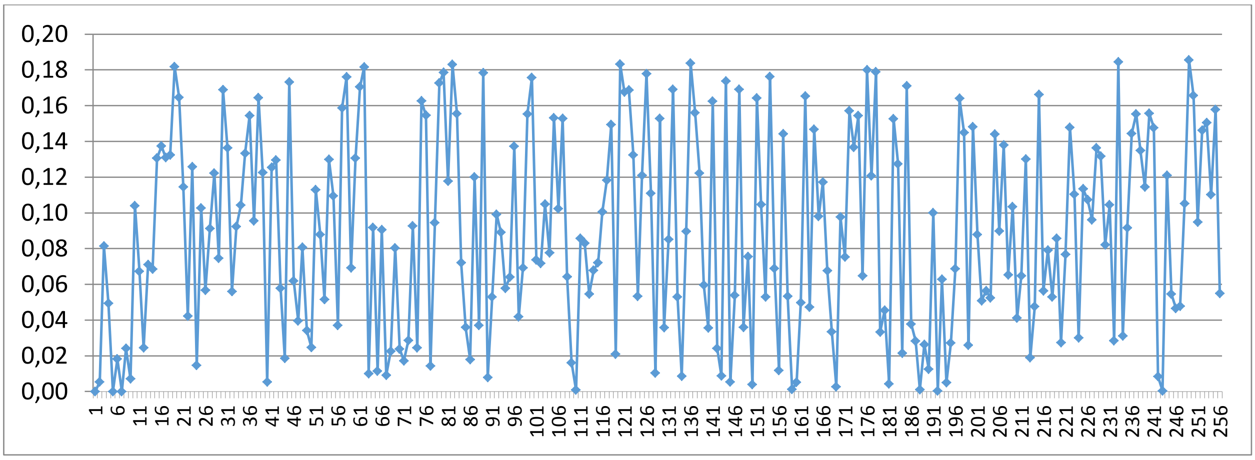


Fig. 4_14. The mass of the gluons remaining in the isotope at each step of nr_nucleosynthesis (MeV)

The graphs 4_13 and 4_14 differ significantly from each other, although, at first glance, it would seem that there must be a direct relationship between them.

In fact, in place of the bursting mu neutrino in the slit magnet, a "hole" is formed, which is immediately occupied by the resulting flagellum gluons_SIF. The more the mu-neutrino bursts, the more "holes", the more gluons-SIF, and hence their mass.

However, the proposed scheme for the formation and "work" of the forces of strong interaction also contains a nonlinear element that distorts the direct proportion between the burst mu-neutrinos and the resulting flagellum of the gluons_SIF. The flagellum gluons_SIF tighten the nucleons in the nucleus, both locally in separate regions, and globally through "through holes" that permeate all the nucleons of the nucleus. And the more "through holes" formed, the more "tightly" the nucleons are pressed to each other and they are compressed most tightly in the 56Fe isotope, which has 61-9 = 52 "through holes". The formation of "through holes" and, as a consequence, a more dense compression of nucleons leads to a decrease in the length of the flagellum of the gluons_SIF and, as it were, to a decrease in their mass.

Why "as it were", but because, as calculation shows, the increase in mass (energy) of gluons_SIF at each step of nr_nucleosynthesis is always positive, it is never negative, just as mu neutrinos inside nucleons can only burst and never are formed again. True, this circumstance (mandatory growth of the mass of gluons_SIF) is a purely mathematical property of our algorithm for calculating their mass (energy), as the difference between the integer and fractional number of burst mu-neutrinos (which is equivalent to calculating the mass of gluons_SIF as the residue of the mass of the isotope minus the mass of all other components isotope).

Unfortunately, we could not propose other a physical model for calculating the number of gluons in the nucleus. Rather, it will be later denoted as a standing gluon wave (SGW), but an acceptable algorithm for calculating the SGW and, as a consequence, the amount (mass, energy) of gluons_SIF for this model will not be proposed. This is a question of future research.

The most intensive formation of "through holes" occurs when there is nr_nucleosynthesis of isotopes in the interval from A = 3 to A = 20 (the region of thermonuclear reactions), which leads to a " failure of the schedule" of the mass-energy graph of gluons_SIF per nucleon in a given range of isotopes.

This nonlinear dependence of the number of burst mu-neutrinos and formed gluons_SIF at each step of nr_nucleosynthesis explains the difference in the graphs of their number per one nucleon (Figures 4_8 and 4_12), although there is a certain correlation between them.

S_analysis of other decay products of bursted simples

So far, in describing and analyzing the process of primary nr-nucleosynthesis, we have paid attention to objects that are directly related to the origin and action of strong interaction forces - slit magnets, bursting and remaining mu-neutrinos, holes in the place of the burst mu-neutrinos, and gluons_SIF.

We will now deal with the "fate" of other products of the collapse of the bursting simples that have flown out of the nucleus during the process of nr_nucleosynthesis and are not involved in strong interaction.

In Table 5, we have already calculated the number (mass, energy) of all these components - electrons, e-antineutrinos, gamma quanta and free gluons.

It is these components that carry away the "remnants" of the mass (energy) from the bursting mu-neutrinos and quarks from the nucleus, minus the mass (energy) of the new quarks and gluons_SIF that went to the formation. In fact, these new components are the physical embodiment of the emerging mass defect and the energy result of the reactions of nr_nucleosynthesis.

Taking into account the fact that calculations are based on the masses of isotopes, and remembering our assumption that the capture of the formed electrons by nuclei (formation of isotopes) can occur in parallel with the reactions of nr_nucleosynthesis, we exclude electrons from the mass defect of isotopes.

We are interested in how the remaining (real) mass defect of isotopes (mass Y) is distributed among the remaining components that flew from the nucleus of isotope (e-antineutrinos, gamma quanta and free gluons).

For the beginning, we construct a graph of the total mass (L) - of the broken mu-neutrino and simples of quark d per one nucleon of the isotope (graph 3, Table 5), see Fig. 4_15.

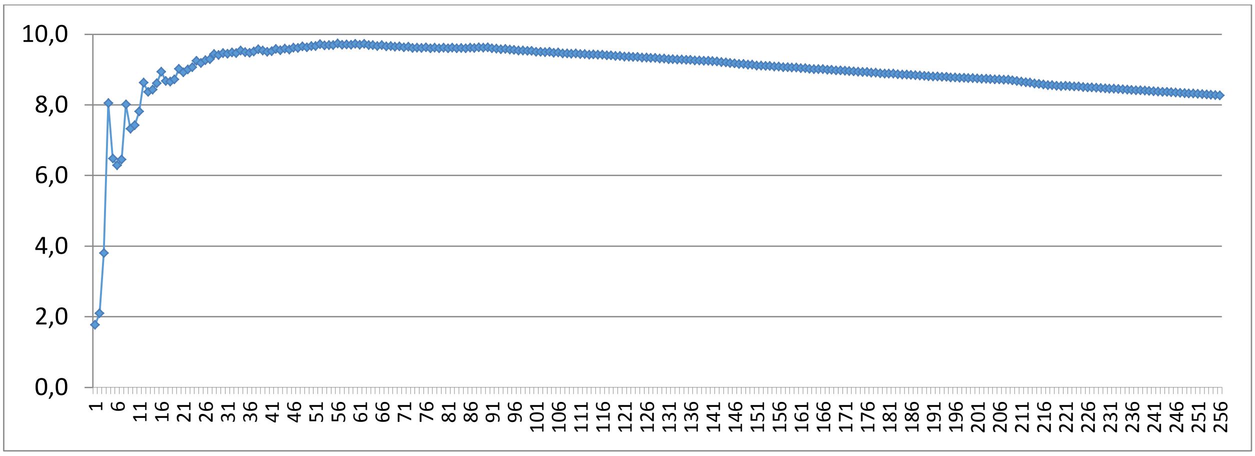


Fig. 4_15. The mass (L) of the broken mu-neutrinos and quarks d by one nucleon (MeV)

Now we plot the mass (Y) that has flown from the isotope (e-antineutrinos, gamma quanta and free gluons) by one nucleon (the sum of graphs 7 and 8, Table 5), see Fig. 4_16.

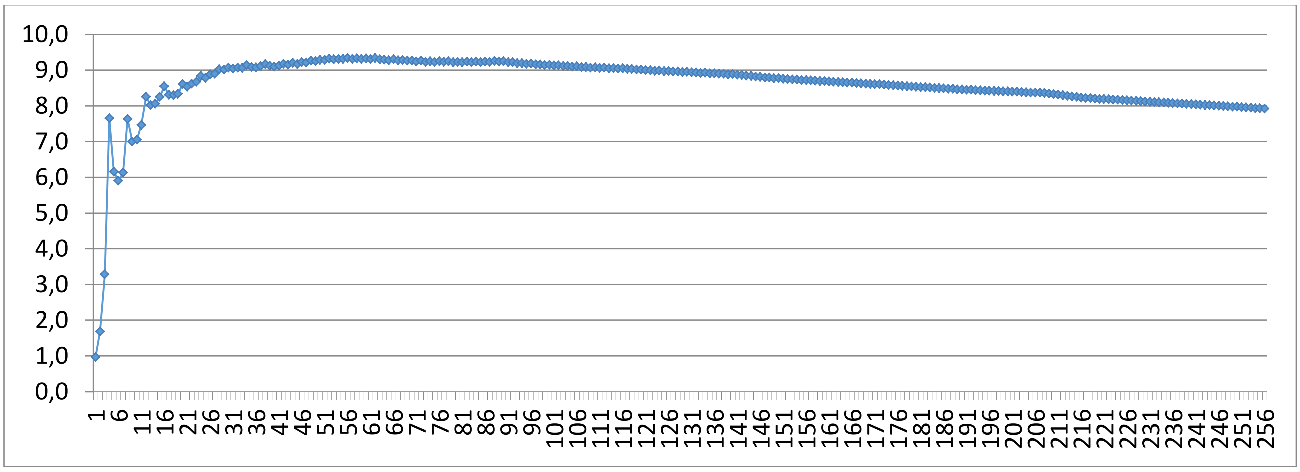


Fig. 4_16. The mass (Y) that has flown out of the nucleus by one nucleon (MeV).

As you can see the graph of mass (Y) passes slightly below the mass graph (L), but both of them retain the form of the graph of the binding energy.

We pass to the components that have flown away from the isotope.

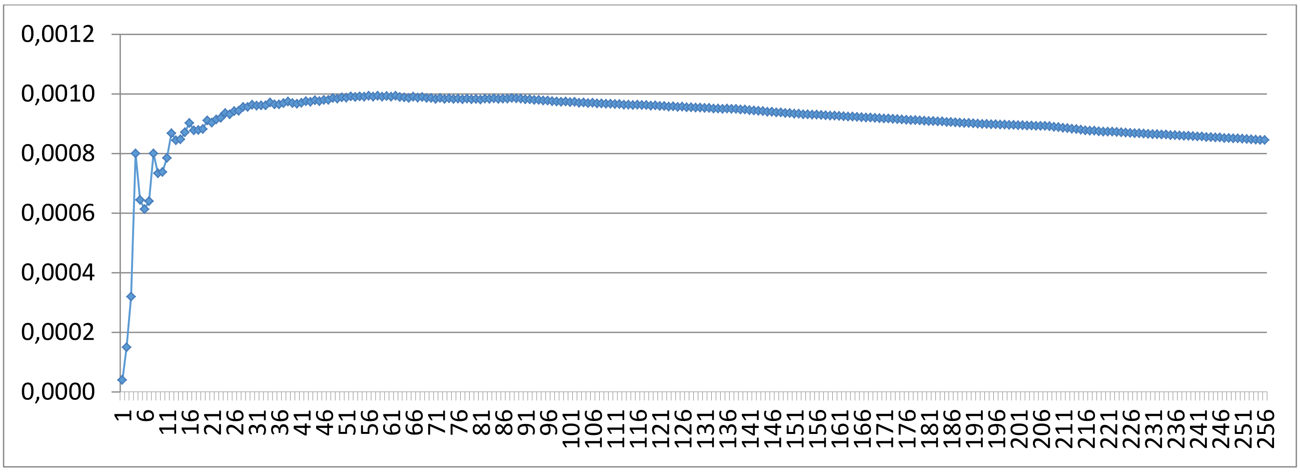


Fig. 4_17. The mass of e-antineutrinos per one nucleon (MeV).

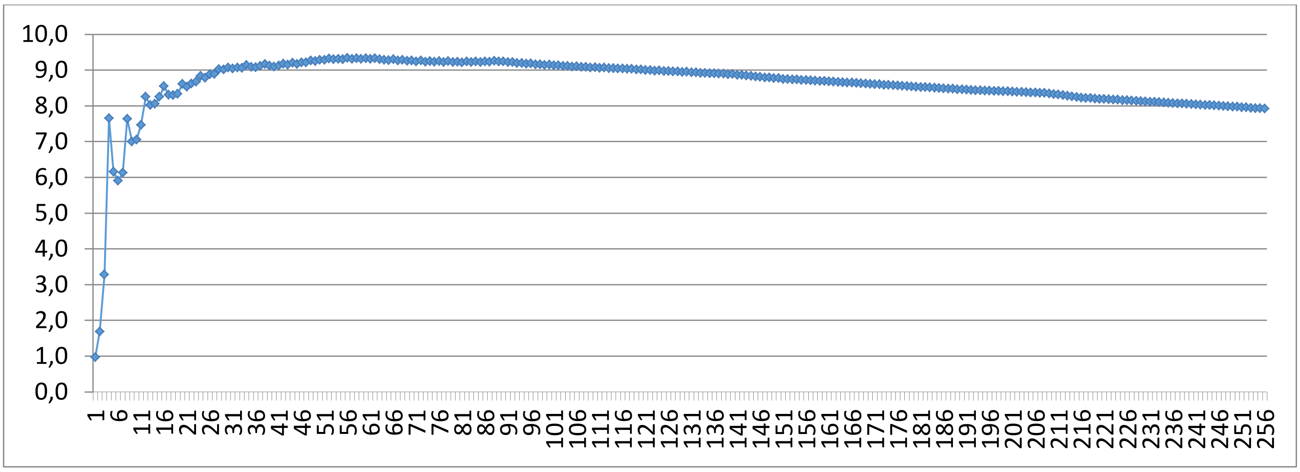


Fig. 4_18. The mass of gamma quanta and free gluons per one nucleon (MeV).

As you can see, these graphs also completely correlate with the graph of the Nucleon binding energy in the isotope. Yes, this is not surprising, many physicists believe that the binding energy of elements in composite nuclear objects is equal to the energy that is released during the reaction of the connectionsof these elements into a nuclear object.

From the point of view of S_theory, slit magnets, bursting mu-neutrinos (holes), and flagellums from gluon_SIF are elements of a physical model (mechanism) that provides compression of nucleons among themselves. A electron_antineutrino, gamma quanta and free gluons are, as it were, the result of "squeezing out" the excess mass (mass defect) when the nucleons are combined (compressed) into a single nucleus.

It should be noted that the last graph also applies to the mass (energy) of the departed gamma quanta and to the mass (energy) of free gluons. It is not yet possible to separate them strictly mathematically. we do not know exactly the spectrum of the gamma-ray frequencies, nor the proportion in which the formed gluons are divided into gluons_SIF and free gluons. If this proportion, in the "first approximation" is taken equal to 50 to 50 (%), then the mass (energy) of free gluons will be equal to the mass (energy) of gluons_SIF. The fraction of the mass (energy) of free gluons in this case is ~ 1% of the mass (energy) of gamma quanta (see Table 5). Taking into account the insignificant component of the free gluons, the graph in Fig. 4_18 can be considered a graph of the mass (energy) of gamma quanta per one nucleon.

For the "diversity" of the forms of graphs, we plot the mass of quarks and electrons per nucleon, see Fig. 4_19 and Fig. 4_20.

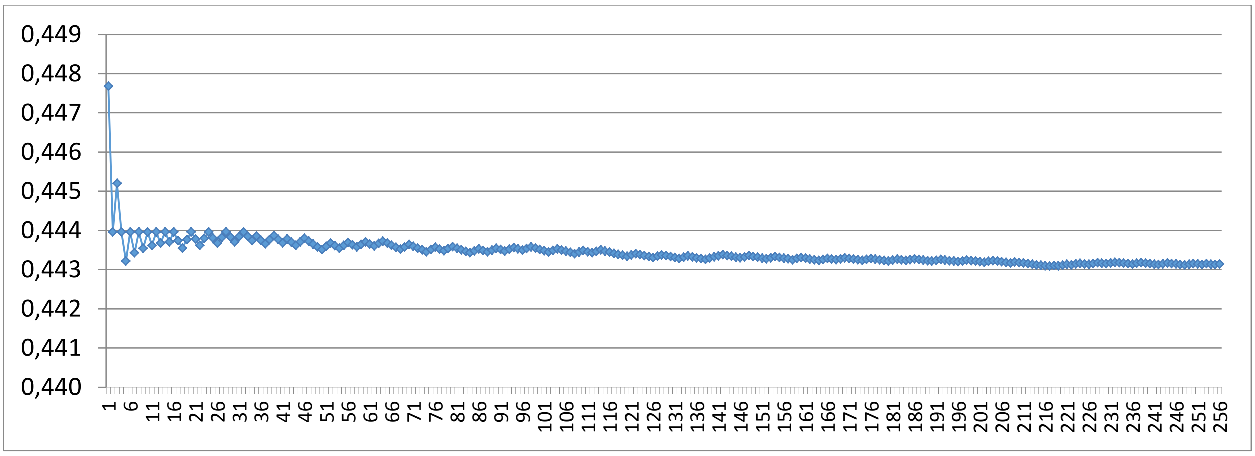


Fig. 4_19. The mass of quarks per one nucleon (MeV).

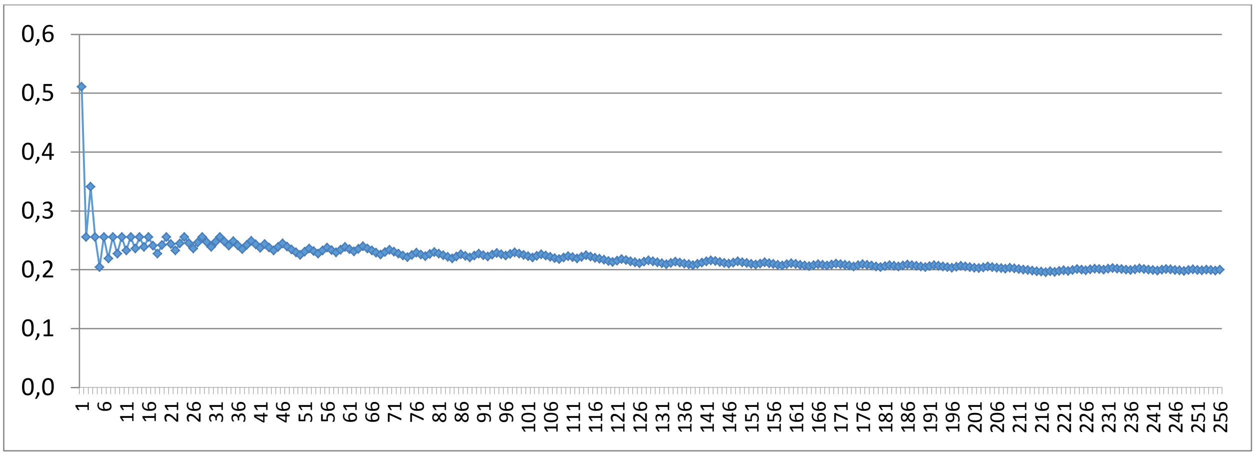


Fig. 4_20. The mass of electrons per nucleon (MeV).

As you can see, the graphs of the mass of quarks and electrons per nucleon are completely different from the graph of energy of the binding energy, which indicates their non-involvement in the forces of strong interaction. Between by yourself, they have an unconditional correlation, which is quite natural from the point of view of the balance of positive and negative charges.

The distribution of the mass of the bursting simples on the resulting components. The energy result of the reactions of nr_nucleosynthesis

To analyze the distribution of the mass of the broken simples, we construct the schedules of the share participation of the components presented in Table. 4 and 5, in the mass flow rate of the broken symbols (L).

The fraction of the mass (energy) of the bursting simples remaining in the isotope is accounted for by the newly formed quarks, gluons-SIF, and electrons (see Figs. 4_21, 4_22, 4_23).

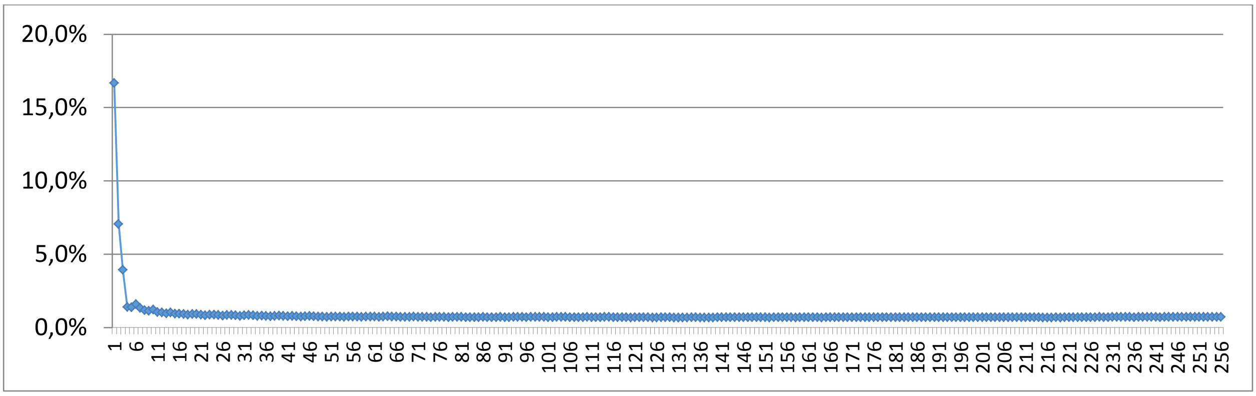


Fig. 4_21. The fraction (%) of the mass of newly formed quarks from the mass (L)

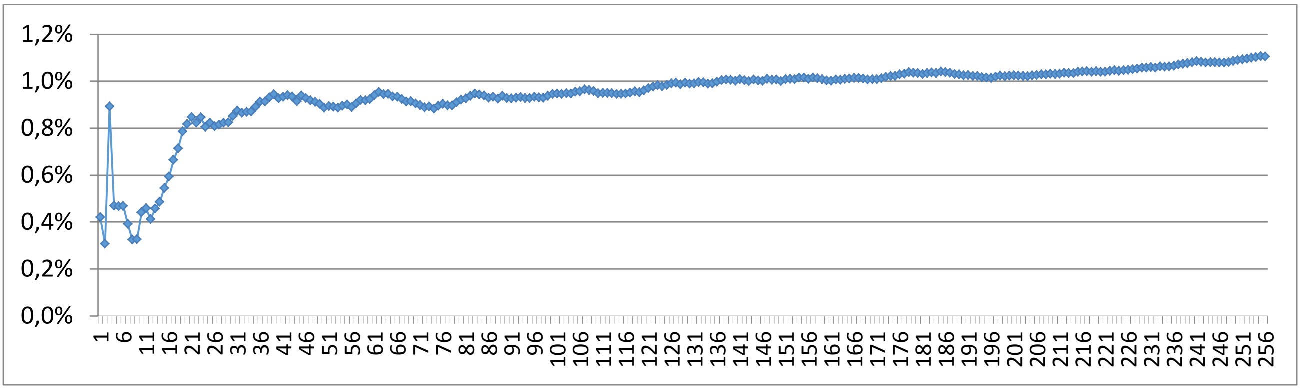


Fig. 4_22. The fraction (%) of the mass of gluons-SIF from the mass (L)

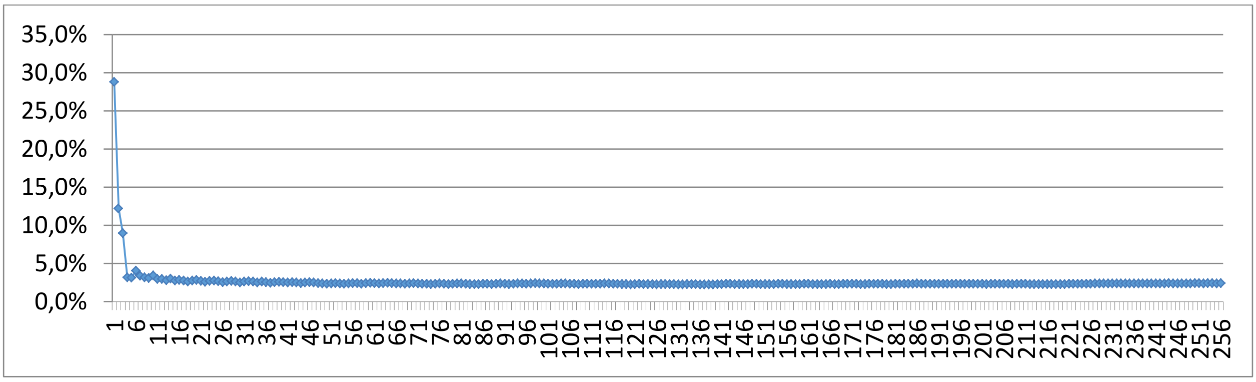


Fig. 4_23. The fraction (%) of the mass of electrons from the mass (L)

Now we plot the fraction of the Y-mass (energy) that has flown from the isotope (e-antineutrinos, gamma quanta and free gluons) from the mass (L) - see Fig. 4_24.

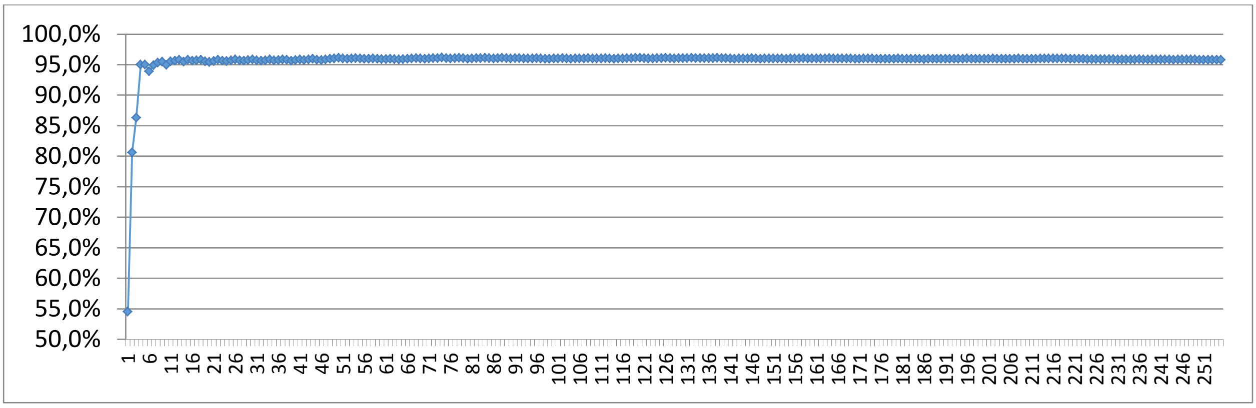


Fig. 4_24. The fraction (%) of the mass (Y) of the mass (L)

The sum of the data of the four graphs is 100% and completely reflects the distribution of the mass of the bursting simples. As we can see, the fraction of the mass of the bursting simples is ~ 96% of the mass that has flown out of the isotope (Y). The fraction of electrons accounts for ~ 2.5%, and the share of gluon-SIF and newly formed quarks (confinement) accounts for approximately 1% of the mass (L). These figures are very different., in the initial part of the graphs (of isotope spectrum), the values of these parameters are very differ. This is due, on the one hand, to the increased fraction of the mass of the first two electrons in the first three isotopes, on the other hand, to the great decrease in the graph of the mass of the gluon-SIF in the range from the 3rd to the 20th isotopes, due to the increased formation of through holes from the burst mu-neutrinos in this range of isotopes (the range of thermonuclear reactions).

Once again, we note that the mass balance (energy) of the flagellums VP, which keeps electrons in orbits around the nucleus, does not enter the mass balance of the bursted simples. Virtual photons, of which VP flagellums are built, are formed not from bursting simples, but from virtual photons of the surrounding space.

In one way or another, the mass of the bursting simples (mainly mu-neutrinos) passes in the mass (Y) that has left the isotope, which includes the mass of e-antineutrinos, gamma quanta, and free gluons. We construct the graphs of their fraction from the mass (A).

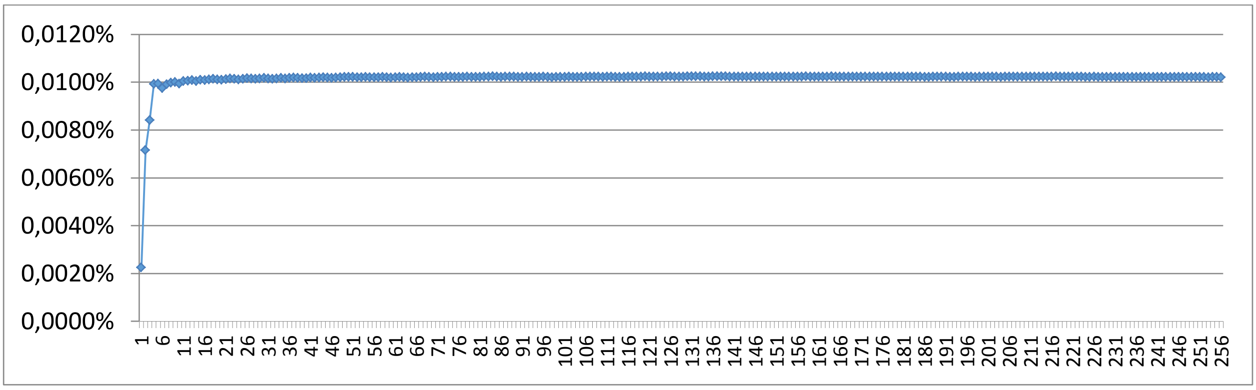


Fig. 4_25 The fraction (%) of the mass of the antineutrinos from the mass (L)

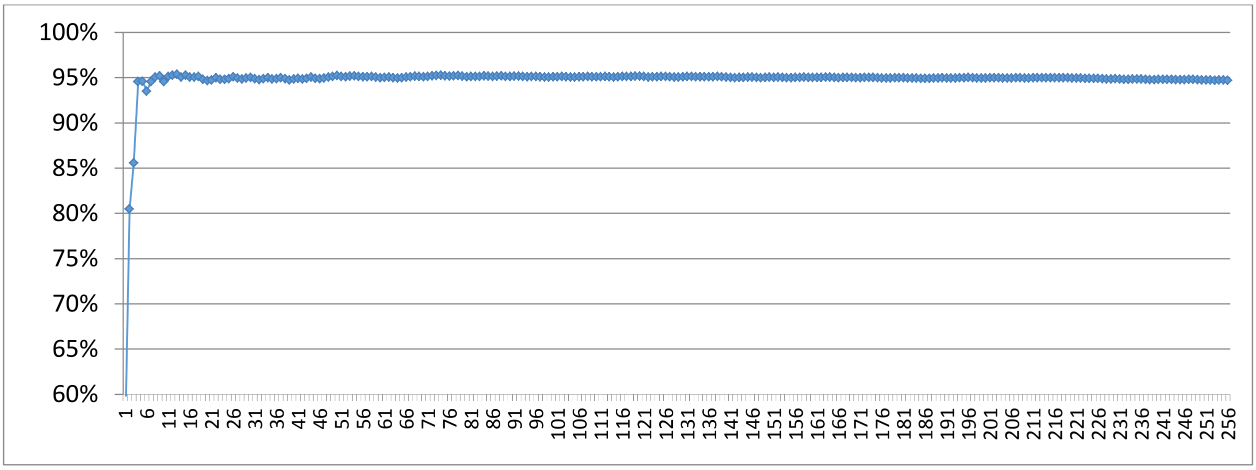


Fig. 4_26. The fraction (%) of the mass (energy) of gamma quanta from the mass (L)

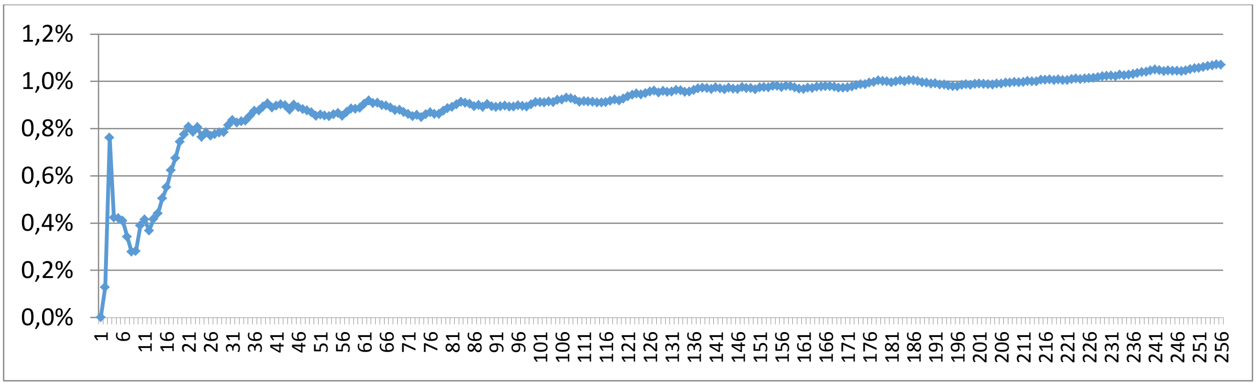


Fig. 4_27. The fraction (%) of the mass of free gluons
(= mass of gluons_SIF) from the mass (L)

As we can see, "the mass (energy) of gamma quanta, which is ~ 95% of the mass (L). This conclusion is to a certain extent conditional. The matter is that into the energy of gamma quanta we also include the kinetic energy of all the particles and nuclei formed, and the excitation energy of the nucleus and electrons (according to the S-theory, the precession of the symbols), etc. The question of the transition of gamma-quantum energy to these types of energy is not given in this the article. We limited to just one example - high-energy gamma quanta departing from the isotope excites its electron shell, which after some time passes into a normal state, emitting a secondary photon. The electron itself passes to a higher orbit.

Let us now analyze what is the energy result of the reactions of nr_nucleosynthesis.

In the SM, the formula for the energy result of nuclear reactions is the formula for the difference in mass (in MeV) before and after the reaction. However, in the analysis of many nuclear reactions, the experimental values of the released energy are given, which differ from the classical formula, as a rule, in a smaller direction.

S_theory to some extent explains this dilemma. Simply, we probably still do not know how to accurately measure the amount and energy of the particles formed, which are simples of the second kind (e-antineutrinos, gamma quanta and free gluons). As a result, a secondary "mass defect" arises at the level of "lost energy".

Our work does not solve this dilemma "technically", so we propose, as a potential energy result of all nuclear reactions, to consider, as a first approximation, the mass (energy) of the bursting mu-neutrinos.

Conclusion of the 4th chapter

The developed S-models of nucleons and their structural S-components (slit magnets, bursting mu-neutrinos, holes formed and a bunch of gluons), as well as the S-models of the formation of electron-antineutrinos and gamma quanta, allow us to build a model of the electro-magnetic mechanism for the realization of strong nucleon interaction forces in the nucleus. The proposed mechanism makes it possible to simulate the process of nr-nucleosynthesis of the spectrum of all isotopes in a single cycle. Calculation of this process using the example of a sequence of stable isotopes (main-stream) allows the graphs of the change in the amount (mass, energy) of the S-components of nucleons and decay products of simples in the process of nr_nucleosynthesis. The obtained results (graphs) coincide well with known theoretical and experimental data; in particular, they correlate well with the known graph of the binding energy of nucleons in isotope nuclei.

Chapter 5. Analysis of the internal structure and shape of the nuclei

As already noted, the ST_Cosmological model of primary nr_nucleosynthesis of the spectrum of isotope nuclei assumes a sequential assembly of nucleons having a toroidal form into a single "sausage" of nucleons (see Fig. 2-6).

The image of "sausage" came to our mind first, although, given that inside the toroidal aggregates of nucleons there is an aperture (0.022 fm), the assembly of nucleons into the nucleus can be compared with the assembly of beads from bagels. That's just no physical thread, on which stringed beads of nucleons, does not exist. Nucleons gather into the core with the help of magnetic forces, like a garland of flat magnets.

The proposed model of nuclei in the form of "sausage" requires a numerical analysis. If we recall that the thickness of the torus of the nucleon is 0.4274 fm, and its diameter is 0.8768 fm, which corresponds approximately to 1 to 2, then the fermium nucleus of 256 nucleons will be a "sausage" or "beads" of length 256 units and a diameter of 2 units.

To imagine a nucleus with a ratio of length and diameter of 128 to 1 is very problematic, although it is known that the nuclei of heavy elements are spindle-shaped (but not to the same extent).

This chapter is devoted to a detailed analysis of the internal structure and shape of the nuclei. As already noted, the physical "mechanism" for assembling nucleons into nuclei is the process of attraction of slotted magnets (three in each nucleon). The force of attraction of the slit magnets depends on the number of mu-neutrinos that burst in them and the "holes" formed in their place. To model the shape of the nuclei, it is necessary to analyze this process in detail.

We will be repeling from number of burst mu-neutrinos at each step of nr_nucleosynthesis. When analyzing the physical model of SIF, we already plotted the dependence of the average number of burst mu-neutrinos by one nucleon on the number of nucleons in the isotope core (Fig. 4-8) and was convinced of its correlation with the graph of nucleon binding energy in isotope nuclei.

We also gave a graph of the number of burst mu-neutrinos at each step of nr_nucleosynthesis (grap 8 of Table 1), let's carefully study it again (see Fig. 5_1). We remind you that the graph refers to a number of stable isotopes main strem.

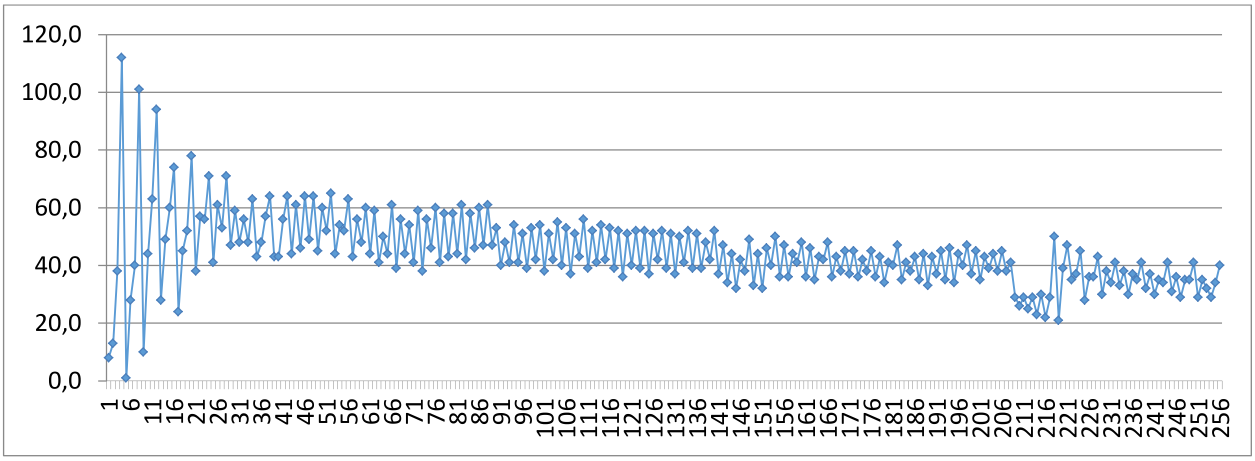


Fig. 5_1. The number of burst mu-neutrinos at each step of nr_nucleosynthesis.

As we can see, there are some regularities (a certain asynchronous periodicity with period equal to 4 nucleons, which is more pronounced at the beginning of the graph from the 1st to the 32nd isotope (32S) or from the 1st to 32 th nucleon). Let's try to understand - what is this periodicity and what does it mean.

An additional complication for the analysis of the obtained data is that, from the calculation of the mass defect, we know only the total number of mu-neutrinos that burst at each step of nr_nucleosynthesis when following relic neutron is added. But how this number of mu-neutrino bursts has distributed at the nucleons of the nucleus is distributed is not known.

The assumption that all the mu neutrinos are bursting in the newly joining nucleon does not pass; at some steps the number of mu-neutrinos bursts more than 61 pcs. i.e, more than originally contained in a relic neutrino. This means that when a new relic neutron is added, the mu-neutrinos burst not only in it, but also in the nucleons that were built into the nucleus earlier.

However, there is nothing surprising in this - when a new nucleon is added new holes are formed in the slit magnets, the compression force of the nucleus increases, it presses, incl. and the old nucleons, their deformation increases and a part of the mu-neutrino are bursts in them.

It is interesting that according to Table 4 and graph 5_1, the maximum number of mu-neutrinos bursts precisely when each fourth nucleon is attached. At least this is absolutely true for the first 7 quartets of nucleons. What is the reason for this?

At first glance, it can be assumed that this is due to the transformation of the relic neutron into a proton. In fact, this explanation is 100% triggered in the range from the 2nd to the 7th quartet of the isotopes of the table of main stream table (or from the 5th to the 32nd nucleon of the nucleus). However, in the first quartet, the maximum number of bursting mu neutrinos (112 pieces) falls on the fourth nucleon, but it is a neutron (formation of the isotope 4He from 3He). After the 7th Quartet, most of the fourth joined nucleons (by main strem) are also neutrons.

Of course, we can assume that the main stream is composed incorrectly and it is necessary to "slightly adjust" it so that every fourth nucleon becomes a proton. But objectively this can not be done, and the very assumption that when the relic neutron is converted into a proton, the maximum amount of mu-neutrinos bursts, even in the range from the 2nd to the 7th four (with 100% result) is justly only for every second proton . But in a half of the protons, mu-neutrinos burst in the same amount as in neutrons, and even less.

For additional analysis of the "quartets" pattern of mu-neutrino bursting,

we calculated the number of bursting mu neutrinos in every quartet, below this graph is presented (column 13 of Table 1):

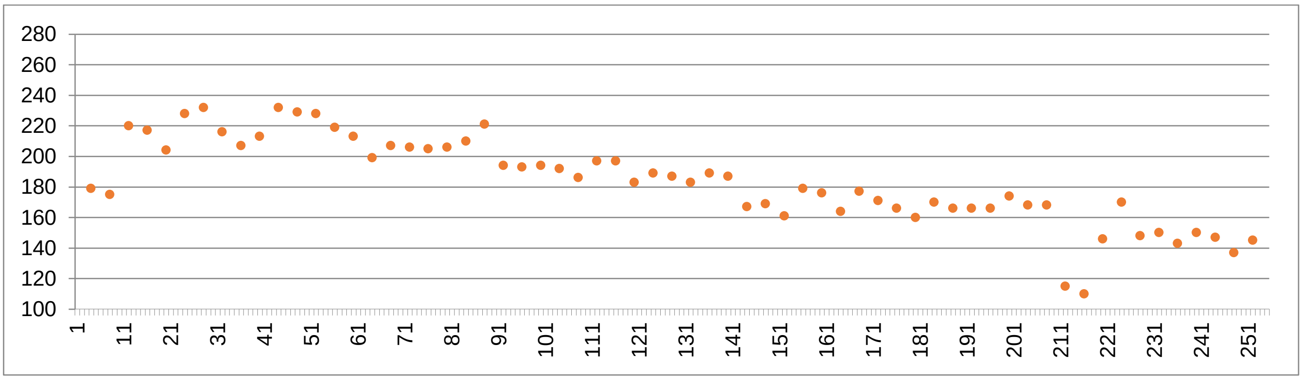


Fig. 5_2. The number of burst mu-neutrinos in every quartet of the nucleons.

The graph reflects some "broken" sinusoidal regularity of the number of bursting mu-neutrinos in every quartet, but it does not give an unambiguous answer to the question posed.

To further search for the cause of the maximum number of mu-neutrinos bursting in every fourth nucleon, we will try to simulate the process of attraction of slit magnets to each other and deformation of the toroidal shape of the nucleons in this case.

S_modeling of the process of nr_nucleosynthesis and the shape of the first eight isotopes

In the previous section of this chapter, we disassembled the "mechanism" of the process of combining nucleons into isotope nuclei by means of slot magnets in general form without binding to specific isotopes.

Let's try to model this process geometrically (topologically) on the example of the first eight isotopes.

The first isotope is the hydrogen isotope 1H. Its shape is shown in Fig. 5_3. It consists of one nucleon (proton) formed during the decay of the relic neutron, and the force of attraction of the nucleons does not change him shape.

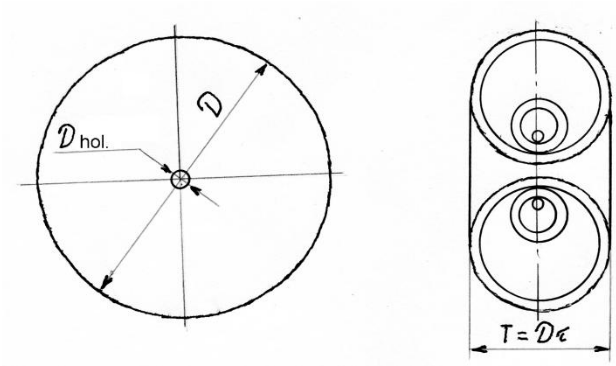


Fig. 5_3. The shape of the nucleus of the isotope 1H from the 1 nucleon

The values of the parameters in the figure according to S_theory:

D nucleon = 0.8768 fm

Dotv = 0.022 fm

Dτ = 0.4274 fm

Lτ (external) = πDτ = 1,3427 fm

Dμ = 9.7 fm

d = 0.00059 fm

T = 0.4247 fm

The values of the parameters are rounded, the calculations we carried out below are estimated.

Union of two nucleons (formation of the deuterium nucleus).

Union of reference proton and of relic neutron. We know their dimensions, but we do not know the exact values of the attractive forces of slit magnets and the elasticity coefficients of nucleons donuts. Therefore, the modeling of the process of attraction of nucleons and the deformation of their shape will be carried out mainly at the geometric level, based from the conservation of the length of the tau-neutrinos, and assuming the inner radius of the mu-neutrino torus to be equal to the critical radius of the inflection of the simples, ie, not subject to deformation (with a stronger bend they burst).

The force of attraction of nucleons is applied in the region of their slit magnets. Here it should be noted that our two nucleons, initially, contain within themselves a different number of mu-neutrinos (pref) 53 pcs and (nr) 61 pcs. This means that their rigidity initially also will be different, the proton has less, the neutron has more. As a result of a donut tau-neutrinos of a proton will be deformed more than of a neutron. As a result, more mu neutrinos (12 pcs.) burst in the proton, and less in the neutron (only 1 pc.). As a result of different deformations, the contact surface of the nucleons becomes a cone, as shown in Fig. 5_4. Forces of elastic repulsion of nucleons are distributed along the surface of a given cone.

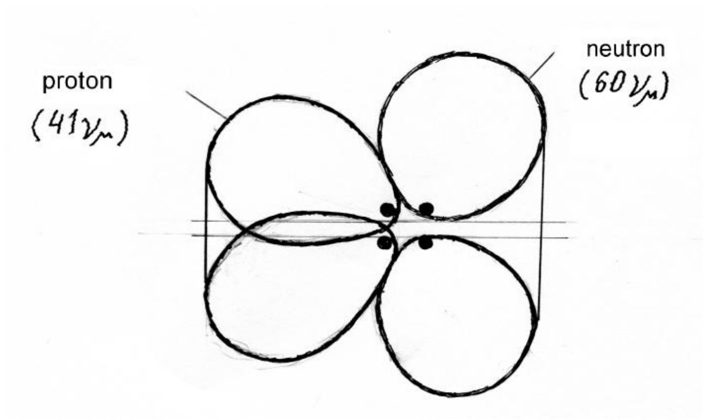


Fig. 5_4. Asymmetry of proton and neutron deformation in deuterium nucleus
(mu-neutrinos are not shown conditionally)

The more "soft" toroidal aggregates of protons are deformed more, so that the bagels of its tau-neutrinos partially overlap each other, as shown in the figure, but we'll talk about this later.

The angle of the cone into which the tau-neutrino donuts of the proton are retracts will be less than 90 °. The angle of the cone into which the tau-neutrino bagels of a neutron are retracts are different than 90 °.

Unfortunately, we do not know how far the cone angles are different from 90 degrees. If the rigidity (elasticity) of the nucleons is assumed to be proportional to the number of remaining mu-neutrinos in the nucleons, then the ratio of the cone angles is 73 ° to 107 °. The deviation from 90o is about 19%. Taking into account the relatively small size of the asymmetry of the shape of the nucleons, we will conduct further calculations of the dimensions of the nucleus for two identical 90 ° cones. For the estimated calculation, we consider this to be admissible, see Fig. 5_5.

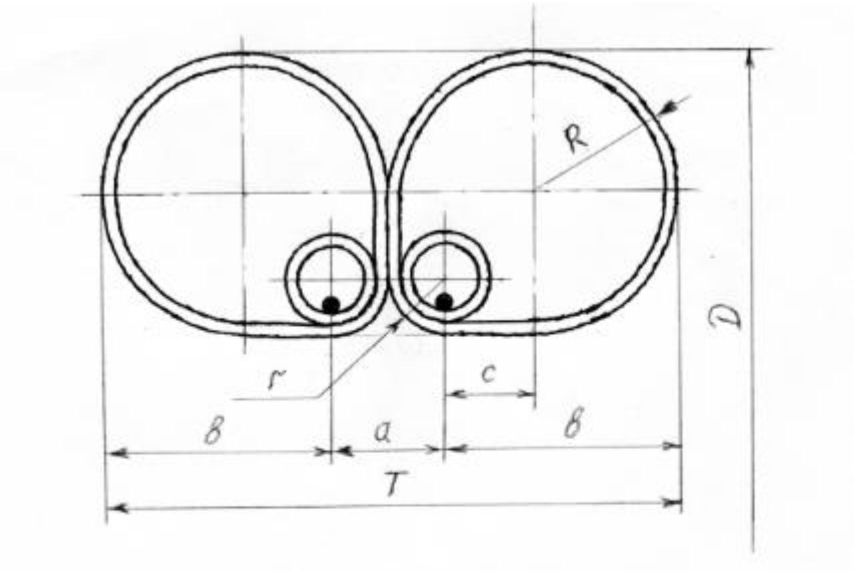


Fig. 5_5. The cross section of the nucleus of the isotope 2H from 2 nucleons
(for simplicity, only the halves of the nucleons are shown)

The key parameter of the result of the attraction of nucleons is the distance to which "quark hoops" attracted (parameter a). Considering that the mu-neutrino bagels can not shrink (deform) practically (they have a critical bending radius, the transition through which leads to their cracking and bursting), the parameter a will be equal to the outer diameter of the mu-neutrino plus 2d from the two simples of the two tau-neutrinos :

a = Dμ + 2d = 9, 7d + 2d = 11.7 (d) = 0.0069 (fm)

We calculate the remaining dimensions of the deuterium nucleus (skipping the derivation of some formulas):

$r = a / 2 = 0.00345$ (fm)

$R = (2L\tau + r (4 - \pi)) / (3\pi + 4) = 0{,}2003$ (fm), where $L\tau = L\tau$ (external) is the length of the external circle tau-simple

$c = R\text{-}r = 0.1968$ (fm)

$b = c + R = 0.3971$ (fm)

$T = a + 2b = 0.8011$ (fm)

$D = 4R + Dotv = 0.823$ (fm), where Dotv is the diameter of the hole in the bagels of nucleons (0.022 fm)

As we see, due to the contraction of tau-neutrino bagels to the center of the nucleus, the nucleus diameter slightly decreases (by 6.1%) in comparison with the free nucleon diameters, and becomes approximately 0.939D = 0.823 fm, where D nucleon is the nucleon diameter (0, 8768 fm).

The thickness of the deuterium nucleus (0.8011 fm) also turned out to be less than two nucleon thicknesses = 2 * 0.4247 = 0.8494 fm.

<u>"Attachment" to the nucleus of deuterium of the third relic neutron</u>

Before joining the deuterium nucleus to the third relic neutron, we need to determine beforehand which nucleon will be joined by a new relic neutron (?).

Once again looking at the shape of the deuterium nucleus (Fig. 5_4), we can see that the parameter b on the side of the proton is actually larger (due to its greater deformation), while the neutron has less. This is a very important circumstance, it means that the magnitude of the forces of strong interaction from the slit magnets at the outer boundary of the proton will be less than at the outer boundary of the neutron. And this means that the addition of the next relic neutron, other things being equal, will most likely occur from the side of the neutron, not the proton.

In addition, elongated bagels of tau-neutrinos of the proton, pressed to the axis of the nucleus, can start to overlap each other and close the channels for the exit of flagellums of gluons_SIF outward from the nucleus. This will also prevent the addition of the next relic neutron from the side of the proton. It turns out that the further growth of the nucleus is most likely will go from the side of the neutron, and this will lead to an even greater retraction of the hoop of quarks (slit magnets) of the proton toward the center of the nucleus. As a result, the solid angle of the proton will decrease more and more, and the tau-neutrino bagels will more and more to close "berth" of the nucleus from the side of the proton.

Both of these circumstances ultimately lead to a one-sided growth of all isotope nuclei. An additional indirect confirmation of this is the α-decay reactions of a large number of heavy isotopes, which, from the point of view of S-theory, are predetermined precisely by the formation of α-particles at the very beginning of the "sausage" of the nucleus. If the growth of the nucleus were two-sided, the formation of α particles at the ends of the "sausage" of the nucleus would be a probabilistic process. And for heavy elements, whose growth is mainly due to neutrons, the probability of forming α particles at the ends of the "sausage" of the nucleus would be practically zero.

Having determined the direction of the growth of the nuclei, it is possible to proceed with the addition of a third relic neutron.

The shape of a nucleus of three nucleons becomes as shown in Fig. 5_6. The "quark hoop" of the third nucleon is pulled to "quark hoops" of the first two nucleons, as a result of the tau-neutrinos of all three nucleons they are even more compressed and drawn into cones with angles equal to approximately 60 °.

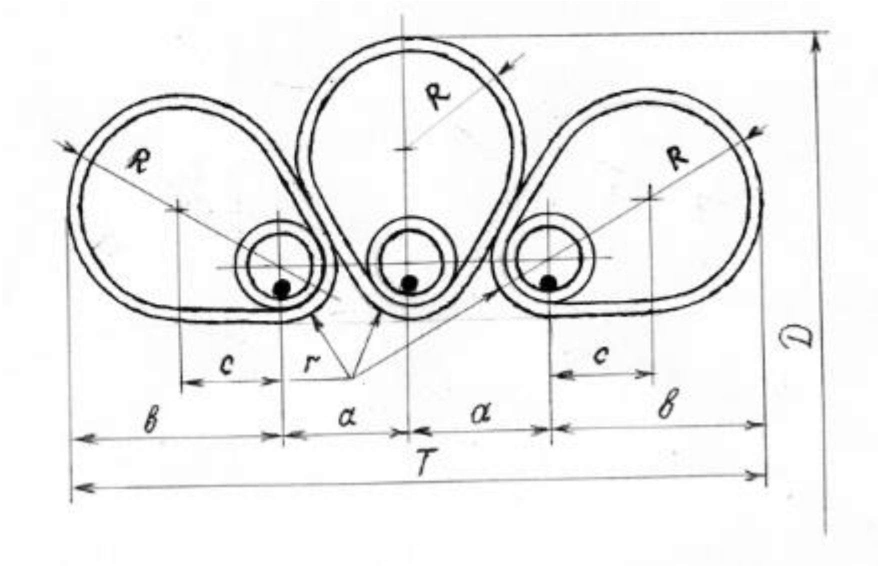


Fig. 5_6. The cross section of the nucleus of an isotope of 3 nucleons
(for simplicity, only the halves of the nucleons are shown)

We calculate the size of the resulting nucleus from three nucleons (skipping the derivation of the formulas):

r = 0.00345 (fm)

R = 0.1466 (fm)

c = 0.2791 (fm)

b = 0.4436 (fm)

a = 0.008 (fm)

d = 0.4516 (fm)

T = 0.9032 (fm)

D = 1.0024 (fm)

When performing these calculations, we did not take into account the asymmetry of the initial deuterium nucleus and the asymmetry with the mu-neutrino burst during the addition of the third nucleon.

Note:

Unfortunately, we can not say what isotope we have obtained and how many mu-neutrinos have further burst in each nucleon. Everything depends on the "circumstances" of the given process, as a result we have either an isotope of tritium or an isotope of helium-3.

The nucleus of an isotope from four nucleons

The result of joining the fourth nucleon is shown in Fig. 5_7. The angle of retraction of tau-neutrino bagels and mu-neutrinos is approximately 45 ° (α = 45 °).

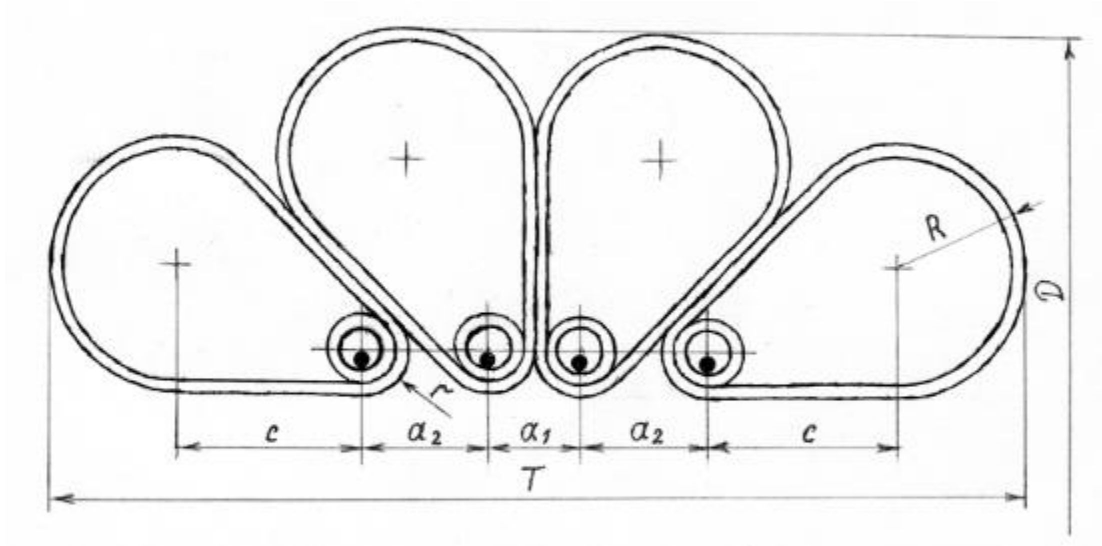


Fig. 5_7. The cross section of the nucleus of an isotope from 4 nucleons
(for simplicity, only the halves of the nucleons are shown)

We calculate the size of the resulting nucleus from four nucleons (skipping the derivation of the formulas):

r = 0.00345 (fm)

R = 0.1543 (fm)

T = LN = 1.0637 (fm)

D = 1.0421 (fm)

Taking into account that the parameter T (the thickness of the nucleus) becomes larger than its diameter (D), we change the designation of the parameter T to the designation LN - the length of the nucleus.

When carrying out these calculations, we did not take into account the asymmetry of the number of bursted mu-neutrinos in nucleons.

Note: The core of the helium-4 isotope was formed. For clarity, we give its form completely, without detailing the individual neutrinos and simples, see Fig. 5_8.

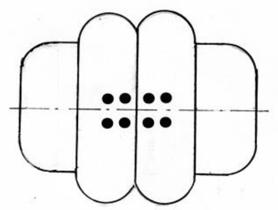


Fig. 5_8. The nucleus of the isotope 4He (α-particle)

The nucleus of an isotope from five nucleons.

The degree of deformation of the four of the nucleons with the angles of retraction of the tau-neutrino bagels equal to 45 ° is probably the limiting. Further deformation of the nucleons tau-neutrino bagels, when trying to draw them into an angle less than 45 °, is not possible. Therefore, the next joining nucleon (the fifth) by the lines of force of its slit magnets reaches the region of the grouping of the slit magnets of the first four nucleons, builds the flagellum of gluons_SIF along them, but it turn out to be too long and "weak" and simply "hold" the fifth nucleon "on a leash", not deforming its shape. Almost all the mu-neutrinos in it remain intact, only one mu-neutrino bursted, forming one hole through which only one gluon flagellums "climbs". As a result, the picture of the connection of five nucleons to the nucleus of the atom will looks like, as shown in Fig. 5_9.

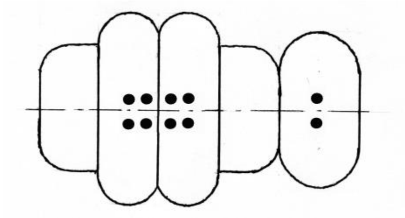


Fig. 5_9. Form of nucleus of isotope from 5 nucleons

This circumstance leads to the fact that the fifth nucleon (5He) is unstable, it "hangs" in the nucleus, as if "on an honest word" due to only one flagellum of gluons. If the relict neutrons at this stage of nr_nucleosynthesis have ended, then the isotope No. 5 (5He) would necessarily disintegrate, and the entire spectrum of primary isotopes would be limited to four types of isotopes: No. 1, No. 2, No. 3, No. 4. But, fortunately, there are still many relict neutrons, and the process of primary nr_nucleosynthesis continues.

<u>The nucleus of an isotope from six nucleons.</u>

The sixth nucleon "corrects" the instability problem of the fifth isotope, its the "quark hoop" is attracted to the "quark hoop" of the fifth nucleon, similar to the addition of the second nucleon to the first, their deformation occurs, and the process of mu-neutrino bursting resumes with a "new force". In slit magnets of the fifth and sixth nucleons, holes are formed (approximately 28 pieces), accordingly, the attraction forces and the number of flagellums of gluons increase between the first four nucleons and the newly formed two nucleons, they tighten the four and two nucleons more closely to one another, a stable isotope is formed from six nucleons, see Fig. 5_10.

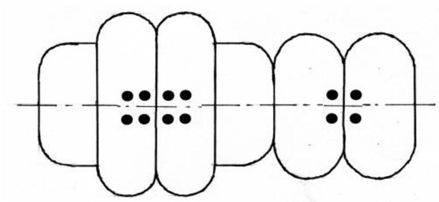


Fig. 5_10. Form of the nucleus of an isotope from 6 nucleons

The process of nr_nucleosynthesis returns to the generation of stable isotopes. The formed pair of the fifth and sixth nucleons is the basis for constructing the second four of the nucleons.

<u>The nucleus of an isotope of seven nucleons.</u>

The process continues. The seventh nucleon joins from the two of the fifth and sixth nucleons, turning them into a triplet (60o each). The number of bursting mu-neutrinos increases, the attraction forces of nucleons in the triplet increase. Also, the forces of attraction of the four and three are increasing, according to their attraction to each other. Hoops of quarks of nucleons, to which "slotted magnets" are attached, are assembled into two groups, the distance between which is approximately half the length of the nucleus. On this segment on the outer surface of the "sausage" of the nucleus a peculiar "constriction" is formed, as in "sausages," see Fig. 5_11.

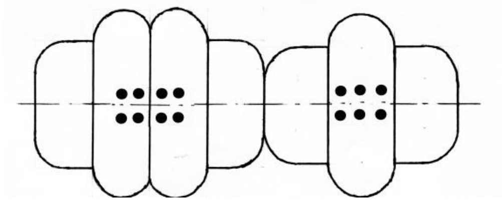


Fig. 5_11. Form of the nucleus of the isotope from 7 nucleons

<u>The nucleus of an isotope of eight nucleons.</u>

The eighth relic neutron completes the formation of the second four. In Fig. 5_12 shows the result of assembling eight nucleons into the nucleus of the isotope.

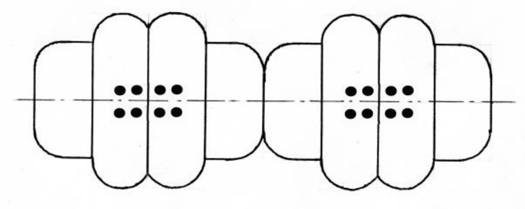


Fig. 5_12. Form of the core of an isotope from 8 nucleons

We got as it were two "beads" connected together, each of which consists of four nucleons, and between "beads" there was a "constriction", as on "sausages". If we assume that at the "waist" site the extreme nucleons quartets (the fourth and fifth nucleons) were additionally pressed against each other by approximately R (0.1553 fm), i.e. each of the tau neutrinos is additionally "flattened" by half the radius R, then the total length of such a nucleus, consisting of two "beads" of quartets nucleons, will be approximately 1.973 fm.

Taking into account that with further growth of nuclei, the extreme nucleons of all "beads" of four nucleons will also be pinched by neighboring "beads", then the "averaged" length of "beads" of four nucleons can be considered equal to:

Averaged the size of bead from 4 nucleons = 1.973 - 0.1543 / 2 = 0.9093 fm.

Further construction of isotope nuclei proceeds approximately by the same algorithm. As a result, the formed nuclei of isotopes resemble not the loaf of sausage (as shown in the original scheme of nr_nucleosynthesis, (see Figure 4_1), but on the chain of "sausages" with banners, see Fig. 5_13.

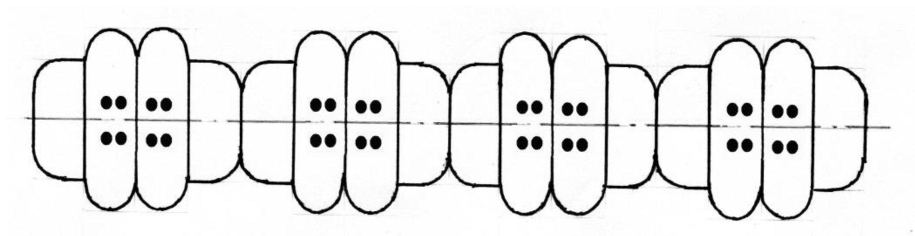


Fig. 5_13. Form of the nucleus of the isotope from 16 nucleons

<u>α-particle</u>

It should be noted that the first pronounced "bead" in all nuclei of isotopes is 4He nucleus (α-particle) and that it is always connected to the rest of the nucleus through a constriction. This reduces the strength of its connection with the rest of the nucleus, which leads to the fact that 4He (α-particle) nuclei very often emerge as fragments of nuclei in numerous nuclear reactions. Similarly, all other decays of isotope nuclei should, most of the time, take place at sites of constrictions between the fours of nucleons.

To test this conclusion, let us analyze the results of some nuclear reactions of the splitting of the nuclei (atoms) of isotopes. In accordance with the atomic nucleus represented by the S-model, all splittings must occur at the constriction points, i.e. between "beads" consisting of four nucleons.

Our cursory analysis of the decay of 235U92 showed that in most reactions of spontaneous decay this rule is observed (a fragment multiple of four nucleons is underlined):

235U → 231Th + <u>4He</u>

235U → 215Pb + <u>20Ne</u>

235U → 207Hg80 + <u>28Mg</u>

In the forced decay reactions of 235U92, are formed nuclei containing on one nucleon are smaller than the required number of nucleons, a multiple of four. However, in addition, free neutrons are formed additionally, which are the missing detached nucleons, for example:

235U + n → <u>139Ba</u> + 95Kr6 + 2n

It turns out that the impact of a neutron on the nucleus of the 235U92 atom broke the nucleus into two fragments between the 140th and 141n nucleons, which corresponds to the location of the constriction, but the blow was so strong that it tore off another neutron from the first fragment, resulting in fragments , containing 139 and 95 nucleons.

However, there are reactions in which this rule is not observed, for example, the spontaneous decay reaction:

235U → 210Pb + 25Ne

Without being a specialists in these reactions, we are not going to judge the reasons for these deviations, maybe this is the result of passing the composite nuclear reactions (for example, in conjunction with the β-decay).

The fact of the frequent appearance of α-particles in the products of nuclear reactions can be used to verify the validity of S_theory. For this, the α-particles must be their mass is determined compared to the mass of the nucleus of the 4He isotope (primary α particle).

Variable mass of α-particles

According to S_theory, the mass of the α-particles emitted from different isotopes should be different. So the reference mass of the primary α-particle (4He nucleus) is:

α (4He) = m(4He) - 2e- - VP(4He) = 3728.40115978 - 2 * 0.51099891 - 0.00003819 = 3727.37912377 MeV

According to our calculations in Chapter 4, the number of mu-neutrinos remaining in it is 73 pieces, i.e. 18.3 pcs. on one nucleon in the mean.

But the mass of α-particles in the 56Fe isotopes should be smaller, since The number of the remaining mu-neutrinos in each nucleon in this isotope is 9 pcs, and in four nucleons of the α-particle it will amount to 36 pcs. Correspondingly, the mass of α-particle in a given isotope should equal:

α(56Fe) = α(4He) - (73-36) * νμ = 3727.37912377 - 37 * 0.18582935 = 3720.50343782 MeV

But this is not the final calculation of the mass α-particle (56Fe). We know that other particles form from the bursting mu-neutrinos, some of which remain in the nucleus, these are quarks and gluons. The mass of quarks in all α-particles is the same, which can not be said for gluons_SIF. In the process of increasing the number of nucleons, more and more mu-neutrinos burst in the nucleus, while in their place more and more new flagellums of gluons_SIF are formed, their total mass (energy) is constantly increasing, which we have not yet taken into account in our calculations.

In the previous chapter, we calculated that in the core of the 4He isotope, the total mass (energy) of the gluons_SIF is 0.13623192 MeV, and in the core of the 56Fe isotope, the total mass (energy) of the gluons_SIF is 4.649841126 MeV, i.e. at 4.513609206 MeV more. But this difference in mass (energy) of gluons_SIF falls on the flagellums, piercing all the nucleons 56Fe. We are only interested in the mass (energy) of the flagellumstes of the gluons_SIF in the first 4 nucleons related to the α-particle of the 56Fe isotope.

Taking into account that the same number of mu-neutrinos (9 pieces) remained in all nucleons of the 56Fe isotope and the same number of mu-neutrinos (52 pieces each) bursted , forming 52 through holes for the gluons_SIF globules, we can take the distribution of gluons_SIF uniformly for all nucleons, and hence for the "beads" of four nucleons. Such "beads" in the isotope 56Fe 14 pcs. Accordingly, 4.513609206 / 14 = 0.332131509 MeV gluons_SIF correspond to one "bead" of the 56Fe isotope, and the increment of the mass (energy) (56Fe) with respect to α-particle (4He) is 0.332131509 - 0.13623192 = 0.195899589 MeV.

Thus, the final mass of α-particle (56Fe), taking into account the increase in the mass of gluons_SIF, is:

α (56Fe) = 3720.50343782 + 0.195899589 = 3720.699337409 MeV

We draw your attention to the fact that calculating the mass of α-particle (56Fe), as 1/14 of the mass of the 56Fe isotope, would be incorrect, because it contains 26 protons and 30 neutrons, the mass of "quark hoops" in which differs.

Taking into account the fact that with further nr_nucleosynthesis of subsequent isotopes, the mu-neutrinos from incoming relic neutrons can not "jump" to previously attached nucleons, the mass of α-particles in heavier isotopes with the number of nucleons A> 56 should be the same as in the 56Fe isotope, i.e 3720.699337409 MeV, that at about 6.679786361 MeV is less than the mass of the reference α particle in the isotope 4He, which is 0.18%.

This difference in the masses of α particles in different isotopes can probably be established by a special experimental verification, which would serve as good arguments for the correctness of the S-theory.

The masses of α-particles calculated of us for the 4He and 56Fe isotopes will be needed in the 10th chapter for the S_analysis of the α-decay reactions.

The formula for calculating the length of nuclei

At this stage, for the obtained S_model of nuclei consisting of "beads" containing four nucleons, we can give the formula of approximate calculation of the length of the "sausage" of isotope nuclei:

L of the isotope nuclei = 0.9093 * A / 4 = 0.2273 * A (fm), where A is the count. nucleons in the nucleus of the isotope

The length calculated by this formula can not be considered the size of the isotope core, since, as we shall see later, the "sausages" of the isotope nuclei do not grow rectilinearly, but with fractures of the axis of their growth; gradually twisted into "bend" and "tangles".

The reason for the twisting of the isotope nuclei in the "bend" and "tangle" will be discussed separately.

Japanese physicists confirm S_model of nuclei

And now we would like to note the surprising coincidence of the results just presented by us (on the grouping of nucleons in nuclei of atoms in "beads" of four nucleons) with the latest data of Japanese scientists.

This part of the article was formulated in December 2014. What was our surprise (and joy) when in March 2015 we met on the Internet with the article [14], describing the results of the work of scientists from Kyoto University (Japan), in which the results of simulation of rotating atomic nuclei were given by methodology the Hartree-Fock. Below in Fig. 5_14 shows the result of this simulation in a graphical form.

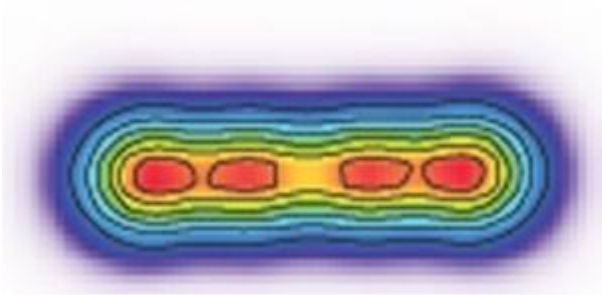


Fig. 5_14. Calculations show that the rotating nucleus of oxygen-16 can deformed into 4 separate alpha particles placed along the axis of rotation.

These results very closely coincide with our S model of isotope nuclei, built on the basis of beads of blok four-nucleons, see Fig. 5_13.

In Japanese colleagues, however, the result obtained refers to the rotating nuclei of atoms, i.e. elongated in a line by centripetal force.

According to the S_model represented by us, the nuclei of atoms are a string of "beads", each of which consists of four nucleons, and this thread is twisted into a "bend" and "tangle" , which can be straightened out (straight) in a straight thread under strong rotation.

In the next section of this chapter, we will analyze the mechanism of twisting the nuclei in "bend" and "tangle" .

S_analysis of the mechanism of twisting of nuclei in "bend" and "tangle"

<u>A small note</u>

Given the completely new nature of many of the objects and processes we are considering, their individual characteristics are not born in a complex but locally from the point of view of the problem being solved at the given moment. When solving the next problem, we often have to return to the same objects or processes, specifying some of their characteristics, or ascertaining to new characteristics of these objects or processes.

Sometimes, on the contrary, when considering a certain question, we have to "mention" some still "undeveloped" characteristics of objects or processes, which will be considered in more detail in the following chapters.

This was the logic of the process of detailing all the new "sections" of S_theory.

At the final presentation of the work material, we decided to keep this logic and do not change this order of detailing the characteristics of objects or processes, while pursuing the goal of simplifying the perception of each individual issue without overloading it with details that are not directly related to it.

However, in this case, the description of the characteristics of objects or processes is not comprehensive (in one place), but is artificially divided into a number of fragments that are necessary to consider a particular "section" of S_theory.

Now, again, we are talking about slit magnets, or, more precisely, about the different directions of their magnetic moments in different quarks, which we have "hidden" in describing the general scheme for assembling nucleons into isotope nuclei in the form of "sausage" in Chapter 4 (see Fig. 4_1).

<u>Detailedization of the scheme for assembling nucleons into the nuclei of isotopes - the mechanism of the kink of the axis of the nuclei</u>

As already noted, the attraction of nucleons to each other is provided by slotted magnets of nucleons. Each nucleon has three slit magnets formed by azimuthal vortices of three quarks, each closed by on themselves along a chain of toroidal vortices of mu- and tau-ёneutrinos (see Fig. 2-13). At the same time, we did not specify the directions of the magnetic moments of the slit magnets by announcing the "latch" mechanism of all three pairs of magnets, conditionally "assigning" them the same direction (see Fig. 4_1).

In fact, everything is "little" wrong. The quarks u and d forming the "quark hoops" of all nucleons have the same direction of internal magnetic vortices (which allows them to form a common torus of "quark hoop"), but they have the opposite direction of azimuthal electric vortices (which explains the generation of them opposite electric charges). The latter circumstance means that the directions of the magnetic moments for the quarks u and d are opposite. As a result, for all nucleons, two slit magnets (in of the same name quarks) have unidirectional magnetic moments, and the third slit magnet (for the opposite quark) has the opposite direction of the magnetic moment, see Fig. 5_15 (a). This also applies to relic neutrons.

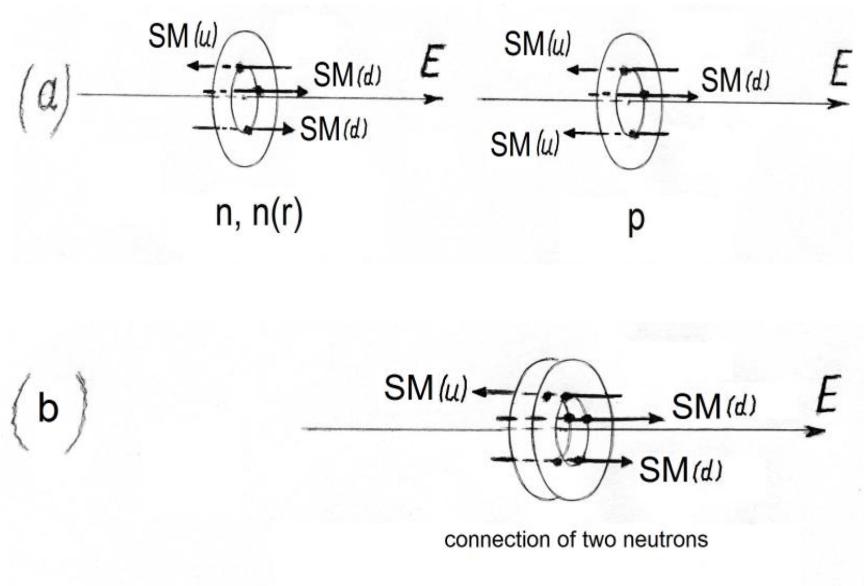


Fig. 5_15. Different directions of the magnetic moments of three slit magnets in the nucleon and the connection of two neutrons to three magnetic latches

The above "pictures" do not mean that the general scheme for assembling nucleons in the nucleus of isotopes given in Chapter 4 is not correct. It is "correct", but only for the case if relic neutrons, when assembled into nuclei, do not change their a type, i.e. remain neutrons and moor also to a neutron (nr_ nucleosynthesis of isotopes in the group of one chemical element), see Fig. 5_15 (b).

It should be recalled that the convergence of the relic neutron with the already formed nucleus at "distant approaches" comes under the action of their electric dipole moments (E).

When the relict neutron approaches a nucleus for a distance commensurate with the size of the nucleons, slit magnets enter the "work". Relict neutron under the action of magnetic forces from slotted magnets (of the extreme nucleon of the nucleus) is scrolled around its central axis in such a way that all three of its slit magnets find each their "companion" at the extreme nucleon of the nucleus, to which the relic neutron are mooring. As a result, when the relict neutron touches the extreme nucleon, all three pairs of slit magnets form three strong magnetic latches.

BUT (!), The described "picture" is valid only if the relic neutron remains a neutron, i.e. He did not change the orientation of the magnetic moments of his slit magnets.

And a completely different "picture" is obtained if at a given stage of nr_nucleosynthesis the relic neutron becomes a proton.

We recall that when a relic neutron is converted into a proton for nr_nucleosynthesis, a micro blast occurs inside the relic neutron, in which a minimum of six mu-neutrinos and a d-quark burst, and as a result, u-quark is formed (confinement!). Also an electron are formed. When a d-quark is replaced by an u-quark, its azimuthal electric vortex changes the direction , as a result which the direction of its magnetic moment changes. As a result, this slit magnet instead of attraction will start repulse from its companion in the adjacent nucleon, and only two pairs of other slit magnets will work on the attraction.

There's a possibility, of course, it is possible that the proton formed will "jump off" and unfold in such a way that the directions of the magnetic moments of all three slit magnets coincide (for this, him will have to turn to the nucleus by the other side). But this is unlikely to happen, because two magnetic latches have already latched and they will not let the proton "jump off" and roll over.

Two pairs of attracting slit magnets, of course, will overpowered one pair of repulsive slit magnets and the nucleus will grow, but as a result of repulsion of the third pair of slit magnets in the growth axis of the isotope core, a kink appears (see Fig. 5-16).

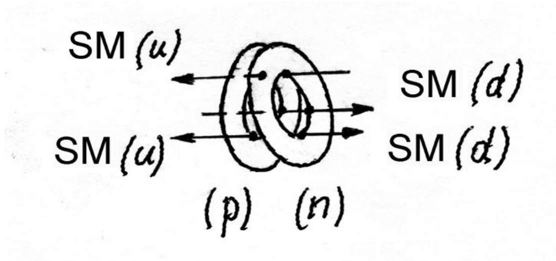


Fig. 5_16. Fracture of the axis of the nucleus when different nucleons are connected

We have analyzed two variants of joining a new relic neutron to the nucleus (to a neutron):

(a) (nr → n) + n = coaxial connection

(b) (nr → p) + n = fracture of the axis of the nucleus

There are two more options for attaching a new relic neutron to the nucleus (to the proton):

(c) (nr → n) + p =?

(r) (nr → p) + p =?

The results of joining the relic neutron in variants (c) and (d) will be discussed later, when we will be disassemble the S_mechanisms of nr_ nucleosynthesis of the isotope cloud. Now for us the very fact of the fracture of the axis of nuclei in the process of nr_nucleosynthesis is important. Running a little forward, we formulate the following conclusion.

Conclusion: A new relic neutron joins the nucleus co-axially, if the species of adjacent nucleons coincide, and joins the nucleus not coaxially, but at some angle, if the species of the nucleon into which the relic neutron has turned does not coincide with the kind of nucleon to which the new nucleon joins.

Taking into account that at each new break the axis of the nucleus curves to some angle, the previously presented general scheme (S_model) of assembly of isotope nuclei (Fig. 4_1) is transformed from "sausage" into "bend" , see Fig. 5_17.

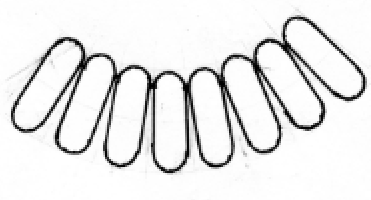


Fig. 5_17. The transformation of the "sausage" of the nucleus into a "bend"

If the slit magnets (quarks) in the nucleons were not three but two, then all the breaks of the axis of the nucleus would occur in the same plane, and with the accumulation of the total break of the axis of the nucleus equal to

360 °, the ends of the "bend" would meet each other and the core would have turned into a super-bagel. The degree of rigidity and stability of such a nucleus would be much higher and could be considered as a physical model of theoretically predicted isotopes related to the "island of stability".

However, the number of gap magnets (quarks) in nucleons is three. As a result, the core axis breaks not in one plane, but along a three-dimensional broken line. This leads to the fact that with the accumulated fracture of the axis of the nucleus equal to 360 °, the ends of the "bend" do not occur together , and the nucleus continues to grow, being twisted into a "tangle".

But even in the "tangle" version, it is impossible to exclude the possibility that at some turn the ends of the axis will turn out to be at a distance commensurate with the size of the nucleons. Between the ends of the axis there will be an attraction of slotted magnets and the "tangle" will snap into an isotope of the "island of stability".

The reader can recall our conclusion about the closing of the exit of flagellums of the gluons_SIF in the first nucleon of the nucleus (see Figure 5_4), which is the actual "prohibition" of snapping the two ends of the nucleus in the form of a "tangle" into the looped core of the "island of stability" isotope. However, this "prohibition" can be removed by an intermediate α-decay reaction, in which the α-particle breaks off from the nucleus, and carries away the first nucleon with a "sealed pier" for nucleons. As a result, it becomes possible to form isotopes of the "island of stability".

Moreover, given a certain variety of possible variants of the fractures of the vector of the core axis along the directions of the fracture in certain sections, the variants of "winding the coil" can be a several. Accordingly, a certain number of isotopes belonging to the "island of stability" can be formed both in the number of nucleons (different elements) and in their composition (different isotopes of one element).

As already noted, the process of primary nr_nucleosynthesis of the spectrum of isotope nuclei ends with the end of the relic neutron stock. Probably, this process ended, before reaching the hypothetical "island of stability".

Theoretical and experimental studies predict that the "island of stability" begins after the 120th element of the periodic table consisting of, on the order of 300 nucleons.

Let's try to calculate the hypothetical isotope form from the "island of stability".

Calculation of the hypothetical shape of isotope of the "island of stability"

For the calculation, we use the isotope with the ordinal number (number of protons) 126, mass (number of nucleons) 310, and accordingly the neutron number equal to 184, hypothetically relating to the "stability island".

We calculate the radius of the nucleus of this isotope according to the well-known Bohr formula:

R of the Bohr nucleus = 1.23 * A1 / 3 = 1.23 * 3101/3 = 8.3245 (fm)

The nucleus diameter then amounts to: D of the Bohr nucleus = 16.649 (fm)

We take this diameter for the size of the nucleus of the isotope according to the S_model, i.e. for the outer diameter of a string of nucleons twisted into a "tangle" consisting of averaged "beads" of four nucleons (0.9093 fm in length and 1,042 fm in diameter).

Determine the diameter of winding the "tangle" along the middle line taking into account the diameter of the "beads":

D winding "coil" along the middle line "tangle" = 16,649 - 1,042 = 15,607 (fm)

The circumference of the winding of the "tangle" of the isotope along the middle line:

L of the winding circle along the midline = π * 15,607 = 49.03 (fm)

Let's count the number of "beads" in the "tangle" of the isotope:

N number of "beads" in the "sausage" of the isotope = 310/4 = 77.5 (pcs)

The length of the "tangle" of the isotope:

L "sausages" of the isotope = 77.5 * 0.9093 = 70.47 (fm)

Accordingly, the number of revolution in the "tangle" of nucleons of the nucleus of our isotope will be equal to:

M number of revolution of the "tangle" of nucleons = 70.47 / 49.03 = 1.44 (revolution) = 517 ^{o} (degrees).

The resulting number (1.44 turns) means that the ends of the "tangle" of the nucleus of our isotope, hypothetically related to the "island of stability", have closed through two shortened turns which less the diameter, and correspond to the chords of the "tangle" of 0.72 lengths full circle, passing through the diameter of the sphere. In other words, the nucleus our test isotope has the form of a figure eight, superimposed on a spherical surface (see Fig. 5_18). We have conventionally depicted the spherical surface as not transparent, in order to improve the image perception of the shape of the nucleus.

Fig. 5_18. Form of the nucleus of isotope of "stability island" by S_theory (tangle)

Number of nucleons and "beads" in one shortened loop = 310/2 = 155 nucleons (~ 39 beads)

Accordingly, all isotopes with a number of nucleons ~ 80 pcs. (~ 20 beads) have a nucleus length equal to half of the shortened turns, which corresponds to the maximum size of the nucleus equal 16,649 fm.

Our the isotope contains 126 protons, which are built into the nucleus of the isotope, will be considered uniformly, introducing a break in the axis of the isotope each time. The neutrons following the proton also introduced a break in the axis of the isotope. So there in total were 252 fractures of the isotope axis. The angle of one break in the axis of the isotope core is then:

α fracture of the axis = 517o / (252 - 1) ≈ 2 ^{o}

It follows from the above calculation that the "tangle" of nucleons, which forms the nucleus of heavy isotopes, is hollow inside, and the surface of the "tangle" itself is all in holes (lumens).

We calculate the probability of a collision when bombarding the calculated nucleus with neutrons (Dn = 0.8768 fm).

The area of nucleus is estimated as the area of the circle:

S of the nucleus = π * 16,649 * 16,649 / 4 = 217,705 (fm^2)

The area of hits is estimated as 3 nucleus diameters (there is such an angle of "shelling") with a width equal to the width of the "sausage" plus two maximum neutron sizes (on both sides of the sausage):

S hits = 3 * 16,649 * (1,0421 + 2 * 0.8768) = 139.64 (fm^2)

The average weighted probability of neutron collision with the "sausage" of the nucleus when the neutron hits the "target" of the nucleus is equal to:

P collision (ST) = 139.64 / 217.705 = 64 (%)

Finally, we calculate the density of the nucleus , as the ratio of its mass to the sphere described around the "tangle" of the nucleons of the nucleus. We calculate the nucleus mass as the sum of the masses of 126 reference protons and 184 reference neutrons:

M of the nucleus = 124 * 1.6726 + 184 * 1.6749 = 518.939 * 10^{-24} (g)

Volume of the core (described sphere):

V of the nucleus = π * D3 / 6 = 214.76 * 10^{-38} (cm^3)

Density of the nucleus :

ρ of the nucleus = 518,939 * 10-24 / 214.76 * 10-38 = 2.1 * 10^{14} (g / cm^3), which corresponds to the reference data on the density of isotope nuclei (the other actually could not have been, since we performed the calculation of the density using a purely traditional scheme without using the elements of S_theory).

Conclusions:

1) The nucleus of the isotope (A = 310, Z = 126, N = 184), hypothetically referring to the "island of stability", according to the calculated S-model is a "tangle" twisted in the form of a figure eight and superimposed on a spherical surface.

2) The nucleus is largely "empty" and "transparent." The average weighted probability of a collision of a flying neutron falling into the "target" of the nucleus is approximately 64%. Those. only two of the three neutrons caught in the square of the nucleus interact with it.

3) And one more "paradoxical" conclusion from the calculation - All nuclei of isotopes with the number of nucleons equal to or greater than 80 pieces (20 beads) have approximately the same core size, equal to 16,649 fm. These parameters correspond to the isotope of krypton. In other words, the growth of the size of the nuclei occurs in the range from one to 80 pieces. nucleons (nucleus formation in the form of a "half moon"), further the increase of the number of nucleons leads to a twist of nucleus to the "bend" and then to the "tangle" with a maximum number of turns equal to two (0.72 of the maximum diameter of the nuclei) in the region of the nuclei , belonging to the "island of stability".

Conclusion of the 5th chapter

The proposed in S_theory S_ design of nucleons and its electromagnetic properties make it possible to simulate the mechanism of "assembling" nucleons into the nuclei of atoms in the process of nr_nucleosynthesis in the form of peculiar "sausages" (consisting of beads). Numerical modeling of this process reveals the existence of certain regularities in it, namely, the grouping of nucleons into "beads" of four nucleons, the bending of the "sausage" axis at the addition of another relic neutron with its transformation into a proton, which leads to the twisting of "sausages" in "bend" and "tangle" .

The proposed mechanism and its regularities make it possible to propose a variant for the appearance of stable nuclei in isotopes with ordinal numbers in the periodic table of more than 120, and also to construct a model and calculate its geometric parameters for such a hypothetical isotope from the "island of stability".

Chapter 6. Primary nucleosynthesis of isotope clouds (Horizontal algorithm)

We will continue the verification of S_theory by conducting an S_ analysis of the process of primary nr_nucleosynthesis of the isotope cloud.

Was there a "main stream"?

Selection of the "main stream" in the summary table of isotopes has helped us a lot in analyzing the issues related to the process of primary nr_ nucleosynthesis of isotope nuclei. In particular, with the help of main-stream, we were able to analyze in detail the correlation (connection and dependence) of the forces of strong interaction of nucleons with elements of their S-models.

Also on the graphs built on the basis of main-stream, we saw a grouping of nucleons into "beads" of 4 pcs, which helped us model the geometry of the nuclei.

Paying tribute to main-stream, let's ask now - was "main stream" the same "path" that the real process of primary nr_nucleosynthesis was on?

The answer is unequivocal - No!

Why?

Yes, because in this case all matter would consist only of stable isotopes. After the exhaustion of all the relic neutrons, stable isotopes could never have produced unstable isotopes that have the same number of nucleons, but usually a large mass. The reactions of β- decays and β+ decays "work" precisely in the opposite direction, more stable isotopes with a lower mass are obtained from unstable isotopes with a larger mass.

And this means that the process of primary nr_nucleosynthesis goed a "broader front", i.e. "Simultaneously" was the formation of the entire spectrum of isotopes, including isotopes, which later disintegrated during the reactions of β-decays. The only condition for such formation of isotopes was an increase in the number of nucleons in the nucleus and compliance with the rule of a negative mass defect, i.e. the mu-neutrino was bursted at each step of nr_nucleosynthesis, in this case the next relic neutron was turned in the proton or neutron . For example, from the isotope deuterium (2H), either the tritium isotope (3H) or the helium-3 (3He) isotope could be formed. As a result of this primary nr_nucleosynthesis, not only the main-stream isotopes were formed, but the entire isotope cloud.

The isotope cloud formation algorithm

From the source [12] we took a complete table of isotopes from 1H to 260Fm.

With a new table of isotopes, we calculated the number of burst and remaining mu neutrinos as with the "main stream" table, but with one significant change related to the order of steps of nr_ nucleosynthesis of isotopes. The order of steps of nr_nucleosynthesis became two-dimensional, namely:

1. We divided all the isotopes into groups, each group belongs to one element of the periodic table. In each group, the isotopes are lined up by the growth of the number of nucleons in them.

2. Synthesis of the first isotopes in groups proceeds by attaching an additional relic neutron to the parent isotope, converting it into a proton. The first isotope of each group is synthesized from the corresponding isotope belonging to the isotope group of the previous element of the periodic table and having one nucleon less.

3. Subsequent isotopes of the group are synthesized from the previous isotope of this group by attaching the next relic neutron with its transformation into a neutron.

The proposed two-dimensional order of synthesis of the isotope cloud is schematically shown in Fig. 6_1. We conditionally called it the "Horizontal Algorithm", because most of the isotopes "in the given algorithm (~ 97%) are formed successively along the horizontal rows, by joining the relic neutron with conversion it to a "simple "neutron. And only the first isotopes of horizontal series (~ 3%) are formed by attaching relic neutrons with their transformation into a proton.

Эл	Z \ N	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
H	1	1H	2H	3H	4H	5H	6H	7H										
He	2		3He	4He	5He	6He	7He	8He	9He	10He								
Li	3		4Li	5Li	6Li	7Li	8Li	9Li	10Li	11Li	12Li							
Be	4		5Be	6Be	7Be	8Be	9Be	10Be	11Be	12Be	13Be	14Be	15Be	16Be				
B	5		6B	7B	8B	9B	10B	11B	12B	13B	14B	15B	16B	17B	18B	19B		
C	6			8C	9C	10C	11C	12C	13C	14C	15C	16C	17C	18C	19C	20C	21C	22C
N	7				10N	11N	12N	13N	14N	15N	16N	17N	18N	19N	20N	21N	22N	23N
O	8					12O	13O	14O	15O	16O	17O	18O	19O	20O	21O	22O	23O	24O
F	9						14F	15F	16F	17F	18F	19F	20F	21F	22F	23F	24F	25F
Ne	10							16Ne	17Ne	18Ne	19Ne	20Ne	21Ne	22Ne	23Ne	24Ne	25Ne	26Ne
Na	11								18Na	19Na	20Na	21Na	22Na	23Na	24Na	25Na	26Na	27Na
Mg	12								19Mg	20Mg	21Mg	22Mg	23Mg	24Mg	25Mg	26Mg	27Mg	28Mg
Al	13									21Al	22Al	23Al	24Al	25Al	26Al	27Al	28Al	29Al
Si	14									22Si	23Si	24Si	25Si	26Si	27Si	28Si	29Si	30Si
P	15										24P	25P	26P	27P	28P	29P	30P	31P
S	16											26S	27S	28S	29S	30S	31S	32S
Cl	17												28Cl	29Cl	30Cl	31Cl	32Cl	33Cl
Ar	18													30Ar	31Ar	32Ar	33Ar	34Ar
K	19														32K	33K	34K	35K
Ca	20															34Ca	35Ca	36Ca
Sc	21																36Sc	37Sc
Ti	22																	38Ti

Fig. 6_1. Two-dimensional order of synthesis of an isotope cloud by the "Horizontal Algorithm"

To save space, we have shown in Fig. 6_1 only the initial part of the isotope cloud. Of course, the algorithm (order) of nr_nucleosynthesis of the isotope cloud is purely conditional. We took it to formalize the calculation process. In fact, the process of nr_ nucleosynthesis of isotopes in the cloud could have proceeded in a completely different order, along a different path, or rather along other paths, because they can be quite a lot.

The question is how much the results of the calculation on the algorithm (paths) chosen by us differ from the calculation results for other (pathways) algorithms (?) For what this affects, we will certainly discuss further in our work. Now for us the main thing is that this two-dimensional order of isotope synthesis ("Horizontal Algorithm") makes it possible to calculate the number of burst and remaining mu-neutrinos in all cloud isotopes and construct the corresponding three-dimensional graphs.

Considering that the new table contains much more isotopes than the "main stream" (about 3000 lines), we will not give it here completely, if you want, you can do this calculation yourself or ask us for an Excel file with these calculations.

But before proceeding to the consideration of the calculation results, it is necessary to give several explanations concerning the correction of the masses of individual isotopes in the calculation process.

Correction of isotope masses in the calculation of an isotope cloud

It should be noted that when calculating the number of mu-neutrinos that burst and remained intact during the nr-nucleosynthesis of an isotope cloud, some reference masses of individual isotopes failed to "test" for compliance with the basic S_formulas of typical variants of mu-neutrino burst processes. We accordingly had to make corrections to the masses of these isotopes.

We remind you that when calculating the main stream table and the isotope cloud table, we use only three typical variants of mu-neutrino bursting processes. Once again, we give a list of these options:

<u>The first option</u> - bursts **8 pcs.** mu-neutrinos and two quarks (d + d) are destroyed with the formation of two new quarks (d + u). As a result, the relic neutron decays into a proton and an electron, which combine to form the isotope 1H.

<u>The second option</u> - mu-neutrinos to burst from **1 pcs.** up to 126 pcs. "far" from the "hoop of quarks". The "quark hoop" remains intact (without changing the quark composition). The relic neutron turns into an "ordinary" neutron. According to this scheme, a second and subsequent isotopes are formed in the group of isotopes belonging to one element of the periodic table.

<u>The third option</u> - bursts of **6 pcs.** mu-neutrino under the quark d, which is replaced by the quark u. As a result, the relic neutron decays into a proton and an electron, with the formation of the first isotopes in each isotope group belonging to the same element of the periodic table.

In bold type, critical parameters are identified that need to be monitored when calculating nr_nucleosynthesis steps for these variants.

Checking isotopes of the first option

The first option does not require verification, because It is used only once during the decay of the relict neutron into a proton and an electron with the formation of an isotope 1H. We have already calculated this variant, the number of initial mu-neutrinos in a relic neutron is 61 pieces, the number of burst mu-neutrinos is 8 pieces, and the number of mu-neutrinos remaining in the proton is 53 pieces.

Testing of the isotopes of the second variant

In the isotopes formed by the second variant, it is necessary to check that the number of burst mu-neutrinos is not less than 1 pc. In other words, this means that the mass gain in the formation of isotopes in the second variant should not be greater than the mass of the relic neutron, minus the mass of one mu-neutrino, plus the mass of gluons formed.

We remind you that when nr_nucleosynthesis of mainstream isotopes, we tested and corrected the mass of the isotope 5He by this method. His mass gain was greater than the mass of the relic neutron, and we had to correct the mass of the isotope 5He by 0.002% using the formula:

5He = 4He + nr - $\nu\mu$ + g1, (1)

where g1 is the mass of the formed one flagellum of gluons filling the "hole" from one burst mu neutrino. We calculated this value according to the S-equation for the formation of a proton from a relic neutron. In this reaction, 8 pieces burst. mu-neutrino, and 8 pcs flagellums of gluons_SIF with a total mass of 0.00002 MeV were formed (see the calculation of the main stream table). Accordingly, the mass of one flagellum g1_SIF (when 1H is formed) is 0.0000025 MeV.

The mass values of the gluon flagellum calculated by this method for the reactions of formation of different isotopes are completely different, but the reduced mass is the smallest of them. It practically does not affect the results of calculations, but we found it necessary to include it in the calculation for the purity of the physical interpretation of our calculations.

We repeated the reason and the technique for correcting the mass of the isotope 5He in such detail because, in calculating the nr_nucleosynthesis in an isotope cloud, we encountered a similar situation in 22 more isotopes (of the total number of isotopes of the order of 3000 pcs). Below is the table 6 with a list of isotope data, indicating their reference masses, mass_ST calculated from the above formula (1), the absolute and percentage deviation of the mass value, as well as the lifetime or half-life of these isotopes from the initial reference table.

Table. 6 Correction of the mass of isotopes formed in the second variant.

Mnemo-code isotope	The mass of the isotope accepted in ST for calculations (aem)	The mass of the isotope accepted in ST (MeV)	Mass of the isotope reference (aem)	Mass of the isotope reference (MeV)	The difference in reference mass and mass_ST (MeV)	Corr. isotope masses (%)	Period half-life
4H	4.0253127	3749.5548569	4.0278100	3751.8810938	-0.0024973	-0.0620%	1.39(10)×10−22 с
5H	5.0339776	4689.1202359	5.0353100	4690.3613603	-0.0013324	-0.0265%	> 9.1×10−22 с ?
6H	6.0426425	5628.6856149	6.0449400	5630.8257091	-0.0022975	-0.0380%	2.90(70)×10−22 с
7H	7.0513074	6568.2509939	7.0527500	6569.5947387	-0.0014426	-0.0205%	2.3(6)×10−23 с
5He	5.0112682	4667.9665388	5.0122200	4668.8531624	-0.0009518	-0.0190%	700(30)·10−24 с
7He	7.0275540	6546.1248295	7.0280210	6546.5598221	-0.0004670	-0.0066%	2.9(5)·10−21 с
9He	9.0425869	8423.1160085	9.0439500	8424.3857130	-0.0013631	-0.0151%	7(4)·10−21 с
10He	10.0512518	9362.6813875	10.0524000	9363.7508988	-0.0011482	-0.0114%	2.7(18)·10−21 с
12Li	12.0524629	11226.7976269	12.0537800	11228.0244826	-0.0013171	-0.0109%	<10 нс
15Be	15.0515549	14020.4340133	15.0534600	14022.2085875	-0.0019051	-0.0127%	<200 нс
16Be	16.0602198	14959.9993923	16.0619200	14961.5830883	-0.0017002	-0.0106%	<200 нс
18B	18.0556549	16818.7353219	18.0561700	16819.2151194	-0.0005151	-0.0029%	26 нс
21C	21.0489849	19607.0044395	21.0493400	19607.3351980	-0.0003551	-0.0017%	<30 нс
24N	24.0498849	22402.3249672	24.0510400	22403.4009209	-0.0011551	-0.0048%	52 нс
25N	25.0585498	23341.8903462	25.0606600	23343.8559547	-0.0021102	-0.0084%	260 нс
28F	28.0354249	26114.8318071	28.0356700	26115.0601012	-0.0002451	-0.0009%	< 40 нс
30F	30.0519249	27993.1895811	30.0525000	27993.7252682	-0.0005751	-0.0019%	< 260 нс
33Ne	33.0486849	30784.6537233	33.0493800	30785.3011897	-0.0006951	-0.0021%	< 260 нс
36Na	36.0511549	33581.4366967	36.0514800	33581.7395103	-0.0003251	-0.0009%	260 нс
39Mg	39.0462349	36371.3359289	39.0467700	36371.8343562	-0.0005351	-0.0014%	260 нс
43Si	43.0284549	40080.7502085	43.0286600	40080.9412428	-0.0002051	-0.0005%	15.0 мс
49S	49.0228349	45664.4795778	49.0236200	45665.2108787	-0.0007851	-0.0016%	200.0 нс

As we can see, all the isotopes in Table 6 have a very short lifetime (half-life). This circumstance probably also predetermines some errors in the experimental determination or calculation of the masses of these isotopes. In addition, for all isotopes, the value of the mass correction does not exceed hundredths or thousandths of a percent, so we found an adjustment of the reference isotope data masses possible.

Testing isotopes of the third option

In the isotopes formed by the third variant, it is necessary to verify that the number of burst mu-neutrinos was not less than 6 pieces. In this variant, isotopes are formed with the transformation of the relic neutron into a proton (the first isotopes of the groups). The verification of this quantities of quantities bursting also reveals a number of reference masses of isotopes in which this condition is not fulfilled. Such isotopes turned out to be approximately twice as large (46 pieces), their list is given in Table. 7. S_theory does not allow less than 6 pcs of mu-neutrinos to burst when a relic neutron is converted into a proton. Therefore, we are "forced" to correct the reference masses of these isotopes according to the following formula (using the 4Li isotope example):

4Li = 3He + nr - 6vμ + (u-d) + (e-) + 6g1 (2)

This formula (2) is the basic S_ formula for the formation of isotopes for nr_nucleosynthesis in the third variant.

Table. 7. Correction of the mass of isotopes formed by the third option.

Mnemo-code isotope	The mass of the isotope accepted in ST for calculations (aem)	The mass of the isotope accepted in ST (MeV)	Mass of the isotope reference (aem)	Mass of the isotope reference (MeV)	The difference in reference mass and mass_ST (MeV)	Corr. isotope masses (%)	Period half-life
4Li	4.0242533	3748.5680745	4.0271900	3751.3035675	-2.7354930	-0.0729%	91(9)·10−24 с
5Be	5.0324773	4687.7227593	5.0407900	4695.4659477	-7.7431885	-0.1649%	
6B	6.0407014	5626.8774430	6.0468100	5632.5676030	-5.6901600	-0.1010%	
10N	10.0392607	9351.5117359	10.0416500	9353.7373376	-2.2256018	-0.0238%	200 мс
14F	14.0330360	13071.6897165	14.0350600	13073.5750358	-1.8853193	-0.0144%	
19Mg	19.0341940	17730.2386818	19.0354700	17731.4272533	-1.1885715	-0.0067%	
21Al	21.0270870	19586.6066691	21.0280400	19587.4943745	-0.8877054	-0.0045%	35 нс
24P	24.0337440	22387.2898173	24.0343500	22387.8542850	-0.5644677	-0.0025%	
28Cl	28.0270540	26107.0343685	28.0285100	26108.3906037	-1.3562351	-0.0052%	
32K	32.0203440	29826.7602740	32.0219200	29828.2283018	-1.4680279	-0.0049%	1+
36Sc	36.0131640	33546.0483976	36.0149200	33547.6840874	-1.6356898	-0.0049%	
40V	40.0098340	37268.9227666	40.0110900	37270.0927091	-1.1699426	-0.0031%	2-
44Mn	44.0059340	40991.2661796	44.0068700	40992.1380482	-0.8718686	-0.0021%	105 нс
45Fe	45.0141580	41930.4208629	45.0145800	41930.8139284	-0.3930655	-0.0009%	4.9 мс
47Co	47.0090340	43788.6359995	47.0114900	43790.9237338	-2.2877343	-0.0052%	
48Ni	48.0172580	44727.7906827	48.0197500	44730.1119357	-2.3212530	-0.0052%	10 мс
52Cu	51.9959440	48433.9130471	51.9971800	48435.0643587	-1.1513117	-0.0024%	3+
56Ga	55.9922040	52156.4055015	55.9949100	52158.9261112	-2.5206097	-0.0048%	3+
60As	59.9899740	55880.3045176	59.9931300	55883.2442958	-2.9397782	-0.0053%	5+
67Br	66.9634340	62376.0410943	66.9647900	62377.3041811	-1.2630869	-0.0020%	1/2-
71Rb	70.9634840	66102.0639053	70.9653200	66103.7741170	-1.7102117	-0.0026%	5/2-
76Y	75.9581740	70754.5879789	75.9584500	70754.8450578	-0.2570789	-0.0004%	500 нс
81Nb	80.9486240	75403.1625162	80.9490300	75403.5406887	-0.3781725	-0.0005%	44 нс
85Tc	84.9483140	79128.8499975	84.9488300	79129.3306339	-0.4806364	-0.0006%	<110 нс
89Rh	88.9484840	82854.9845957	88.9488400	82855.3161928	-0.3315972	-0.0004%	10 мс
93Ag	92.9486440	86581.1098788	92.9497800	86582.1680413	-1.0581624	-0.0012%	5 мс
97In	96.9479940	90306.4806499	96.9495400	90307.9207267	-1.4400768	-0.0016%	5 мс
103Sb	102.9385240	95886.6237700	102.9396900	95887.7098762	-1.0861062	-0.0011%	100 мс
108I	107.9432340	100548.4814138	107.9434800	100548.7105437	-0.2291298	-0.0002%	36(6) мс
112Cs	111.9498240	104280.5961971	111.9503000	104281.0395772	-0.4433800	-0.0004%	500 мкс
117La	116.9496040	108937.8615751	116.9500700	108938.2956385	-0.4340634	-0.0004%	23.5 мс
121Pr	120.9548640	112668.7374777	120.9553600	112669.1994861	-0.4620084	-0.0004%	600 мс
126Pm	125.9571040	117328.2943296	125.9575200	117328.6818183	-0.3874887	-0.0003%	500 мс
130Eu	129.9628640	121059.6359795	129.9635700	121060.2936014	-0.6576219	-0.0005%	1.1 мс
136Tb	135.9607940	126646.6721529	135.9613800	126647.2179954	-0.5458424	-0.0004%	200 мс
140Ho	139.9677640	130379.1409107	139.9685400	130379.8637368	-0.7228261	-0.0006%	6 мс
145Tm	144.9686040	135037.3936709	144.9700700	135038.7592278	-1.3655569	-0.0010%	3.1 мкс
150Lu	149.9722640	139698.2732434	149.9732300	139699.1730540	-0.8998106	-0.0006%	43 мс
155Ta	154.9730840	144356.5073760	154.9745900	144357.9101909	-1.4028149	-0.0010%	13 мкс
160Re	159.9811440	149021.4855231	159.9821200	149022.3946462	-0.9091231	-0.0006%	860(120) мкс [0.82(+15-9) мс]
164Ir	163.9909140	152756.5624653	163.9922000	152757.7603503	-1.1978850	-0.0008%	1 мс
169Au	168.9963740	157419.1187280	168.9980800	157420.7078404	-1.5891124	-0.0010%	150 мкс
176Tl	175.9996440	163942.6231375	176.0005900	163943.5043175	-0.8811800	-0.0005%	5.2 мс
184Bi	184.0000940	171394.9948039	184.0011200	171395.9504973	-0.9556934	-0.0006%	6.6 мс
193At	192.9995590	179777.9430006	192.9998400	179778.2047340	-0.2617334	-0.0001%	28(+5-4) мкс
199Fr	199.0069030	185373.7482537	199.0072600	185374.0807859	-0.3325322	-0.0002%	16 мс

As you can see, all the isotopes in Table 7 are not stable, although most of them have a "decent" lifetime or this parameter is not filled. Just as in the case of correcting the mass of isotopes formed in the second variant, for most of these isotopes, the value of the mass correction does not exceed hundredths or thousandths of a percent. There are, however, a couple of isotopes (5Be, 6B), whose mass correction reaches tenths of a percent.

Total in Table. 7 had 46 isotopes, which is quite a lot. All of them were formed with the transformation of the relic neutron into a proton, which means they are at the lower boundary of the cloud of isotopes (the left side of the cloud) and are a priori subject to the reactions of β+_decay with a high probability, i.e. are not stable, which makes it difficult to accurately determine their mass. This circumstance gives some "hope" that the corrected mass of these isotopes is "valid".

The chosen (order) algorithm for the formation of isotopes in the isotope cloud (in groups, from left to right) makes it possible to calculate and analyze the results of the process of nucleosynthesis of the isotope cloud.

With the chosen algorithm for the formation of isotopes in isotope cloud and using their reference masses, S_theory "requires" unconditional correction of the masses of the above isotopes, therefore, in the calculations of table of the mu-neutrino bursted for the shaping isotope cloud, the mass_ST was used to calculate .

Checking the remainder of the mu-neutrino in the 56Fe isotope

Just like in main stream, after the first iteration of calculating the nr_nucleosynthesis of the isotope cloud, the mu-neutrino residue in the 56Fe isotope turned out to be 509 pcs, i.e. did not equal 504 pcs. (as it should be in S_theory)

The technique for solving this problem has already been worked out in the calculation of main stream isotopes. This problem means that when the 56Fe isotope is formed, there are five steps of nr_nucleosynthesis, at which the mass defect had a boundary value when rounded to an integer number of burst mu-neutrinos. "Impartial" mathematics rounded them to a smaller side, as a result, the number of remaining mu-neutrinos increased by 5 pcs. To reduce the number of burst mu-neutrinos in accordance with S_theory, these isotopes need to be "slightly" reduced in mass. Below in Table. 8 shows a list of these isotopes indicating their masses before and after correction.

Table. 8. Correction of isotope masses for 56Fe

Iso-tope	Weight isotope before corrective (аем)	Weight isotope before corrective (MeV)	ST_Smass isotope after corrective-tion, accepted for calculations (аем)	ST_Smass isotope after corrective-the accepted for calculations (MeV)	Difference the original mass and masses_ST (MeV) = corr. masses (reduced tion)	Corr. masses isotope (reduced tion) (%)	Bursted ν (μ) by a step before corrective-the (fraction)	Bursted ν (μ) one step closer before corrective-the (whole)	Bursted ν (μ) one step closer after corrective-the (fraction)	Bursted ν (μ) one step closer after correctness the (whole)
4Li	4.024253	3748.568084	4.024253	3748.568065	0.0000186	0.00000050%	-5.9999193	6	-6.0000196	7
10N	10.039260	9351.511736	10.039260	9351.511717	0.0000186	0.00000020%	-5.9999193	6	-6.0000196	7
21Al	21.027087	19586.606678	21.027087	19586.606659	0.0000186	0.00000010%	-5.9999193	6	-6.0000196	7
44Mn	44.005934	40991.266187	44.005934	40991.266168	0.0000186	0.00000005%	-5.9999193	6	-6.0000196	7
45Fe	45.014158	41930.420872	45.014158	41930.420835	0.0000373	0.00000009%	-5.9999193	6	-6.0000196	7

After the corrected isotope masses, the number of remaining mu-neutrinos in the 56Fe isotope is 504 pieces, i.e. 9 pcs mu-neutrino in each nucleon.

The value of the made correction of the isotope masses is very insignificant and falls within the millionths of a percent.

It should be noted that all isotopes that fall in the table. 8, before this the mass correction was carried out according to Table. 7, because are isotopes in the third variant of formation and are "noticed" in the failure of the corresponding control check of proton formation. The second correction of the masses of these isotopes is orders of magnitude smaller than the first and there is a "temptation" to slightly reduce the amount of correction of isotope masses in Table. 7, and then the correction of the masses according to Table. 8 would not be needed at all. We found this option not correct.

The exclusion from the isotope cloud of the 2He isotope

Beginning to write this article in 2012, we used the isotope cloud table taken from the resource wikipedia.org, which at that time contained the isotope 2He. The reference mass of the 2He isotope in the wikipedia.org table of the 2012 edition had some "strange" meaning - 2.00 aem. Inclusion of this isotope in the calculation of nr_nucleosynthesis of the cloud of isotopes gives the number of burst mu-neutrinos (relative to the 1H isotope) equal to 87 pcs. In this case, the number of bursting mu-neutrinos with nr_nucleosynthesis of the next 3He isotope becomes negative and it is necessary to apply the second variant of formation of isotope to it with the appropriate mass correction from 3.0160293191 to 3.00866492 cm, which is -0.244%

The isotope 3He is very "widely known", it is stable, its mass has been repeatedly verified, and this correction of its mass is not possible, because does not agree with the experimental data.

In addition, with this correction of the mass of the 3He isotope, only 75 pcs mu-neutrino will burst at the formation of the next 4He isotope. instead of 112 pieces, as for main_stream. As a result, the graph of the binding energy of nucleons in the nucleus (Fig. 4-8) will be highly distorted, which also does not correspond to the experimental data.

Considering all the above, we exclude the isotope 2He (2.00 aem) from the cloud of isotopes. The first isotope in the He isotope group is the 3He isotope (with parent isotope 2H).

Notes:

1. In the general case, in the case of an inconsistency of the mass of isotopes and in the limitations of the S_theory, it is possible to correct the mass of the first isotope, and not the second one, as we did. True, this option would require a recalculation of the reactions of nr_nucleosynthesis in the whole isotope table "backward" with each correction of the mass of an isotope, which is very laborious. Considering that the main task of our work is to consider the "principled" possibility of constructing matter from simples, and not the "revision" of isotope masses, we chose the option of correcting the masses of isotopes "forward" (the next ones, and not the previous ones). At the same time, we have dramatically reduced the amount of computing work and saved time for research and presentation of the main material of our work.

2. But in this particular case (about the isotope 2He) we are talking about one fundamental question: do "isotopes", consisting of only protons (or neutrons alone), or not, form or not? In the fourth chapter we promised to disassemble this issue. Therefore, let us check what the mass of the 2He isotope should be, so that it can be obtained from the 1H isotope, and from it a 3He isotope with a reference mass could be formed.

Applying formula (1) on the contrary, we can calculate the maximum mass of the hypothetical isotope 2He:

2Hemax = 3He -nr + $\nu\mu$-g1 = 2.0073644029 (aem)

Applying the formula (2), we can calculate the minimum mass of the hypothetical isotope 2He:

2Hemin = 1H + nr-6$\nu\mu$ + (u-d) + e- + 6g1 + ΔWPH $\rightarrow$ He = 2.016049066 (a)

The minimum mass of the hypothetical isotope 2He is greater than its maximum mass, i.e. the possible mass range of the hypothetical isotope 2He is negative. We conclude that the 2He isotope does not exist. And since only the 2He isotope could serve as the "ancestor" of the isotope line consisting of only protons, then such a line of isotopes does not exist.

The correctness of our decision is further confirmed by the fact that the 2He isotope is excluded from the isotope table of the Wikipedia.org resource in the wording of 2016.

The possibility of the existence of a line of isotopes consisting of neutrons alone will be considered in the section devoted to the S model of the process of formation of neutron stars.

Conventionality of the made correction of isotope masses

All the corrected masses of isotopes are to some extent conditional. They were conducted on the basis of a control comparison of the number of bursting mu-neutrinos to certain criteria of S_theory. But, the number of bursting mu-neutrinos depends on the mass of the two isotopes-the parent isotope and the isotope formed. The whole "anger" from the discrepancy between the number of bursting mu-neutrinos and the criteria of S_theory, we presented to the isotope formed in the process of nr_nucleosynthesis, correcting its mass.

If the reference mass of the parent isotope is not "ideal", i.e. contains errors in experimental measurements or calculations, then the corrected mass of the formed isotope also contains errors that will affect the results of calculation at the next step of nr_nucleosynthesis (but only one step if the mass of the next isotope is "more or less" accurate)

In general, the work on refinement the masses of isotopes is quite laborious, but very interesting and, as a rule, effective as so relies on a large amount of actual experimental material.

Honestly, at first, when we revealed the first discrepancies between the reference isotope masses for the S_theory criteria, we painfully searched for this explanation and decided what to do, or we were mistaken in the construction of the S_model of the relic neutron, or made mistakes in the S_formulas reflecting certain processes, or made mistakes in calculations. Now we are even "pleased" with these inconsistencies, because they are the consequences of S_theory, the careful verification of which makes it possible to verify experimentally whether S_theory is correct or not correct.

And one more remark (Anthropic).

Made correction mass of isotopes indicates the "shaky" basis of our world - it is worth slightly changing the mass of some isotopes and the "picture" of the world is changing (for example, the most stable isotope may be not the 56Fe isotope, but some other).

And may be everything is just the opposite: in the foundations of our world there is a kind of "precariousness" (variability) in the internal structure of the nuclei of identical isotopes (the number of remaining mu-neutrinos) that allows a certain deviation of physical processes from a deterministic dominant and is a necessary condition for evolutionary development our world.

In the future, we will return to this dilemma.

Calculation of the "rook" - the remaining mu-neutrinos in the "isotope cloud" by one nucleon

The results of calculating the isotope cloud using the horizontal algorithm (HA) are given in the form of a table (diagram) 9 and a graph (Fig. 6_2):

Table. 9 is the Z-N diagram of the cloud of isotopes in the form of cells located at the corresponding Z and N coordinates, with the display in themthe number of mu-neutrinos remaining in the given isotope on average being to one nucleon.

Fig. 6-2 - "Rook" - visualization of the results of calculation of the mu-neutrinos remaining in the isotopes on average by one nucleon in the form of a volumetric plot.

Usually, in all the graphs showing the isotope cloud, the Z axis is directed upward, and the N axis is to the right. On our diagram and graph, the Z axis is directed downwards, and the N axis is to the right. This orientation of the axes is chosen for a better view of the resulting three-dimensional shape of plot ("rooks").

Because of the large amount of information, Table 9, we had to break into six parts, otherwise it would have turned out to be very shallow and figures would not be visible. But the volumetric plot , fit on one sheet in its entirety and gives a general idea of the calculation results.

In Table 9, the number of mu-neutrinos remaining per nucleon is rounded to the first decimal place, values in the range from 9.1 to 9.9 are highlighted by a weak yellow background meaning "fossa". The 56Fe isotope with 9 mu-neutrinos per nucleon is highlighted in bright yellow.

Isotopes illuminated by brown backgrounds refer to isotopes lying on main-stream.

Isotopes highlighted in blue are the first isotopes in groups belonging to the same element of the periodic table, they were formed as a result of the addition of a relic neutron and its transformation into a proton. The remaining isotopes of the groups (rows) were formed as a result of the transformation of the relic neutron into a neutron.

Table 9, (part 1)

эл.	p\n	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
H	1	53.0	50.5	42.3	46.8	49.4	51.2	52.4																				
He	2		52.0	18.3	26.6	31.2	35.3	29.8	33.1	35.8																		
Li	3		52.5	27.2	27.5	26.6	29.4	30.3	33.3	35.5	37.6																	
Be	4		53.0	31.0	26.9	18.3	21.9	22.0	25.2	26.6	29.2	30.8	32.7	34.4														
B	5		53.3	35.7	29.9	22.1	21.3	19.2	21.0	21.9	24.2	25.6	27.8	29.2	30.9	32.3												
C	6			37.8	31.7	23.0	19.9	14.8	16.2	16.2	18.7	19.8	21.9	22.8	24.5	25.5	27.1	28.5										
N	7				33.9	26.3	22.3	16.9	15.9	14.9	16.9	17.5	19.0	19.6	21.1	21.7	23.1	24.3	25.8	27.2								
O	8					28.7	24.0	17.6	15.7	13.1	14.5	14.6	15.8	16.0	17.1	17.4	18.6	19.5										
F	9						26.2	20.5	18.2	15.3	15.0	14.4	14.9	14.9	15.6	15.8	16.8	17.5	18.9	20.1	21.6	22.7	24.0	25.1				
Ne	10							22.5	19.8	16.2	15.2	12.9	13.4	13.0	13.8	13.7	14.6	15.2	16.6	17.4	18.6	19.4	20.7	21.6	22.8	23.8		
Na	11								21.7	18.2	16.5	14.1	13.5	12.6	13.0	12.9	13.5	13.9	14.8	15.5	16.6	17.3	18.3	19.2	20.4	21.3	22.4	23.3
Mg	12								23.5	19.3	17.4	14.5	13.4	11.7	12.0	11.5	12.0	12.1	13.1	13.5	14.5	15.0	16.0	16.6	17.7	18.4	19.5	20.2
Al	13									20.9	19.0	16.2	14.6	12.8	12.2	11.3	11.6	11.5	12.1	12.4	13.1	13.6	14.6	15.1	16.0	16.6	17.4	18.1
Si	14									22.3	20.0	17.0	15.4	13.2	12.3	10.6	10.8	10.5	10.9	10.9	11.6	11.8	12.8	13.2	14.1	14.5	15.4	15.9
P	15										21.5	18.6	16.8	14.5	13.3	11.6	11.1	10.5	10.8	10.6	11.0	11.1	11.9	12.2	12.9	13.3	14.0	14.4
S	16											19.8	18.0	15.4	14.0	12.1	11.4	10.4	10.5	10.1	10.4	10.3	11.0	11.1	11.8	11.9	12.5	12.8
Cl	17												19.3	17.0	15.4	13.4	12.4	11.3	10.9	10.3	10.4	10.2	10.7	10.8	11.2	11.4	11.8	12.0
Ar	18													18.1	16.5	14.2	13.1	11.8	11.2	10.2	10.3	9.9	10.3	10.2	10.6	10.5	11.0	11.0
K	19														17.7	15.7	14.4	12.9	12.1	11.1	10.7	10.1	10.3	10.2	10.4	10.3	10.6	10.6
Ca	20															16.6	15.3	13.7	12.8	11.6	11.0	10.1	10.2	9.9	10.0	9.8	10.0	9.9
Sc	21																16.4	15.0	13.9	12.7	11.9	11.0	10.6	10.2	10.2	9.9	10.0	9.8
Ti	22																	15.8	14.8	13.4	12.6	11.5	11.0	10.1	10.1	9.6	9.7	9.4
V	23																		15.8	14.6	13.6	12.4	11.8	10.9	10.4	10.0	9.8	9.6
Cr	24																			15.4	14.3	13.0	12.4	11.3	10.8	10.0	9.8	9.4
Mn	25																				15.3	14.0	13.2	12.1	11.4	10.6	10.2	9.7
Fe	26																				16.1	14.7	13.8	12.6	12.0	11.0	10.5	9.7
Co	27																					15.5	14.8	13.6	12.8	11.8	11.2	10.4
Ni	28																					16.3	15.6	14.2	13.4	12.3	11.7	10.8
Cu	29																								14.2	13.3	12.5	11.6
Zn	30																									13.9	13.2	12.2
Ga	31																										13.9	13.1
Ge	32																											13.8

Table 9, (part 2)

эл.	p\n	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53
Mg	12	21.3	22.1																									
Al	13	19.2	19.9	20.9																								
Si	14	17.0	17.5	18.5	19.3																							
P	15	15.3	15.9	16.7	17.3	18.2																						
S	16	13.6	14.0	14.7	15.2	16.1	16.6	17.5																				
Cl	17	12.5	12.8	13.3	13.9	14.6	15.2	15.9	16.6																			
Ar	18	11.4	11.5	12.1	12.4	13.1	13.6	14.3	14.8	15.6																		
K	19	10.8	10.9	11.4	11.7	12.4	12.8	13.4	13.9	14.6	15.2																	
Ca	20	10.1	10.0	10.5	10.8	11.3	11.7	12.3	12.7	13.4	13.9	14.5																
Sc	21	9.9	9.8	10.1	10.4	10.8	11.2	11.6	12.1	12.6	13.1	13.7	14.2	14.8														
Ti	22	9.6	9.4	9.7	9.8	10.2	10.4	10.9	11.3	11.9	12.2	12.8	13.2	13.7	14.1	14.7												
V	23	9.6	9.4	9.6	9.7	10.0	10.2	10.6	10.8	11.3	11.7	12.1	12.5	13.0	13.3	13.8	14.2											
Cr	24	9.5	9.2	9.3	9.3	9.6	9.7	10.1	10.2	10.7	10.9	11.4	11.6	12.1	12.3	12.8	13.1	13.6										
Mn	25	9.6	9.3	9.3	9.2	9.4	9.5	9.7	9.9	10.2	10.4	10.8	11.0	11.4	11.7	12.1	12.4	12.8	13.1									
Fe	26	9.6	9.2	9.2	9.0	9.2	9.1	9.3	9.4	9.7	9.8	10.2	10.3	10.8	10.9	11.3	11.6	12.0	12.3	12.7	13.0							
Co	27	10.0	9.5	9.4	9.2	9.3	9.2	9.3	9.3	9.6	9.6	9.9	10.0	10.4	10.6	10.9	11.1	11.5	11.7	12.1	12.4	12.8	13.0					
Ni	28	10.3	9.6	9.5	9.2	9.2	9.1	9.2	9.1	9.3	9.3	9.5	9.6	9.8	10.0	10.3	10.5	10.8	11.0	11.4	11.6	11.9	12.1	12.5	12.7			
Cu	29	11.0	10.3	10.0	9.7	9.6	9.4	9.4	9.3	9.4	9.3	9.5	9.5	9.8	9.8	10.1	10.2	10.5	10.7	10.9	11.1	11.4	11.7	12.0	12.2	12.7		
Zn	30	11.6	10.8	10.4	9.9	9.8	9.5	9.5	9.3	9.4	9.2	9.4	9.4	9.6	9.6	9.9	9.9	10.2	10.2	10.5	10.6	10.9	11.1	11.4	11.6	12.0	12.3	12.8
Ga	31	12.4	11.6	11.1	10.6	10.3	10.0	9.9	9.6	9.7	9.5	9.6	9.5	9.6	9.6	9.8	9.8	10.0	10.1	10.3	10.4	10.6	10.8	11.1	11.2	11.6	11.9	12.3
Ge	32	13.1	12.2	11.7	11.0	10.7	10.2	10.1	9.8	9.8	9.5	9.6	9.4	9.6	9.5	9.7	9.6	9.8	9.8	10.0	10.1	10.3	10.4	10.6	10.8	11.1	11.3	11.7
As	33	13.8	13.1	12.5	11.8	11.4	10.8	10.6	10.2	10.1	9.9	9.9	9.7	9.8	9.6	9.7	9.7	9.8	9.8	9.9	9.9	10.1	10.2	10.4	10.5	10.8	11.0	11.4
Se	34					12.0	11.3	11.0	10.5	10.4	10.0	10.0	9.8	9.8	9.6	9.7	9.6	9.7	9.6	9.8	9.7	9.9	9.9	10.1	10.1	10.4	10.6	10.9
Br	35						12.0	11.7	11.1	10.8	10.5	10.4	10.1	10.1	9.9	9.9	9.8	9.8	9.7	9.8	9.8	9.9	9.8	10.0	10.0	10.3	10.5	10.7
Kr	36							12.2	11.5	11.2	10.7	10.6	10.3	10.2	9.9	9.9	9.7	9.8	9.7	9.7	9.6	9.7	9.7	9.8	9.7	10.0	10.1	10.4
Rb	37								12.1	11.9	11.3	11.0	10.7	10.5	10.3	10.2	10.0	10.0	9.9	9.9	9.8	9.8	9.7	9.8	9.7	9.9	10.1	10.3
Sr	38									12.4	11.8	11.4	10.9	10.7	10.4	10.4	10.1	10.1	9.9	9.9	9.7	9.8	9.6	9.7	9.6	9.8	9.8	10.0
Y	39											12.0	11.5	11.1	10.8	10.7	10.4	10.4	10.2	10.1	9.9	9.9	9.8	9.8	9.6	9.8	9.8	10.0
Zr	40												11.8	11.5	11.0	10.9	10.6	10.5	10.2	10.2	10.0	10.0	9.8	9.8	9.6	9.7	9.8	9.9
Nb	41														11.6	11.3	11.0	10.8	10.6	10.5	10.3	10.2	10.0	9.9	9.8	9.9	9.9	10.0
Mo	42															11.7	11.2	11.0	10.8	10.6	10.4	10.3	10.1	10.0	9.8	9.9	9.8	9.9
Tc	43																11.7	11.4	11.1	11.0	10.7	10.6	10.3	10.2	10.0	10.1	10.0	10.1
Ru	44																	11.8	11.4	11.2	10.9	10.7	10.5	10.4	10.1	10.1	10.1	10.1
Rh	45																		11.9	11.6	11.3	11.1	10.8	10.6	10.4	10.4	10.3	10.3
Pd	46																			12.0	11.5	11.3	11.0	10.8	10.6	10.5	10.4	10.4
Ag	47																				12.0	11.7	11.4	11.2	10.9	10.8	10.7	10.7
Cd	48																					12.1	11.6	11.4	11.1	11.0	10.8	10.8
In	49																						12.1	11.8	11.5	11.4	11.2	11.1
Sn	50																							12.2	11.7	11.6	11.4	11.3
Sb	51																										11.8	11.7
Te	52																											12.1

Table 9, (part 3)

эл.	p\n	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
Ga	31	12.6	13.0																									
Ge	32	12.0	12.4	12.7	13.1																							
As	33	11.6	11.9	12.2	12.6	12.9	13.3																					
Se	34	11.1	11.5	11.7	12.1	12.4	12.7	13.0																				
Br	35	10.9	11.2	11.4	11.8	12.0	12.4	12.6	13.0	13.2																		
Kr	36	10.5	10.8	11.0	11.4	11.6	11.9	12.1	12.5	12.7	13.0	13.2																
Rb	37	10.4	10.7	10.8	11.1	11.3	11.7	11.9	12.1	12.4	12.6	12.8	13.1															
Sr	38	10.2	10.4	10.5	10.8	11.0	11.2	11.4	11.7	11.9	12.1	12.3	12.6	12.8	13.2													
Y	39	10.1	10.3	10.4	10.6	10.8	11.0	11.2	11.4	11.6	11.8	12.0	12.2	12.4	12.7	13.0	13.2											
Zr	40	9.9	10.1	10.2	10.4	10.5	10.8	10.9	11.1	11.2	11.5	11.6	11.8	12.0	12.3	12.5	12.7	12.9										
Nb	41	10.0	10.2	10.2	10.4	10.5	10.7	10.8	11.0	11.1	11.3	11.4	11.7	11.8	12.1	12.2	12.5	12.7	12.9	13.1								
Mo	42	9.9	10.1	10.1	10.3	10.3	10.5	10.6	10.8	10.9	11.1	11.2	11.4	11.5	11.7	11.9	12.1	12.3	12.5	12.7	12.9							
Tc	43	10.1	10.2	10.2	10.3	10.3	10.5	10.6	10.7	10.8	11.0	11.0	11.2	11.4	11.6	11.7	11.9	12.0	12.3	12.4	12.6	12.8	13.1					
Ru	44	10.1	10.2	10.1	10.2	10.2	10.4	10.4	10.6	10.6	10.8	10.8	11.0	11.1	11.3	11.4	11.6	11.7	12.0	12.1	12.3	12.5	12.7	12.8				
Rh	45	10.2	10.3	10.2	10.3	10.3	10.4	10.4	10.6	10.6	10.7	10.8	10.9	11.0	11.2	11.3	11.5	11.6	11.8	11.9	12.1	12.2	12.4	12.6	12.8			
Pd	46	10.3	10.3	10.3	10.3	10.3	10.4	10.4	10.5	10.5	10.6	10.7	10.8	10.8	11.0	11.1	11.3	11.3	11.5	11.6	11.8	11.9	12.1	12.2	12.4	12.5		
Ag	47	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.6	10.6	10.7	10.7	10.8	10.9	11.0	11.0	11.2	11.3	11.4	11.5	11.7	11.8	12.0	12.0	12.2	12.3	12.5	12.6
Cd	48	10.6	10.7	10.5	10.6	10.5	10.5	10.5	10.6	10.5	10.6	10.6	10.7	10.7	10.9	10.9	11.0	11.1	11.2	11.3	11.4	11.5	11.7	11.7	11.9	12.0	12.2	12.3
In	49	10.9	10.9	10.8	10.8	10.7	10.7	10.6	10.7	10.6	10.7	10.7	10.8	10.8	10.9	10.9	11.0	11.0	11.2	11.2	11.3	11.4	11.5	11.6	11.7	11.8	11.9	12.0
Sn	50	11.1	11.1	10.9	10.9	10.8	10.8	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.8	10.8	10.9	10.9	11.0	11.0	11.2	11.2	11.3	11.4	11.5	11.6	11.7	11.8
Sb	51	11.5	11.5	11.3	11.2	11.1	11.1	11.0	11.0	10.9	10.9	10.9	10.9	10.9	10.9	10.9	11.0	11.0	11.1	11.1	11.2	11.2	11.3	11.4	11.5	11.5	11.7	11.7
Te	52	11.8	11.8	11.5	11.5	11.3	11.3	11.2	11.2	11.0	11.1	11.0	11.0	10.9	11.0	10.9	11.0	11.0	11.1	11.1	11.2	11.2	11.3	11.3	11.4	11.4	11.5	11.6
I	53		12.2	12.0	11.9	11.7	11.6	11.5	11.4	11.3	11.3	11.2	11.2	11.1	11.2	11.1	11.1	11.1	11.2	11.1	11.2	11.2	11.3	11.3	11.4	11.4	11.5	11.5
Xe	54			12.3	12.2	11.9	11.9	11.7	11.7	11.5	11.5	11.3	11.3	11.2	11.2	11.2	11.2	11.1	11.2	11.2	11.2	11.2	11.3	11.3	11.4	11.4	11.5	11.5
Cs	55				12.6	12.4	12.3	12.0	12.0	11.8	11.7	11.6	11.6	11.5	11.5	11.4	11.4	11.3	11.3	11.3	11.3	11.3	11.4	11.4	11.4	11.4	11.5	11.5
Ba	56					12.6	12.5	12.3	12.2	12.0	11.9	11.8	11.7	11.6	11.6	11.5	11.5	11.4	11.4	11.3	11.4	11.3	11.4	11.4	11.4	11.4	11.5	11.5
La	57							12.6	12.6	12.3	12.3	12.1	12.0	11.9	11.8	11.7	11.7	11.6	11.6	11.5	11.6	11.5	11.5	11.5	11.6	11.5	11.6	11.6
Ce	58								12.8	12.6	12.5	12.3	12.2	12.0	12.0	11.8	11.8	11.7	11.7	11.6	11.6	11.6	11.6	11.5	11.6	11.5	11.6	11.6
Pr	59									12.9	12.8	12.6	12.5	12.4	12.3	12.1	12.1	12.0	12.0	11.9	11.8	11.8	11.8	11.7	11.7	11.7	11.7	11.7
Nd	60											12.9	12.8	12.6	12.5	12.3	12.3	12.1	12.1	12.0	12.0	11.9	11.9	11.8	11.8	11.7	11.8	11.7
Pm	61												13.1	12.9	12.8	12.7	12.6	12.4	12.4	12.2	12.2	12.1	12.1	12.0	12.0	11.9	11.9	11.9
Sm	62													13.2	13.1	12.9	12.8	12.6	12.6	12.4	12.4	12.3	12.2	12.1	12.1	12.0	12.0	12.0
Eu	63														13.4	13.2	13.1	12.9	12.9	12.7	12.7	12.5	12.5	12.4	12.3	12.3	12.2	12.1
Gd	64																	13.2	13.1	12.9	12.9	12.7	12.7	12.5	12.5	12.4	12.3	12.2
Tb	65																		13.4	13.2	13.2	13.0	12.9	12.8	12.7	12.6	12.6	12.5
Dy	66																			13.5	13.4	13.2	13.1	13.0	12.9	12.8	12.7	12.6
Ho	67																				13.7	13.5	13.4	13.3	13.2	13.1	13.0	12.9
Er	68																						13.7	13.5	13.4	13.2	13.1	13.0
Tm	69																							13.8	13.7	13.5	13.4	13.3
Yb	70																									13.8	13.7	13.5
Lu	71																										13.9	13.8

Table 9, (part 4)

эл.	p\n	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107
Ag	47	12.8	13.0																									
Cd	48	12.5	12.6	12.9	13.1																							
In	49	12.2	12.3	12.6	12.8	13.0	13.2																					
Sn	50	11.9	12.0	12.2	12.4	12.7	12.9	13.1																				
Sb	51	11.8	11.9	12.1	12.3	12.6	12.8	13.0	13.2																			
Te	52	11.7	11.8	12.0	12.1	12.4	12.5	12.8	12.9	13.2	13.3																	
I	53	11.7	11.7	11.9	12.1	12.2	12.4	12.6	12.8	13.0	13.2	13.4																
Xe	54	11.6	11.6	11.8	11.9	12.1	12.3	12.5	12.6	12.8	13.0	13.2	13.3	13.5														
Cs	55	11.6	11.6	11.8	11.9	12.1	12.2	12.4	12.5	12.7	12.9	13.0	13.2	13.4	13.5	13.7	13.9											
Ba	56	11.6	11.6	11.7	11.8	12.0	12.1	12.3	12.4	12.6	12.7	12.9	13.0	13.2	13.3	13.5	13.6	13.8										
La	57	11.6	11.6	11.8	11.9	12.0	12.1	12.3	12.4	12.5	12.6	12.8	12.9	13.0	13.2	13.3	13.5	13.6	13.8									
Ce	58	11.6	11.6	11.7	11.8	11.9	12.0	12.2	12.2	12.4	12.5	12.6	12.7	12.9	13.0	13.1	13.2	13.4	13.5	13.7								
Pr	59	11.7	11.7	11.8	11.9	12.0	12.1	12.2	12.3	12.4	12.5	12.6	12.7	12.8	12.9	13.1	13.2	13.3	13.4	13.6	13.7							
Nd	60	11.8	11.7	11.8	11.9	12.0	12.0	12.2	12.2	12.3	12.4	12.5	12.6	12.7	12.8	12.9	13.0	13.1	13.2	13.4	13.5	13.7						
Pm	61	11.9	11.8	11.9	12.0	12.1	12.1	12.2	12.3	12.4	12.4	12.5	12.5	12.6	12.7	12.8	12.9	13.1	13.2	13.3	13.4	13.5	13.7					
Sm	62	12.0	11.9	12.0	12.0	12.1	12.1	12.2	12.3	12.4	12.4	12.5	12.5	12.6	12.7	12.8	12.8	13.0	13.1	13.2	13.3	13.4	13.5	13.7				
Eu	63	12.1	12.1	12.1	12.1	12.2	12.2	12.3	12.3	12.4	12.4	12.5	12.5	12.6	12.7	12.8	12.8	12.9	13.0	13.1	13.2	13.3	13.4	13.6	13.7			
Gd	64	12.2	12.1	12.2	12.2	12.2	12.3	12.3	12.3	12.4	12.4	12.5	12.5	12.6	12.6	12.7	12.8	12.9	12.9	13.0	13.1	13.2	13.3	13.5	13.6	13.7		
Tb	65	12.4	12.3	12.4	12.4	12.4	12.4	12.5	12.5	12.5	12.5	12.6	12.6	12.6	12.7	12.7	12.8	12.9	12.9	13.0	13.1	13.2	13.3	13.4	13.5	13.6	13.7	
Dy	66	12.6	12.4	12.5	12.4	12.5	12.5	12.5	12.5	12.6	12.5	12.6	12.6	12.7	12.7	12.7	12.7	12.8	12.9	13.0	13.0	13.1	13.2	13.3	13.4	13.5	13.6	13.7
Ho	67	12.8	12.7	12.7	12.7	12.7	12.6	12.7	12.7	12.7	12.7	12.7	12.7	12.8	12.7	12.8	12.8	12.9	12.9	13.0	13.0	13.1	13.2	13.3	13.3	13.5	13.5	13.7
Er	68	12.9	12.8	12.8	12.8	12.8	12.7	12.8	12.7	12.8	12.7	12.8	12.7	12.8	12.8	12.8	12.8	12.9	12.9	13.0	13.0	13.1	13.1	13.2	13.3	13.4	13.4	13.6
Tm	69	13.2	13.1	13.1	13.0	13.0	13.0	13.0	12.9	12.9	12.9	12.9	12.9	12.9	12.9	12.9	12.9	13.0	13.0	13.0	13.1	13.1	13.2	13.2	13.3	13.4	13.4	13.5
Yb	70	13.4	13.2	13.2	13.2	13.2	13.1	13.1	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.1	13.1	13.2	13.2	13.2	13.3	13.4	13.4	13.5
Lu	71	13.7	13.5	13.5	13.4	13.4	13.3	13.3	13.2	13.2	13.2	13.2	13.2	13.2	13.1	13.2	13.1	13.2	13.1	13.2	13.2	13.2	13.2	13.3	13.3	13.4	13.4	13.5
Hf	72	13.9	13.7	13.7	13.6	13.6	13.5	13.5	13.4	13.4	13.3	13.3	13.2	13.3	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.3	13.3	13.3	13.3	13.4	13.4	13.5
Ta	73		14.0	14.0	13.9	13.8	13.7	13.7	13.6	13.6	13.5	13.5	13.4	13.4	13.4	13.4	13.4	13.4	13.4	13.4	13.4	13.4	13.4	13.4	13.4	13.5	13.5	13.6
W	74				14.1	14.0	13.9	13.9	13.8	13.7	13.7	13.6	13.6	13.6	13.5	13.5	13.5	13.5	13.4	13.5	13.4	13.5	13.4	13.5	13.5	13.5	13.5	13.6
Re	75					14.3	14.2	14.1	14.0	14.0	13.9	13.9	13.8	13.8	13.7	13.7	13.6	13.7	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.7
Os	76						14.4	14.3	14.2	14.2	14.1	14.0	13.9	13.9	13.8	13.8	13.8	13.8	13.7	13.7	13.7	13.7	13.6	13.7	13.7	13.7	13.7	13.7
Ir	77							14.6	14.5	14.5	14.3	14.3	14.2	14.2	14.1	14.1	14.0	14.0	13.9	13.9	13.8	13.9	13.8	13.8	13.8	13.8	13.8	13.8
Pt	78								14.7	14.7	14.5	14.5	14.4	14.4	14.3	14.2	14.1	14.1	14.1	14.1	14.0	14.0	13.9	14.0	13.9	13.9	13.9	13.9
Au	79										14.8	14.8	14.6	14.6	14.5	14.5	14.4	14.4	14.3	14.3	14.2	14.2	14.1	14.1	14.1	14.1	14.1	14.1
Hg	80											15.0	14.8	14.8	14.7	14.7	14.5	14.5	14.4	14.4	14.3	14.3	14.2	14.3	14.2	14.2	14.1	14.2
Tl	81															14.9	14.8	14.8	14.7	14.6	14.5	14.5	14.4	14.4	14.4	14.4	14.3	14.3
Pb	82																15.0	15.0	14.8	14.8	14.7	14.7	14.6	14.6	14.5	14.5	14.4	14.4
Bi	83																					14.9	14.9	14.8	14.8	14.7	14.7	14.7
Po	84																								14.9	14.9	14.8	14.8

Table 9, (parts 5 and 6)

эл.	p\n	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134
Ho	67	13.8																										
Er	68	13.6	13.8																									
Tm	69	13.6	13.7	13.8																								
Yb	70	13.6	13.7	13.7	13.9																							
Lu	71	13.6	13.7	13.7	13.8	13.9	14.0																					
Hf	72	13.6	13.6	13.7	13.8	13.8	14.0	14.0	14.1	14.2																		
Ta	73	13.6	13.7	13.7	13.8	13.9	14.0	14.0	14.1	14.2	14.3																	
W	74	13.6	13.7	13.7	13.8	13.8	13.9	14.0	14.1	14.1	14.2	14.2																
Re	75	13.7	13.7	13.7	13.8	13.8	13.9	14.0	14.0	14.1	14.2	14.2	14.3															
Os	76	13.7	13.8	13.8	13.8	13.8	13.9	13.9	14.0	14.0	14.1	14.2	14.2	14.3														
Ir	77	13.8	13.9	13.9	13.9	13.9	14.0	14.0	14.0	14.1	14.1	14.2	14.2	14.3	14.4	14.4												
Pt	78	13.9	14.0	13.9	14.0	14.0	14.0	14.0	14.1	14.1	14.2	14.2	14.2	14.3	14.3	14.4	14.5	14.5										
Au	79	14.0	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.2	14.2	14.3	14.3	14.3	14.4	14.4	14.5	14.5	14.6								
Hg	80	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.2	14.1	14.2	14.2	14.2	14.2	14.3	14.3	14.4	14.4	14.5	14.5	14.7	14.7	14.9	15.0				
Tl	81	14.3	14.3	14.3	14.3	14.2	14.3	14.2	14.3	14.3	14.3	14.3	14.3	14.3	14.4	14.4	14.4	14.4	14.5	14.5	14.7	14.7	14.9	14.9	15.1			
Pb	82	14.4	14.4	14.3	14.4	14.3	14.3	14.3	14.3	14.3	14.3	14.3	14.3	14.3	14.4	14.4	14.4	14.4	14.5	14.5	14.6	14.7	14.8	14.9	15.0	15.1	15.2	
Bi	83	14.6	14.6	14.5	14.5	14.5	14.5	14.5	14.5	14.4	14.5	14.4	14.5	14.5	14.5	14.5	14.5	14.5	14.6	14.6	14.7	14.8	14.9	14.9	15.1	15.1	15.2	15.3
Po	84	14.7	14.7	14.7	14.7	14.6	14.6	14.6	14.6	14.5	14.6	14.5	14.6	14.5	14.6	14.6	14.6	14.6	14.6	14.6	14.7	14.8	14.9	15.0	15.1	15.1	15.2	15.3
At	85	14.9	14.9	14.9	14.9	14.8	14.8	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.8	14.9	15.0	15.0	15.1	15.2	15.3	15.3
Rn	86		15.1	15.0	15.0	14.9	14.9	14.9	14.9	14.8	14.8	14.8	14.8	14.8	14.8	14.8	14.8	14.8	14.8	14.8	14.9	14.9	15.0	15.1	15.2	15.2	15.3	15.3
Fr	87					15.1	15.1	15.1	15.0	15.0	15.0	15.0	15.0	14.9	14.9	14.9	14.9	14.9	14.9	14.9	15.0	15.0	15.1	15.1	15.2	15.3	15.3	15.4
Ra	88							15.2	15.2	15.1	15.1	15.1	15.1	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.1	15.1	15.2	15.2	15.3	15.3	15.4	15.4
Ac	89										15.3	15.3	15.3	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.3	15.3	15.4	15.4	15.4	15.5
Th	90												15.4	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.4	15.4	15.4	15.4	15.5	15.5
Pa	91														15.5	15.5	15.5	15.4	15.4	15.4	15.5	15.5	15.5	15.5	15.5	15.6	15.6	15.6
U	92																		15.5	15.5	15.6	15.6	15.6	15.6	15.6	15.6	15.7	15.7
Np	93																									15.8	15.8	15.8
Pu	94																											15.9

эл.	p\n	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160
Bi	83	15.4																									
Po	84	15.4	15.5																								
At	85	15.4	15.5	15.6	15.7																						
Rn	86	15.4	15.5	15.6	15.6	15.7	15.8	15.9	16.0	16.1																	
Fr	87	15.5	15.5	15.6	15.6	15.7	15.8	15.9	15.9	16.0	16.1	16.2															
Ra	88	15.5	15.5	15.6	15.6	15.7	15.8	15.9	15.9	16.0	16.1	16.1	16.2														
Ac	89	15.5	15.6	15.6	15.7	15.7	15.8	15.9	15.9	16.0	16.0	16.1	16.2	16.3													
Th	90	15.6	15.6	15.7	15.7	15.7	15.8	15.8	15.9	16.0	16.0	16.1	16.1	16.2	16.3												
Pa	91	15.7	15.7	15.7	15.7	15.8	15.8	15.9	15.9	16.0	16.0	16.1	16.2	16.2	16.3	16.4											
U	92	15.7	15.7	15.8	15.8	15.8	15.8	15.9	15.9	16.0	16.0	16.1	16.1	16.2	16.3	16.3	16.4										
Np	93	15.8	15.8	15.8	15.9	15.9	15.9	16.0	16.0	16.0	16.1	16.1	16.2	16.2	16.3	16.4	16.4	16.5									
Pu	94	15.9	15.9	15.9	15.9	15.9	16.0	16.0	16.0	16.1	16.1	16.1	16.2	16.2	16.3	16.3	16.4	16.5	16.5	16.6							
Am	95		16.0	16.0	16.0	16.0	16.0	16.1	16.1	16.1	16.2	16.2	16.2	16.3	16.3	16.4	16.4	16.5	16.5	16.6	16.7						
Cm	96			16.1	16.1	16.1	16.1	16.1	16.1	16.2	16.2	16.2	16.3	16.3	16.3	16.4	16.4	16.5	16.5	16.6	16.7	16.7	16.8				
Bk	97				16.2	16.2	16.2	16.2	16.2	16.3	16.3	16.3	16.3	16.4	16.4	16.4	16.5	16.5	16.6	16.6	16.7	16.7	16.8	16.9			
Cf	98					16.3	16.3	16.3	16.3	16.3	16.3	16.4	16.4	16.4	16.4	16.5	16.5	16.6	16.6	16.6	16.7	16.7	16.8	16.9	16.9		
Es	99							16.4	16.4	16.5	16.4	16.5	16.5	16.5	16.5	16.6	16.6	16.6	16.6	16.7	16.7	16.8	16.8	16.9	16.9	17.0	
Fm	100								16.5	16.5	16.5	16.6	16.6	16.6	16.6	16.6	16.6	16.7	16.7	16.7	16.8	16.8	16.9	16.9	17.0	17.0	17.1

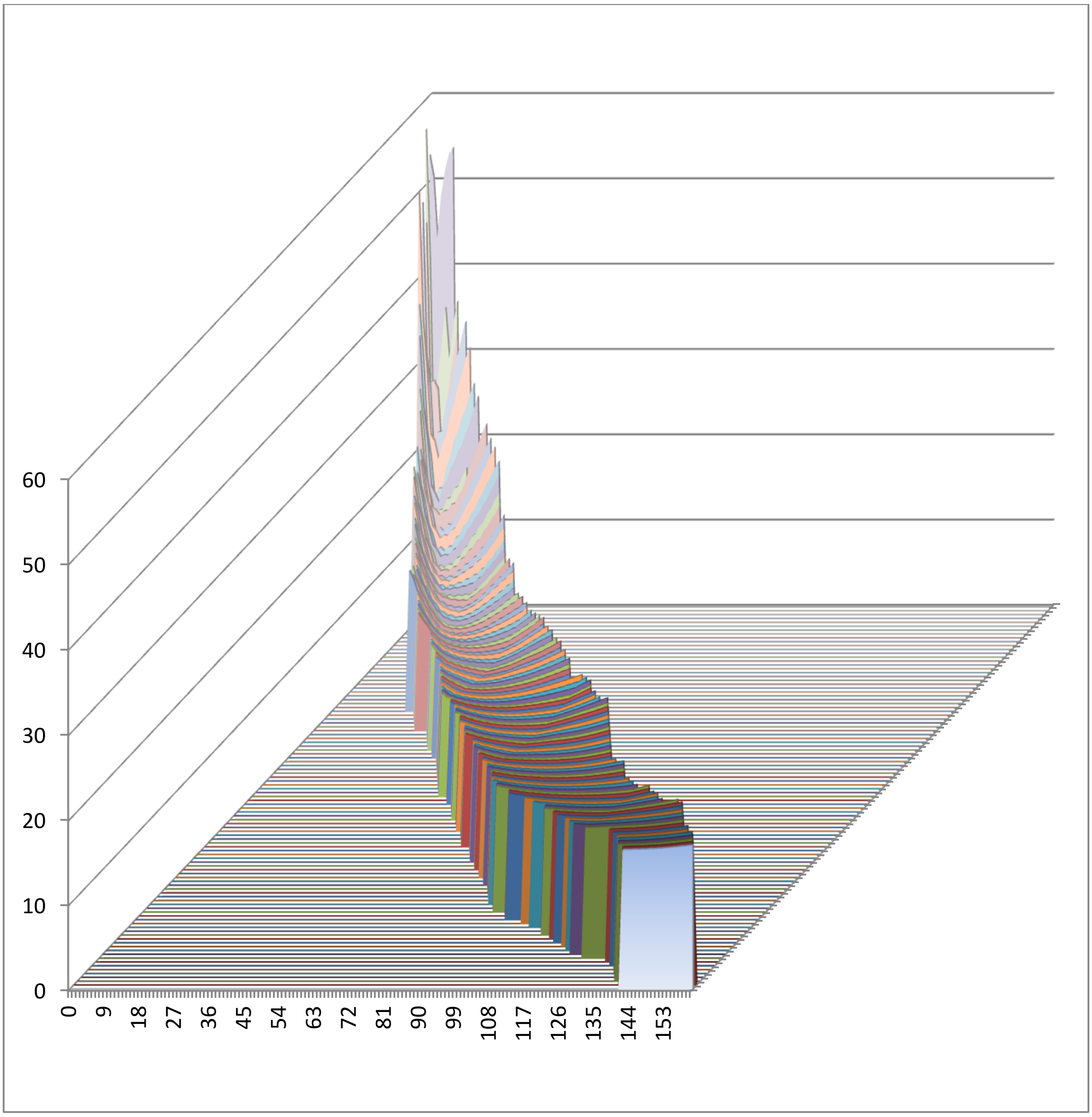


Fig. 6_2 "Rook" - visualization of the results of calculation of the mu-neutrinos remaining in the isotopes on average by one nucleon in the form of a volumetric graph (view from the "stern").

Unfortunately, it is not possible to map isotopes related to main-stream on a volumetric graph, but from a numerical graph (table) it can be seen that isotopes of main-stream is the isotopes with the minimum amount of the remaining mu-neutrinos on any of the coordinates or on any diagonal of the table, on which isotopes with an equal number of nucleons have gathered. In fact, this is the "keel of the boat", on which stable isotopes have gathered.

All unstable isotopes are located on the sides of this "keel" and have in their composition a larger number of remaining mu-neutrinos (!), Which are in a clamped state and periodically spontaneously burst, which leads to the reactions of β-_ decay or β+_ decay and the movement of the newly formed isotopes to the "keel" or to the "keel" side. The isotopes located above (to the right) from the "keel" (main-stream) are subject to β-_ decay, the isotopes located below (left) from the "keel" (main-stream) are subject to β+_ decay.

The "keel of the boat" and the whole "rook" also have a "deflection" along the longitudinal axis of the "boat", forming a depression in the form of a "pit" in the vicinity of the 56Fe isotope, these isotopes in Table. are tinted in yellow. The isotopes that are formed during the reactions of thermonuclear fusion and the reactions of nuclear decay are "roll down" to the side of this "pit" from two sides (from the "nose of the boat" and from the "stern of the boat"). These features of the shape of the "boat" can be see by looking at it from the side of the "side" (see Figure 6_3).

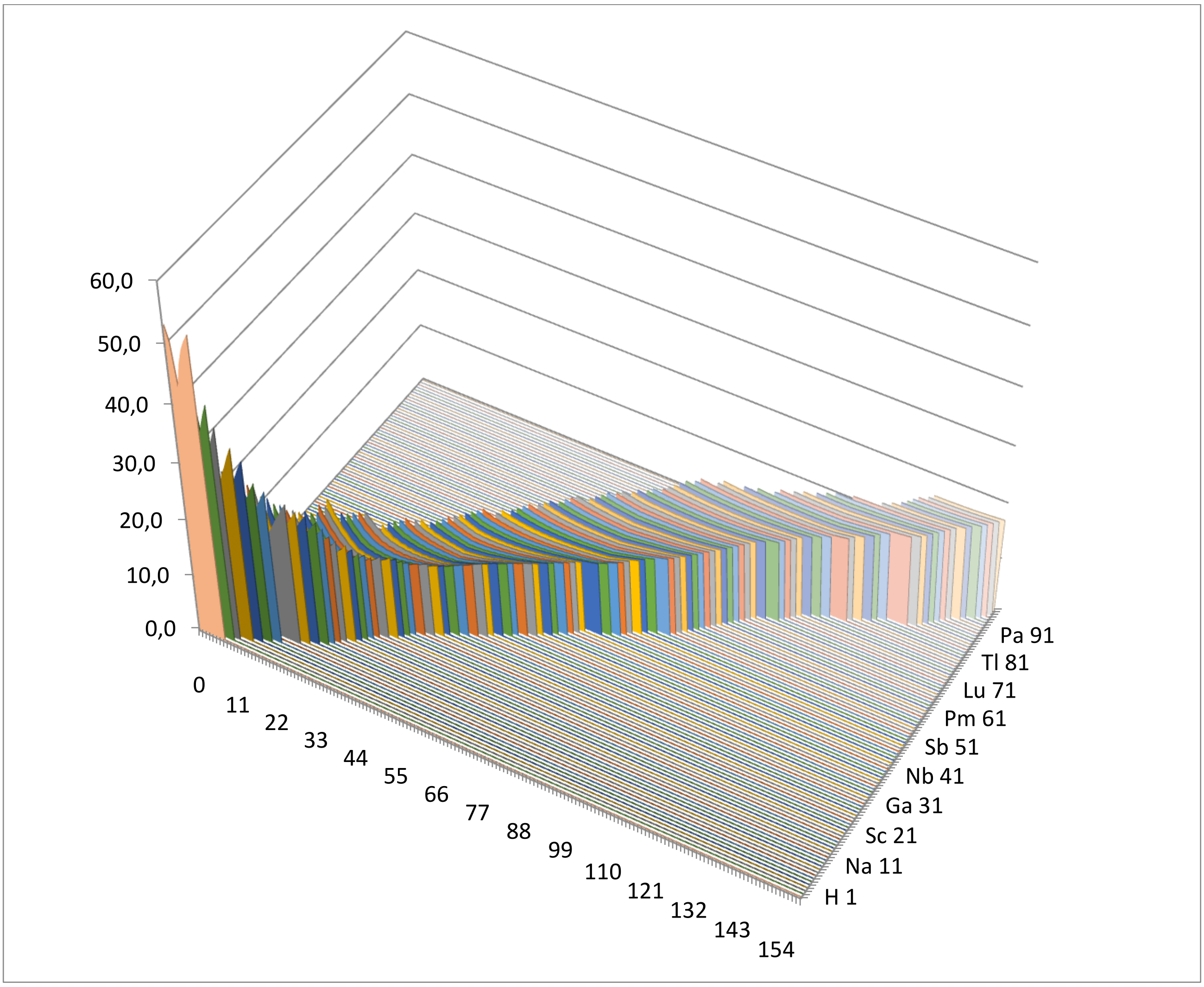


Fig. 6_3. View of the "rook" from the side "rook"

Unfortunately, the volume graph does not show that the nose of the "rook" is not cut out smoothly, but has "dips", characteristic for thermonuclear reactions. To display these "dips", we give the "rook" sections that represent the minimum values of the remaining mu-neutrinos by one nucleon in rows (coordinate Z) and columns (coordinate N).

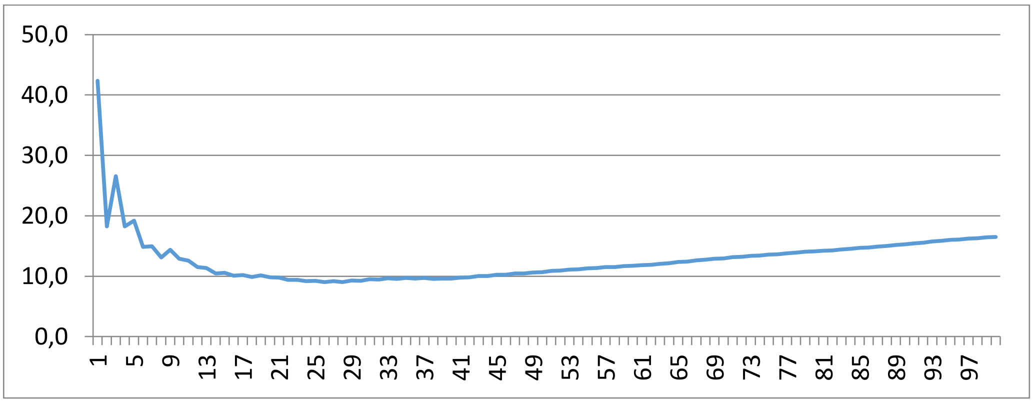


Fig. 6_4. Section of the rook, showing the minimum values of the remaining mu-neutrinos in rows (coord. Z)

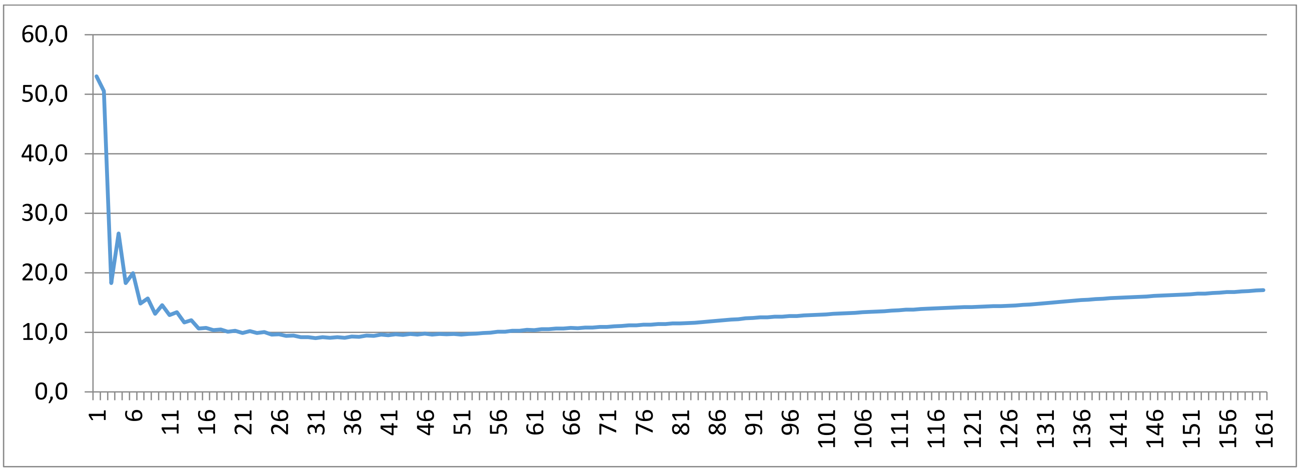


Fig. 6_5. Section of the rook, showing the minimum values of the remaining mu-neutrinos in columns (coordinate N)

In fact, the "rook" is an inverted three-dimensional graph of the specific binding energy of nucleons in isotopes, which clearly reflects the direction and possible result of all nuclear reactions.

In one of the following chapters, we will conduct an S-analysis of all types of "modern" nuclear reactions based on the "rook" received by us.

The "rook" presented by us is the main result of our calculations. Because of space savings, we do not give here the calculation results and the graphs of other components of the isotope nuclei (the number of bursts and remaining mu neutrinos, the change in the mass of the "quark hoop" and gluons, the mass of the electron-antineutrinos and gamma rays emitted from the nucleus, etc.). Moreover, all these components (parameters) are calculated by us in three sections: by the step of nr_nucleosynthesis, all by the isotope from the beginning of nr_nucleosynthesis and by one nucleon of the isotope.

However, considering that all these parameters, including the rook, are the result of the mu-neutrino bursting process, we can not dispense with presenting to you a three-dimensional graph of the number of burst mu-neutrinos in the formation of each isotope of cloud by the step of nr_nucleosynthesis - see Fig. . 6_6.

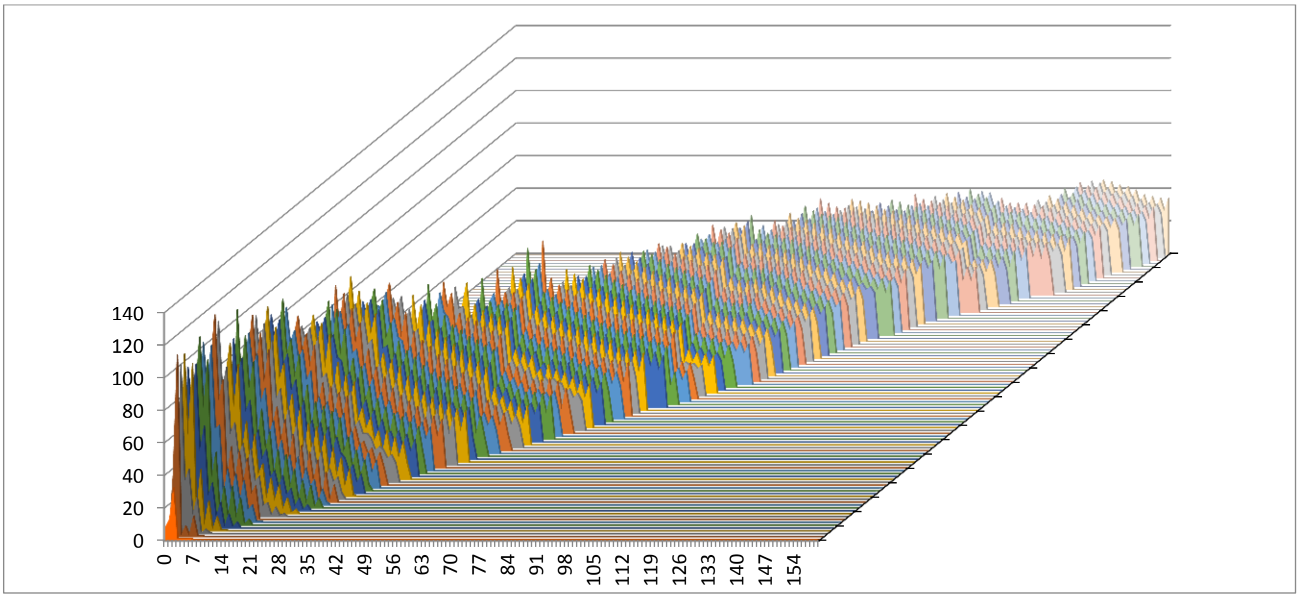


Fig. 6_6. A cloud of isotopes in the form of a three-dimensional graph of the number of bursts mu-neutrino in each isotope (per step of nr_nucleosynthesis)

We do not give a detailed analysis of the presented results of the calculation now, all this will be done in the next chapter, in which we will try to find the code ("key"), which determines why the process of nr_nucleosynthesis proceeded in such order and with such quantitative characteristics.

Now we can not but note the anthropic properties of the "boat" we calculated.

Anthropic properties of the "rook"

We have already described the concave character of the "deck of the rook" in all directions of sections. The minimum point of the "deck of the rook" corresponds to the isotope 56Fe, which contains nine mu-neutrinos per one nucleon (the minimum allowable amount for S_theory). All other isotopes have a larger average number of mu-neutrinos per nucleon.

The "rook" is, as it were, an inverted known graph of the binding energy of nucleons in stable isotopes (main-stream), only calculated for the entire cloud of isotopes. This form of the graph of the Communication Energy in the form of a "rook" even better (more clearly) demonstrates possible nuclear reactions in the isotope cloud.

According to S_theory, the excess of the mu-neutrino in an isotope in excess of 9 pieces. on a nucleon is potentially a prerequisite for possible nuclear reactions. This means that the bulk of the isotopes have some potential for "rolling" towards the "keel of the boat" and along it toward the "pit" around the 56Fe isotope (in the SM stability valley).

In other words, the "rook" calculated by us and the "mechanism" of nuclear reactions in the S_theory through the mu-neutrino bursting, predetermine, under certain conditions, the gradual conversion of all isotopes in our universe into a set of stable isotopes. The "rook" itself makes it possible to predict possible types of nuclear reactions for each isotope and to calculate the energy result of these reactions from the difference in the level of the "deck of the rook" for the initial and the resulting isotopes (that we will do in one of the next chapters devoted to the S_analysis of modern nuclear reactions).

In this circumstance, one can not fail to notice a certain anthropic property of the "boat", because it seems to predetermine the existence of a certain energy potential inherent in the resulting spectrum of isotopes. This potential, as it is realized through various nuclear reactions, energizes the whole of our Universe, without which the evolution of matter would be impossible. And interestingly, this potential was formed during the sequence of energetically grounded steps of nr_nucleosynthesis. All the steps went with the expenditure of energy of the simples (bursting mu-neutrinos), and as a result, "a giant battery" of energy was" born. "

Whether the formation of such a spectrum of isotopes ("rook") was random, or corresponded to some given (external or internal) algorithm, we will try to analyze in the next chapter.

The final isotope distribution in the universe after nr_nucleosynthesis

The initial number of relic neutrons formed was finite. This means that at each step of nr_nucleosynthesis the amount of remaining relic neutrons decreased. And the number of nuclei of different isotopes - "hunters" behind relic neutrons with each step increased. Relic neutrons were "in great demand", like "hot pies". Up to superheavy nuclei, only the isotopes formed at the very beginning of nr nucleosynthesis could "reached out". With a decrease in the number of relic neutrons, the probability of the formation of new superheavy isotope nuclei all fell and fell.

As a result, the more nucleons in the nucleus, the fewer such nuclei are synthesized. The process stops when the relic neutrons are completely depleted.

At the same time, we should not forget that the process of nr_nucleosynthesis starts from the process of decay of a relic neutron into a proton and an electron, with subsequent conversion into a hydrogen atom. And this process does not stop with the appearance of the first protons and the beginning of the process of nr_nucleosynthesis. The process of decay of relic neutrons and formation of hydrogen nuclei goes parallel to the process of nr_nucleosynthesis, while relic neutrons exist.

The density of the remaining relic neutrons at each step is constantly decreasing, and accordingly the probability of synthesis of heavier isotopes decreases. The final density of the isotope spectrum will decrease, probably in proportion to the two processes described above, i.e. The formula for the density of a particular type of isotope will be:

$\rho = 1 / A^2$, where A is the number of nucleons in the isotope.

In Fig. 6_7 shows the final density of isotopes at the end of nr_nucleosynthesis.

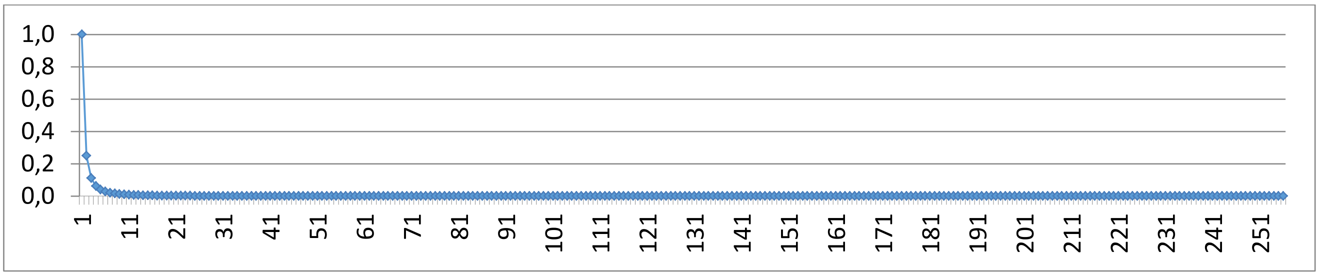


Fig. 6_7. The final density of the isotope spectrum at the end of nr_nucleosynthesis

As we see, this graph "truthfully" reflects the specific ratio of the density of the main isotopes in the Universe: the density of atomic hydrogen is assumed to be 1, then the density of isotopes 4He is 0.0625 or 6.25% by the number of isotopes, which corresponds to 25% by the number of nucleons or by mass.

The density of the other isotopes after the primary nr_nucleosynthesis is very small, but this does not mean that it can be "neglected". One of the main conclusions of the S_model of primary nr_nucleosynthesis lies precisely in the fact that it gives the "right to life" for all isotopes of spectrum of isotopes (elements) formed in the gas clouds of universe, which explains the presence of these elements in the bowels of the planets formed from these gas clouds in the formation of stellar systems.

Subsequently, the β-decay and β+_decay processes will correct the composition of the "cloud" of isotopes formed after the primary nr_nucleosynthesis. Further, the formation of stars and the launching of the thermonuclear fusion processes will continue to work on the composition of the "cloud" of isotopes already on a local scale.

In the work [10] we have already mentioned, the following graph of the relative abundance of chemical elements in the solar system is presented:

Fig. 6_8. The prevalence of chemical elements in the solar system

This graph differs from our graph (Fig. 6_7) in that it has a logarithmic scale of abscissas and is "wired off" by a chain of thermonuclear and other nuclear reactions going to the Sun, which is not taken into account in the process of nr_nucleosynthesis.

Have relic neutrons remained in the universe?

We have finished our discussion of the section devoted to the primary nr-nucleosynthesis of the isotope spectrum. With the end of the stock of relic neutrons, this process ends.

Relict neutrons are ended in a global universe scale.

But let's ask ourselves: have not the relic neutrons remained in any "caves" of the Universe and can not they be found in "our" time?

According to the theory (and SM, and ST), free neutrons can not exist for a long time, they either disintegrate, or interact with other particles in any nuclear reactions.

But there is another option - if is there somewhere in the universe the conditions in which relic neutrons are born "in our time"? And if there is, then we could try, at least remotely-theoretically, to "observe" some reactions with their participation.

It is clear that such "conditions" can not be "simple" nuclear reactions with "modern" nuclei and particles (we can not put new mu-neutrinos into "modern" neutrons, they can only burst).

But, after all, we know the mechanism by which relic neutrons were born. For this, virtual photons (VP) and a short-term powerful magnetic field (SPMF) are needed. Are there such conditions in the "modern" universe?

As for virtual photons, everything is fine - they are born and die in a vacuum everywhere in huge quantities.

And for the role of SPMF can to claim the jets of black holes-quasar or neutron stars-pulsars (magnetars). If these variants of the birth of simples exist realistically, then it turns out that in the "our" time in the bowels of the Universe there is a continuous synthesis of matter (!), However, at this the energy of the jets expended and the total balance of energy does not change.

And one more option - if the birth of simples is possible in jets of "natural" objects of the Universe, then why not try to repeat these conditions artificially in the corresponding experiment, the scheme of this experiment we cited in the first chapter. Similar experiments can be "the work" the LHC or ITER "dry" without injecting bunches of protons (or plasma) into them. The powerful magnetic field of the LHC or ITER will, in doing so, play the role of SPMF, and the VP should appear "in the field of detectors" themselves.

The SPMF should stretch the VP into simples-spirales different lengths. Some of them (long ones) will be twisting into simple-bagels with charges (+) or (-), they can be "pulled apart" in different directions by an electric or magnetic field and at the same time try to measure their mass and charge by special detectors. The masses of the bullet simples should be equal to the masses of the mu-simple or tau-simple, and the values of the charges should be equal to +1/6 or -1/6.

Short simples-spirales, having different charges, can not twisting into simple-bagels. They too will fall under the action of an external electric or magnetic field, which will try to "pull apart" them in different directions, but the powerful internal magnetic vortices of the simples-spirales will have to "overcome" the action of the external electric or magnetic field and, as a result, the short simples-spirales will be attracted and annihilate, reporting about it the flux of gamma-quantum and of electron-neutrinos, which can be detected by special detectors.

It is not excluded that these processes occur, for example, in the LHC during its operation "spontaneously", while the results of these processes are recorded by the corresponding LHC detectors. However, the scale of these processes by their energy is not comparable with the energy of proton bunches, and the results of "our" processes "drown" in the flow of information from the planned experiments of the LHC.

"Defecton"

The standard model assumes the presence of an internal structure of protons and neutrons, i.e. some elements of which they are composed. So far these are two types of elementary particles - quarks and gluons. Moreover, the explanation of the mass defect phenomenon in nuclear reactions is declarative in nature - the mass of the gluon cloud is changing.

If we assume that there is a third type of particles in the composition of nucleons, let us conventionally call them a "defecton", and these particles have a mass equal to the mass of the mu-neutrino (0.18582935 MeV) and burst in the course of all nuclear reactions, then the Standard model receives a powerful additional apparatus for the prediction and analysis of the results of nuclear reactions.

And many of the results and conclusions of S_theory made in the last two chapters become an additional section of the Standard Model.

There is no sense especially to develop and substantiate this idea. All that has already been said about the role of the mu-neutrino in the structure of nucleons and their role in all nuclear reactions can be transposed to this new elementary particle the "defecton", including it in the Standard Model.

True, in this case it is necessary to recognize (or allow) a decrease in the mass of nucleons in the course of all nuclear reactions.

This development of the Standard Model has its own meaning. But only if the "failure" of S_theory is proved. So far, we believe in S_theory and continue our presentation further.

Conclusion of the 6th chapter

In the 6th chapter, a variant of the algorithm for the "two-dimensional" nr_ nucleosynthesis of an isotope cloud is proposed. The calculation of this process is carried out according to the proposed algorithm. The result of calculating the isotope cloud is visualized in the form of a three-dimensional graph ("rook"), which is an analog of the two-dimensional graph of the binding energy for main-stream.

The great anthropic role of the resulting "rook" form is noted, in the following chapters an attempt will be made to search for physical regularities and a theoretical algorithm for the formation of this "rook" form.

A fundamental conclusion is drawn about the exclusive role of the mu-neutrino in the reactions of nr_nucleosynthesis and other nuclear reactions. A proposal is made for the possibility of expansion of the Standard Model by including particle (similar to mu-neutrinos) concerning in the list of constituent components of nucleons as the third component (defectons), along with quarks and gluons. [This option can only be considered if the S_theory is declared insolvent.]

Chapter 7. Was there a CODE in the process of nr_nucleosynthesis?

The process of nr-nucleosynthesis is based on the S-models of the relic neutron and other basic particles of matter proposed by us, constructed from only five standard sizes of electromagnetic simples (Su, Sd, Se, Sμ, Sτ) and four electromagnetic micro vortex objects (virtual photon, real photons, gluons, electron-neutrino).

The process of primary nr_nucleosynthesis of the isotope spectrum translates the "analogue" model of atomic mass defects (isotopes) to integer "arithmetic" of the number of incoming mu-neutrinos and bursting and remaining "intact". The mu-neutrinos are "firewood" that burn in the "furnace" of all nuclear reactions and are responsible for the negative balance of the mass defect (energy).

We also calculated what happens to the other S_components of the nuclei and analyzed the relationship of the change in their number to the forces of strong interaction and the evolving energy.

The obtained data correlate well with the known theoretical and experimental mass-energy characteristics of the reactions of nucleosynthesis of the isotope cloud. The mass defect of all the reactions of nr_nucleosynthesis, calculated on the basis of the reference isotope masses, ideally fits into the S_model proposed by us.

All this is interesting, BUT so far we have not explained at all why, when assembling relic neutrons into the nuclei of isotope, this isotope spectrum is formed, with the masses with which we are dealing.

In fact, all our calculations were performed on the basis of known reference isotope masses, as a result, we found out how many mu-neutrinos burst at each step of nr_nucleosynthesis, but we have not yet explained why at each step of nr_nucleosynthesis exactly such quantity of mu-neutrinos are busted that leads to the formation of isotopes with certain by mass (?). After all, it can not be assumed that the number of bursting mu-neutrinos was determined by the mass of the resulting isotope. Obviously, the dependence here is inverse.

First, let's put the question - What would happen if at each step of nr_nucleosynthesis another quantity of mu-neutrinos would be busted? What would that affect?

It is clear that this would affect the energy of the reactions of nr_nucleosynthesis (the more the mu-neutrino bursts, the more the energy stored in them is released).

But we are not interested in this now. How much energy was released during the process of nr_nucleosynthesis is certainly important, but for us it is "not important" in this now. The main thing is that as a result of nr_nucleosynthesis with a different number of bursting mu neutrinos, completely different isotopes would form (with a different number of mu neutrinos remaining in them). As a result, all isotopes would have a another mass, another energy potential and their nuclear properties would be another.

Let us restate the question differently : that the spectrum of isotopes that really arose after nr_nucleosynthesis, it was formed randomly or is it the result of some predetermined physical process that realizes a certain CODE (algorithm) for the formation of just such a spectrum of isotopes of our universe (?).

Towards to S_theory, the question posed is formulated more specifically-by which CODE (algorithm) was determined the number of mu-neutrinos that burst with the formation of isotopes at each step of nr_nucleosynthesis?

The importance of a correct answer to this question is extremely relevant also because it has an Anthropic character.

Anthropic nature of the problem of searching for the CODE of isotope formation in the Universe

The anthropic nature of the question of the formation of isotopes in the universe has two components (2 parts).

1-part - how in the process of formation of the spectrum of isotopes they have formed a unique spectrum of electronic shells possessing unique abilities responsible for the evolution of matter (the ability of electronic isotope shells to enter into chemical reactions, form a variety of chemical conglomerates, including those that enter into biochemical reactions etc.)? What is the role of isotope nuclei and their specific parameters in this process?

Part 2 - it is obvious that the mass spectrum of isotopes (nuclei of isotopes) formed also has an anthropic character. It determines the shape of the known graph of the binding energy of nucleons in the nuclei of main-stream isotopes and the unique shape of the "rook" responsible and determining the entire set of nuclear reactions in the universe, i.e. constant energy supply of the universe and the provision of energy for all chemical and biochemical reactions, and ultimately the evolution of matter in the universe.

We are faced with the task of understanding by what algorithm such a spectrum of isotopes was formed, with such masses of nuclei and with such electronic shells.

Let's start with electronic shells.

Is there a CODE in our universe that links the structure of isotope nuclei with the properties of their electron shells (the first part of the Anthropic principle)

The process of nr_nucleosynthesis of the isotope spectrum is primarily a nuclear process. The formation of electrons and electronic shells of isotopes in it is, as it were, a secondary process.

It is known that the number of electrons, the shape and the number of levels and sublevels (orbits and orbitals) of the electron shells of isotopes through which electrons rotate, depend primarily on the charge of the isotope core. There are corresponding models and methods for calculating the parameters of electron shells of isotopes.

We will not deal with these models and methods. We are interested in another question. Having an S_model of the structure of isotope nuclei, will we be able to find some correlation between this S model and the structure of the electron shells of isotopes?

And, omitting the questions of the shape, levels and sublevels (orbits and orbitals) of the electron shells, we will look for a correlation between the S-model of the nuclei and the "final" properties of the electron shells, which consist in the periodic character of their chemical properties according to the periodic table of Mendeleev.

As already noted, in S_theory, the key element of all nuclear reactions, incl. and nr_nucleosynthesis, is the process of mu-neutrino bursting. If this process to take as a basis (see column 10, Table 1) and to record a string with the quantity of mu-neutrinos busted and the type of nucleon formed, we get a sequence of symbols:

10p-15n-40p-114n-0n-33p-43n-101n-15p-46p-65n-96p-30n-51p-62n-76p-26n-47n- ... etc.

This sequence uniquely determines the composition (internal structure, charge and mass) of the stable isotopes of the main stream of our universe. We conditionally named this sequence of symbols the CODE our Universe.

Initially, we assumed that the above CODE had to carry in itself information about the chemical properties of the isotopes of our Universe, i.e. correlate with the periodic properties of these isotopes in the periodic table.

However, all our attempts to establish such a relationship have not been crowned with success.

Moreover, it turned out that the CODE presented in itself is not really unambiguous.

In fact, we have already noted above that the same main-stream isotopes could be formed in the isotope cloud in different ways: both as a result of the reactions of primary nr-nucleosynthesis, and as a result of the β-decay or β + decay of isotopes located diagonally from above or from the bottom of the main-stream, and other ways. And this means that the sequence of nucleons (protons and neutrons) in the same isotope formed by different paths may be different. The quantities of mu-neutrinos that burst at individual steps of these paths can also be different.

As a result, at this stage we have to make a **conclusion - it is impossible to establish the relationship between the internal structure of the nuclei of chemical elements and the properties of these elements in the periodic table of Mendeleyev. The only kernel parameter that correlates with the properties of elements in the periodic table is the charge of the element's nucleus** .

The electronic structure of atoms (electronic orbitals), and therefore the chemical properties of elements, depends not on the internal structure of the atomic nuclei, but only on the charge of their nuclei (the number of protons).

True, if we recall the planetary model of atoms, then the parameters of the electron orbits should also be affected by the ratio of the masses of the nuclei and electrons.

As a result, the first part of **the Anthropic Principle (in Ed. 1)** can be formulated as follows.

The magnitude of the total nuclear charge and its total mass determine the electronic structure of the isotope- the number, size, and shape of the electron orbitals (potential wells in the electric field of the nucleus) over which electrons spin. The electronic structure of atoms and the magnitude of the potential barriers to the transition of electrons from the orbital to the orbital determine the chemical properties of atoms.

It turns out that the Creator (Nature or God) as much as possible simplified the relationship between the structure of nuclei (nuclear physics) and the structure of atoms (electronic physics - chemistry), reducing it to two elements - the charge and the mass of the nucleus.

It seems that if the electronic structure and chemical properties of atoms depended on more parameters of their nuclei (nucleon sequences, nucleus forms, etc.), then such a connection would not be deterministic, and our world would be unstable or unpredictable and just could not exist.

Variants of the answer to the question of searching for the CODE, which determines the algorithm for the number of bursting mu-neutrinos (the second part of the Anthropic principle)

There are three possible options for answering the question:

1) the number of bursting mu-neutrinos was random.

2) the number of bursting mu-neutrinos was determined by external factors (external control);

3) the number of bursting mu-neutrinos was determined by internal factors of the isotope synthesis process (internal control).

Analysis of the variants of the "control" of algorithm of management of process of the bursting mu-neutrino

Random number.

It is possible to assume that the quantity of bursting mu-neutrinos was random. Only this option does not stand up to any criticism. This would mean that in the process of nr_nucleosynthesis identical isotopes by composition of nucleons, but with different masses (different number of mu-neutrinos remaining in them) could be formed, which is not observed experimentally.

External control option:

Examples of "external control" of physical processes can be, for example:

A) The process of formation of the electron shell of atoms, going "under control" of the electromagnetic field (wave function) of the atomic nucleus. The electron orbits are located in the potential wells of the wave function, which determine the level of their energy.

B) The process of multiplication (division) of cells by forming an identical copy of the cell core under the control of DNA from the elements of the environment.

In our case, the option of external natural "control" is somehow not "visible". In our isotope formation model, there is no external template (either in the form of physical objects or in the form of field structures) that influences the process of relic neutron attachment and determines the number of bursting mu neutrinos.

Internal management option:

Most physical processes occur under "internal control". What it is?

All objects of physical processes have a certain set of physical properties (parameters). These properties of objects through objective physical laws interact with each other and determine the result of this process.

According to this scheme, all the physical processes described by us "so far" have passed. This is the process of the formation of simples, the formation of elementary particles from the simples, the processes of formation and decay of the relic neutron, the processes of formation of standard nucleons, and the process of nucleosynthesis of the isotope spectrum. As objects in all these processes, electric and magnetic vortices appearing to enter the electromagnetic interaction in accordance with the laws of interaction of vortices. The result of this interaction has always been predetermined.

But it turns out that the last process (nr_nucleosynthesis of the isotope spectrum), in addition to the physical component that determines the course of the process, also has some "information component" that determines the number of burst mu-neutrinos.

In fact, the physical scheme of the process is "absolutely" the same at each step of nr_nucleosynthesis (another relic neutron joins, in which case the mu-neutrino may burst or under the hoop of quarks - then a proton is formed, or "far away" from the quark hoop - then a neutron is formed, i.e there are only two options in terms of physics). However, the quantitative result of the process (the number of mu-neutrinos that burst) is completely different when nuclei of different isotopes are formed. Moreover, it is completely incomprehensible why, when forming identical isotopes, the same number of mu neutrinos always burst, - who determines this?

This issue is "aggravated" by the fact that it has an Anthropic character. The fact is that, if the number of bursting mu-neutrinos in the formation of protons and neutrons were always the same, then the shape of the "rook " would have a purely "two-story" character without peaks and pit. It is the "disparity" in the number of bursting mu-neutrinos in the formation of different isotopes is determines the anthropic form of the "rook", the specific mu-neutrino residue in nuclei of isotopes per nucleon. This form of "rook" (Figure 6_2) creates the prerequisites for the implementation of all nuclear reactions.

In other words, the "disparity" in the number of bursting mu-neutrinos leads to a "disparity" in the specific mass of isotopes per nucleon, which provides, in effect, the energy reserve of nuclear "firewood" in the emerging universe. The subsequent gradual use of these "firewood" provides energy for all the processes of transformation and evolution of matter in the universe.

Those. in the process of nr_nucleosynthesis, not a group of "dead" isotopes were born, but everything was done "by the mind" - a spectrum of isotopes was formed that could enter into nuclear reactions and for a long time to energize our Universe. And all this was determined by the specific number of bursting mu-neutrinos in the synthesis of each isotope.

From the foregoing, we formulate the 2 nd part of the Antropic Principle (in Ed. 1):

Anthropic principle (red. 1, part 2)

The nuclear properties of isotopes are determined by the masses of their nuclei, which in turn depend on the number of bursted and remaining mu-neutrinos in the nuclei of isotopes when isotopes are formed in the process of nr_nucleosynthesis. The key parameter determining the nuclear properties of isotopes is the specific amount of the remaining mu-neutrinos per one nucleon of nucleus ("rook"), which determines the admissible set of nuclear reactions in the isotope cloud. Under natural conditions, such conditions for nuclear reactions develop that make them distributed over time, which ensures the maintenance of the necessary energy conditions for the evolution of matter in our Universe.

We are faced with the task of finding an internal CODE that controls the process of nr_nucleosynthesis and determines the number of bursting and remaining mu-neutrinos.

A brief review of nuclear models and attempts to calculate nuclear parameters on the basis of these models

In classical nuclear physics, the solution of the problem of searching for an internal algorithm (CODE), which makes it possible to calculate the parameters of isotope nuclei, already has a whole history. The determining element of all these attempts is the compilation of a specific atomic nucleus model. A whole set of these models is known: the drop model of the nucleus, the shell model of the nucleus, and the magic nuclei, and the generalized model of the nucleus, etc. For these models, there are formulas for calculating the parameters of the nuclei, the main of which is the mass of the nucleus taking into account the emerging mass defects.

The most well-known drop model of the nucleus. For the drop model of the nucleus there is the famous Weizsacker formula, which makes it possible to calculate the mass of the isotope core, knowing the number of nucleons in the isotope (A) and their composition (Z is the number of protons and N is the number of neutrons). Below is a classical view of the Weizsacker formula:

$$E_{св} = a_1A - a_2A^{2/3} - a_3Z^2/A^{1/3} - a_4(A/2 - Z)^2/A + a_5A^{-3/4}, \text{ где}$$

$W_{объем} = a_1A$ - объемная энергия ядра;

$W_{пов} = a_2A^{2/3}$ – поверхностная энергия ядра;

$W_{кул} = \frac{3}{5}\frac{(Ze)^2}{A^{1/3}}$. - кулоновская энергия ядра;

$W_{сим} = a_4(A/2 - Z)^2/A$ – энергия симметрии ядра;

$W_{пар} = a_5A^{-3/4}$ – энергия разрыва нуклонной пары.

Входящие в формулы коэффициенты a_1, a_2, a_3, a_4 и a_5 оцениваются из экспериментальных данных по энергиям связи ядер, что дает

a_1 = 15.75 МэВ; a_2 = 17.8 МэВ; a_3 = 0.711 МэВ; a_4 = 23.7 МэВ;

$$a_5 = \begin{cases} +34 \text{ МэВ} & \text{для четно - четных ядер} \\ 0 & \text{для нечетных ядер} \\ -34 \text{ МэВ} & \text{для нечетно - нечетных ядер.} \end{cases}$$

In Fig. 7_1 and 7_2 are graphs reflecting the contribution of various terms of the Weizsacker formula to the specific binding energy and comparing the experimental values of the specific binding energy for different isotopes and the results of calculations using the Weizsacker formula.

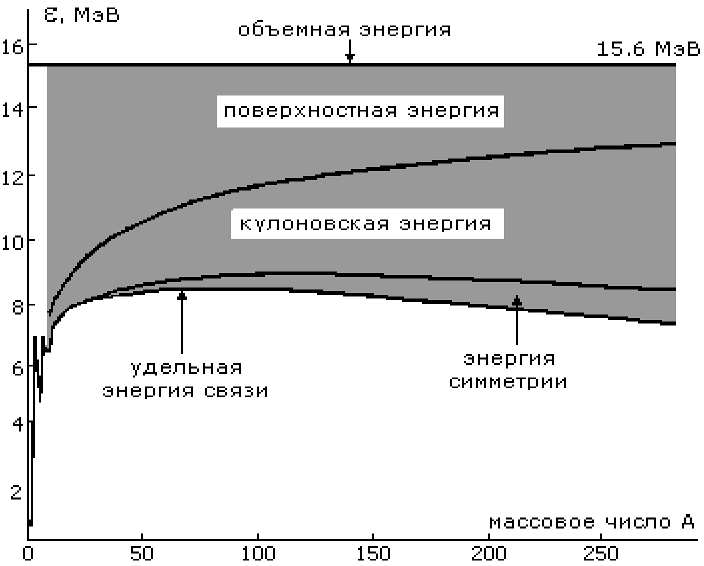


Fig. 7_1. The contribution of various terms to the Weizsacker formula for the specific binding energy

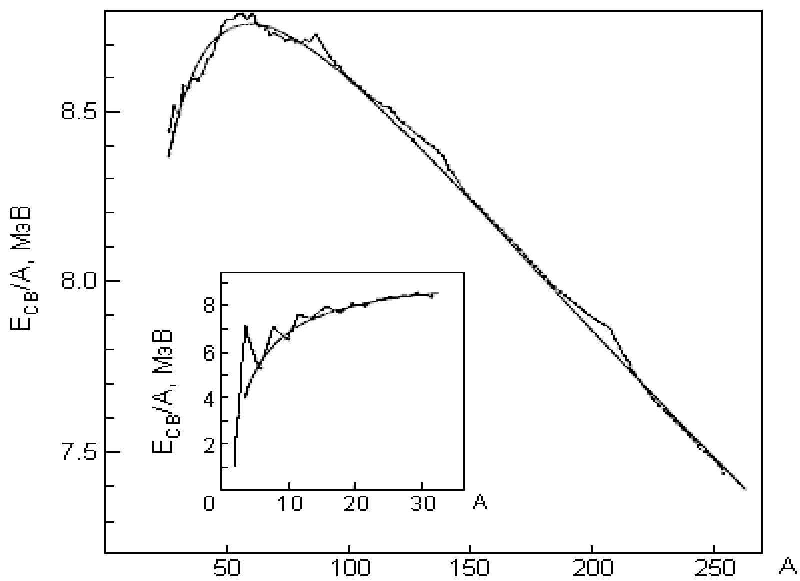


Fig. 7_2. The experimental values of the specific binding energy and result of calculation by the Weizsacker formula

Weizsacker's formula makes it possible to calculate the binding energy of a nucleus, knowing the number of nucleons and protons in the nucleus, and hence calculate the resulting mass defect relative to the standard masses of protons and neutrons, which ultimately determines the mass-energy properties of the resulting isotope.

We are faced with a similar task.

Here, only the model of the nucleus, constructed by us in the framework of S_theory, is fundamentally different from the listed nuclear models. In the S-model, there is neither the bulk energy of the drop, nor the surface tension energy, nor the transitions of nucleons between the levels and sublevels of the shells, etc.

The kernel model in S_theory is a "sausage" (consisting of a chain of torus-like aggregates of protons and neutrons), folded into a "bend" or "tangle".

The methodology for constructing S_CODE (of calculating the mass of isotope nuclei in S_theory)

According to the S-model of atomic nuclei, their mass is determined by the mass of the components of nucleons, of which the nuclei consist, namely: tau-neutrinos, mu-neutrinos, "hoops" of quarks of nucleons, flagellum of gluons.

If the first three components are "personified" (belong to specific nucleons), then the gluon flagellum is the "socialized property" of the entire nucleus of the atom.

In addition, the mass of the tau-neutrinos and of the "hoops" of the quarks are constants (const) for all nucleons. All nucleons contain 60 pcs. tau-neutrino, the "hoop" of quarks of all protons consists of (2u + d) quarks, the "hoop" of quarks of all neutrons consists of (u + 2d) quarks, and the quantities (and their masses) do not vary from isotope to isotope.

But the number of mu-neutrinos in each nucleon and their total amount in the nucleus of the isotope, as well as the total mass-energy of the gluon flagellum, vary from the isotope to the isotope. In the course of all nuclear reactions, the mu-neutrinos are bursted and their total number decreases, while more and more new gluon flagellums's are formed, and their total mass (energy) increases.

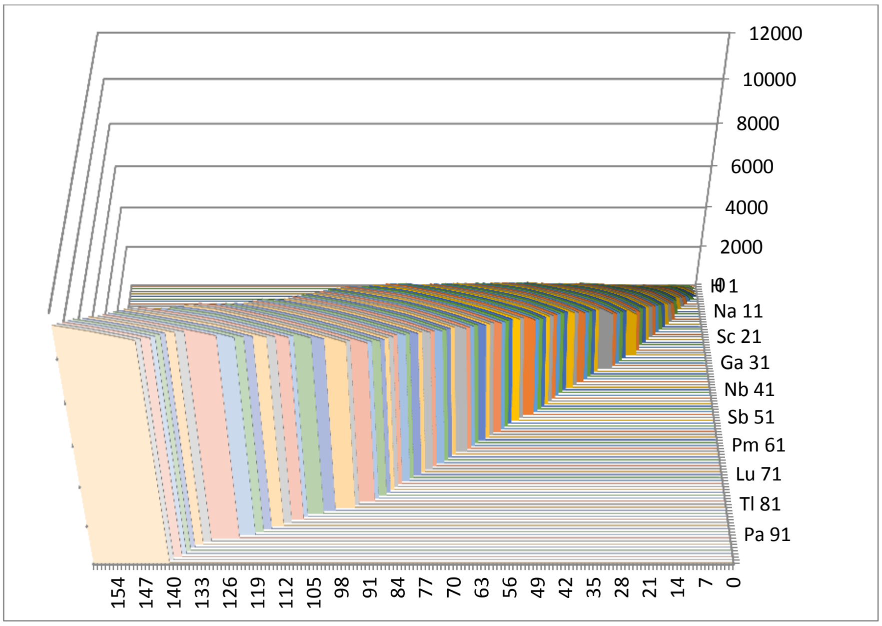
It turns out that the mass of a specific isotope is determined by the number of mu-neutrinos remaining in it and by the mass-energy of the formed flagellum of gluons.

According to our calculations, the ratio of the total mass-energy of the gluon flagellum to the total mass of the mu-neutrinos remaining in the isotope is in the range $5 * 10^{-9}$ - $6.3 * 10^{-3}$, i.e. the variable part of the isotope mass is determined mainly by the mass of the mu-neutrinos remaining in them. Therefore, with the further construction of the CODE of process of nr_nucleosynthesis, we will not take into account the dynamics of the mass-energy change in the gluon flagellum, but focus on the change in the number of mu neutrinos.

How many mu-neutrinos "should" remain in the isotope we do not know in advance, this amount can be calculated by knowing the total number of mu-neutrinos that burst during the formation of this isotope. To do this, it is necessary to subtract the total number of burst mu-neutrinos at all steps nr_nucleosynthesis of the given isotope from the value = 61 * A - the initial amount of mu neutrinos in relic neutrons spent on the formation of this isotope.

In Fig. 7_3 and 7_4 are three-dimensional graphs of the total number of burst mu-neutrinos and the total number of remaining mu neutrinos in the formation of an isotope cloud, calculated on the basis of reference (experimental) isotope masses.

Please note that the term "total quantity" means the total number of burst or remaining mu-neutrinos from the beginning of the process of nr_nucleosynthesis (the decay of the relic neutron and the formation of the nucleus of the hydrogen atom) to the formation of the nucleus of a particular isotope.



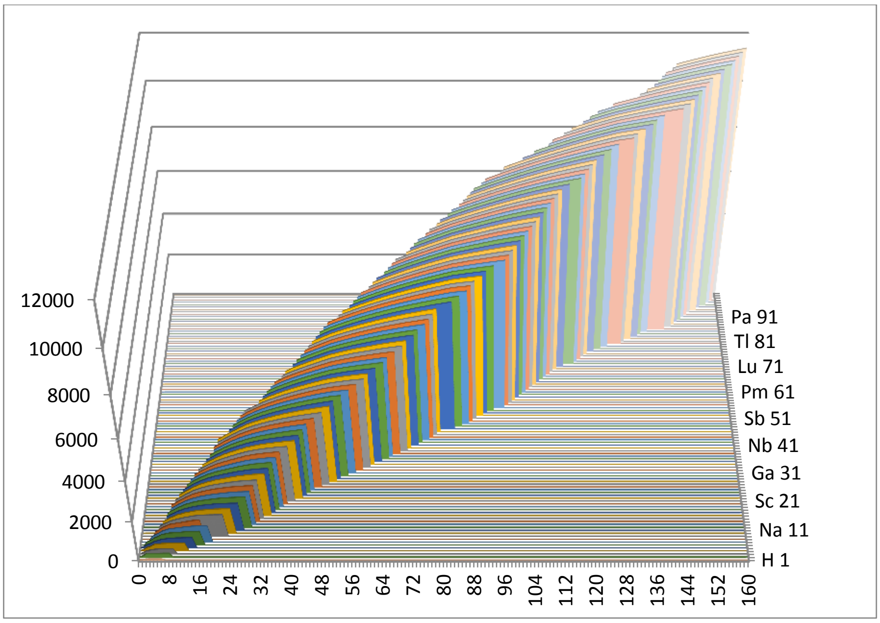
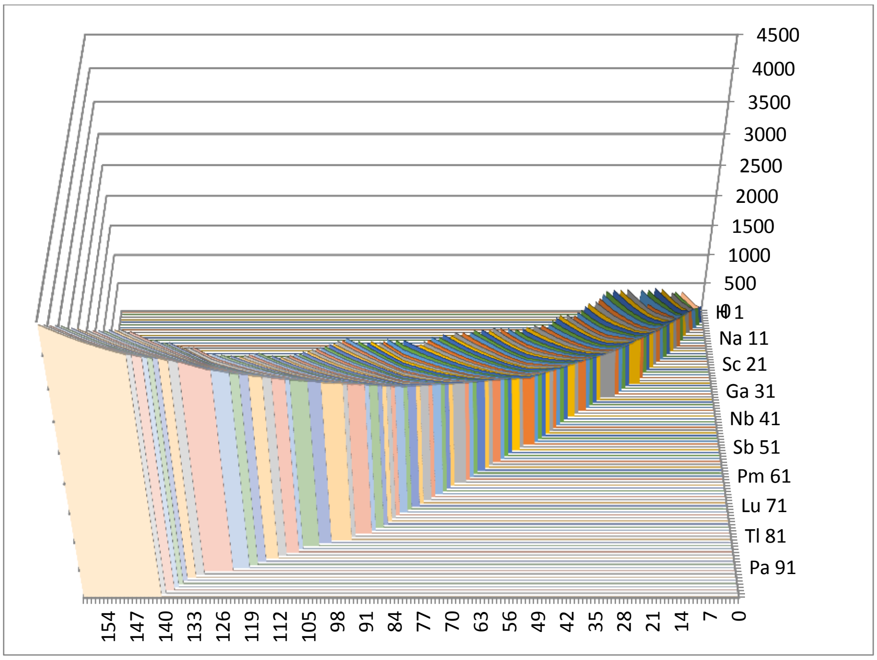


Fig. 7_3. The total number of burst mu-neutrinos at education clouds of isotopes (view from both sides)



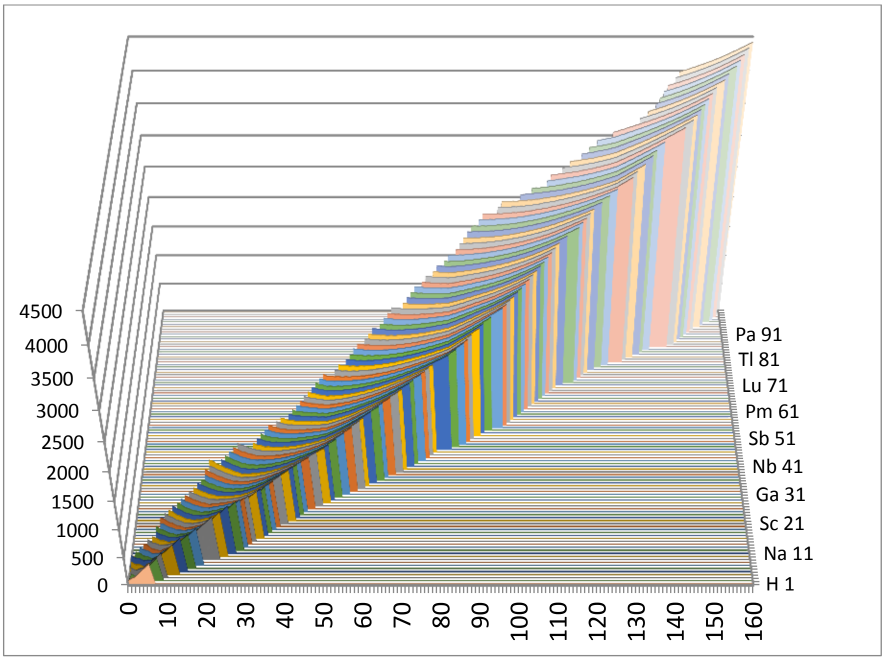


Fig. 7_4. The total number of the remaining mu-neutrinos upon formation clouds of isotopes (view from both sides)

By convexity and concavity of the upper part of the graphs, it is easy to understand that they complement each other up to the total number of mu-neutrinos in the corresponding number of relic neutrons expended on the formation of a specific isotope (values of 61*A).

We see that the total quantity and bursting mu-neutrino, and the remaining mu-neutrino at the isotope cloud is constantly increasing when the number of nucleons in the isotope increases.

It can be seen from the presented graphs that they completely lost the "individual details" of the number of bursting mu-neutrinos at each step of nr_nucleosynthesis (for clarity, let us recall this graph again, see Fig. 7_5).

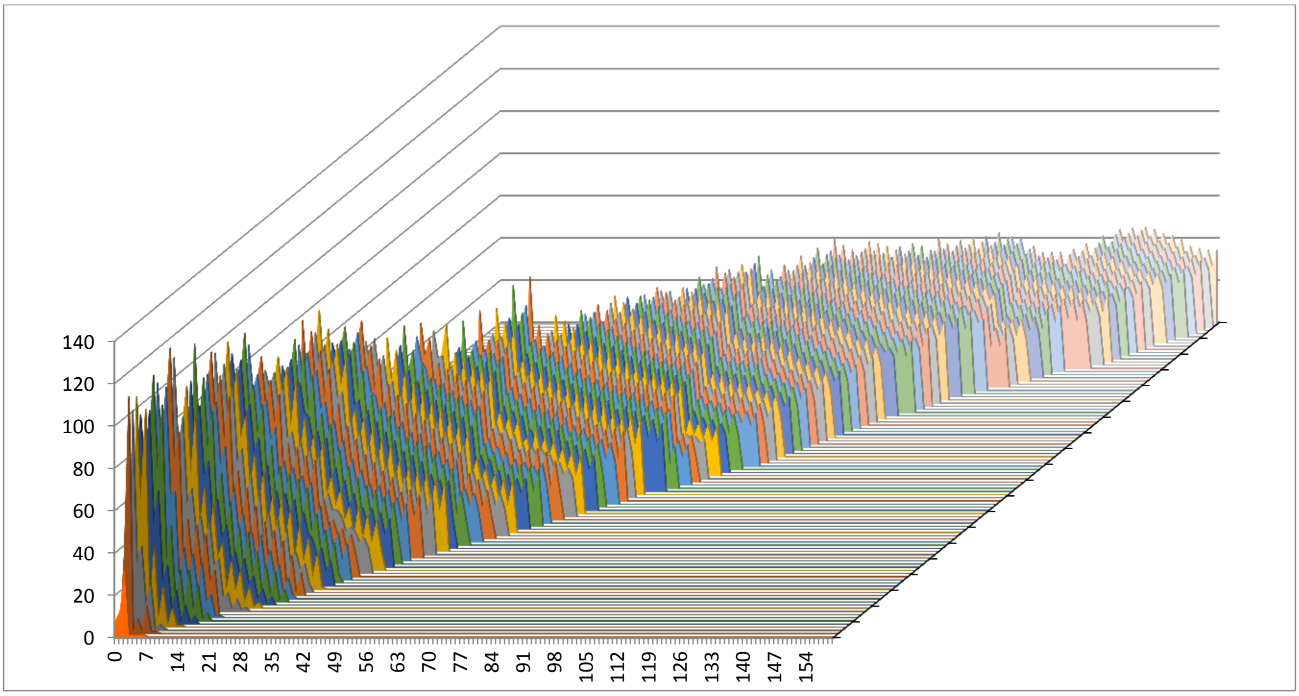


Fig. 7_5. A cloud of isotopes in the form of a three-dimensional graph of the number of bursts mu-neutrinos in each isotope (for each step of nr_nucleosynthesis)

This graph shows in more detail, so far not known to us the features that determine the number of bursted and remaining mu-neutrinos when forming in of particular isotope.

The task - to build a mathematical model of CODE based on the graphs of the total number of burst or remaining mu neutrinos "does not make sense", we get a model of "average temperature in the hospital", no better than the Weizsacker formula (all the the details of graph of of the number of bursts mu-neutrinos in each isotope (for each step of nr_nucleosynthesis) will be disappear).

Therefore, in our mathematical model of CODE, we will simulate the graph (and its regularities) of the number of bursting mu neutrinos at each step of nr_nucleosynthesis, and will recalculate the results into the total number of burst and remaining mu neutrinos in each isotope (and ultimately, the mass of isotopes) and in the end build a theoretical graph of the binding energy for main-stream and "rook" for the isotope cloud.

But bearing in mind that our CODE "internal" (the number of burst mu-neutrinos at each step of nr_nucleosynthesis is determined by the internal parameters of the nuclei), we need to clarify the details of the internal structure of the nuclei in S_theory.

Details of the internal structure of the nuclei according to S_model of the kernel, by and large, is a design. It is built purely according to the laws of electro-magnetic interaction of the constituent components of the nucleus, and from this point of view, of course, has some integral electro-magnetic "portrait". This "portrait" on the outside has three clearly expressed electromagnetic components:

The first is the generalized Coulomb charge of the nucleus (Z).

The second is the dipole moment of the nucleus, formed from the dipole moments of the nucleons.

The third one is a magnetic gluon "pier" from one end of the "sausage" for attaching new relic neutron (we recall that the second end of the sausage was sealed with tau neutrinos with the formation of the deuterium nucleus and can not act as a "berth" for subsequent relics neutrons).

Details of the internal structure of the nuclei according to S_theory

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The first component works outside the isotope at large distances through virtual photons (microdipoles) and, as applied to the formation of the structure of nuclei in the process of primary nr_nucleosynthesis, plays a purely "watchdog" role - "repels" uninvited guests (repels protons and other positively charged nuclei) without impeding the rapprochement to relic neutrons.

The additional role of the charge of nuclei is manifested later in the formation of an atom - this is the formation of the structure of orbitals for electrons by means of potential wells in the wave function. This issue is not considered in our work.

The second component works outside the isotope at considerable distances in comparison with the dimensions of the nuclei also through virtual photons (microdipoles). Its purpose is mutual orientation and attraction of surrounding relic neutrons, also possessing a dipole moment.

The third component works outside the isotope through the flagellums of gluons ("hair") dangling from the side of the "berth" at distances commensurate with the size of the nucleus, and it is this component that is responsible for the capture and addition of another relic neutron.

In addition to these external components of the electro-magnetic "portrait" of the nucleus, it has the Fourth internal component, these are internal flagellums of gluons responsible for the screed of all nucleons of the nucleus. In the previous chapter, we called them another SGW (standing gluon wave).

The third and fourth (gluon) components are detailed in S_theory for the time being that is extremely not enough, only their total mass (energy) is "known" about them. At the same time, these components are responsible for the addition of a relic neutron and the binding force of all nucleons of the nucleus (and hence for the number of bursts of mu-neutrinos).

Although the last statement (in parentheses) is reciprocal. It can be argued with the same success that the number of flagellums of gluons, and hence their mass (energy), depend on the number of "holes" in the slit magnets, i.e. the number of burst mu-neutrinos.

Let us summarize: The concept of "cloud of gluons" is used in SM, is playing the role of "glue" between nucleons. In ST, we come to the notion of a standing gluon wave (SGW) of flagellums of gluons playing the role of an internal harness that pulls together the nucleons of the nucleus into a single "sausage", squeezes them and regulates the process of the bursting of the mu-neutrino in all nucleons of the nucleus in nuclear reactions. It should be noted that the process of mu-neutrino bursting is unidirectional - new mu-neutrinos can not appear on the site of those who burst, wherein the minimum number of mu-neutrinos in one nucleon is 9 pcs. But the flagellums of gluons at each step of nr_nucleosynthesis, and in general for all nuclear reactions, only grow (their mass-energy increases).

In addition, it must be borne in mind that "quark hoops" , which are physical elements of slotted magnets in all nucleons, can not "shrink" into one "point" (one circle), this will be hampered by the finite elasticity of the simple-bagels, of which tau-neutrinos and mu-neutrinos . This "obstacle" leads to the grouping of nucleons into "beads" of 4 pcs, at least in the initial part of the spectrum of isotopes. All this must be taken into account when constructing the mathematical model of CODE of nr_nucleosynthesis.

Construction and analysis of the digital nr-nucleosynthesis model of the isotope cloud in the form of the number of burst mu-neutrinos at each step of nr_nucleosynthesis

We continue searching for CODE (key) that determines the number of burst mu-neutrinos at each step of nr_nucleosynthesis.

On which side we will do approach this task?

It can be from the side of the SGW (a standing gluon wave). It would be nice to learn how to calculate it. For sure, it carries information about the force of attraction of nucleons in certain parts of the nucleon nucleus chain, depending on the shape of the nucleus (the mutual arrangement of neighboring nucleons) and the number of mu-neutrinos that burst in them.

How to calculate SGW? There is a classical approach to this problem - to try to calculate the electromagnetic interaction between the slotted magnets of nucleons and the degree of nucleon compression, taking into account the elastic deformation of the simples of tau-neutrinos and mu-neutrinos. The scheme of this version of the calculation looks like this.

The known electromagnetic and geometrical parameters of nuclei are taken as a basis.

On the basis of S_Models, we have already defined a fairly complete list of electromagnetic parameters and geometric sizes of simples and various "aggregates" that form nucleons and nuclei. We, however, do not know enough the values of all these parameters, especially electromagnetic ones. But we can, based on certain phenomenological prerequisites, give an estimate of the values of these parameters.

Further, it remains only to carry out the corresponding variation calculations and determine which values of the electromagnetic parameters of the simples correspond to the known parameters of the "aggregates" and nuclei constructed from them.

Having determined all the electromagnetic parameters of the simples and the geometric parameters of the "waveguides" formed by the simples, one can proceed to calculate the through electromagnetic function, i.e. SGW.

We have already done something like this, calculating the masses and geometrical sizes of the simples on the basis of known reference masses and the sizes of standard nucleons. But the problem of electromagnetic synthesis of nucleons in nuclei is certainly much more complicated.

Even, not looking at the radio engineering education of one author (with specialization in the field of microminiature microwave devices) and the physical and mathematical preparation of another author (physics and mathematics School + Novosibirsk University + RES), we do not undertake for these calculations at this stage. It would take too much time for them. Therefore, we leave this version of calculations for future research.

As a result, it remains for us to go in a simple "arithmetic" way-to analyze the actual number of bursting mu-neutrinos in all nucleons of the isotope for each step of nr_nucleosynthesis and try to identify the objectively existing regularities of this process.

"Arithmetic" way of analysis and detection of regularities of the CODE of formation of the cloud of isotopes

As a basis for this analysis, we take the previously calculated cloud of isotopes, with the number of bursting mu-neutrinos in the formation of each isotope (Table 9 and Fig. 7_5). We calculated these data in constructing a "rook" of isotopes that represent the average number of remaining mu-neutrinos per nucleon of each isotope (Fig. 6_2).

We would like to remind you that our calculation was performed for the "Horizontal Algorithm" (order) of nr_ nucleosynthesis of isotopes in the cloud (see Fig. 6_1). We described this algorithm (order) in detail in the previous chapter. Its essence lies in the fact that nr_nucleosynthesis of almost all isotopes (~ 97%) proceeds successively along the horizontal rows of isotopes, by attaching relic neutrons with their conversion into a neutron. And only the first isotopes of horizontal series (~ 3%) are formed by attaching relic neutrons with their transformation into a proton. We made this assumption quite arbitrarily to formalize the procedure for calculating the number of bursting mu-neutrinos in the formation of isotopes. As far as this assumption is correct, we will discuss it further. Now we turn to the construction of a digital model of nr_nucleosynthesis of the isotope cloud, remembering that all our calculations will relate to the "Horizontal Algorithm" adopted by us.

To build a digital model, we need the original data of figure 7_5 in digital form. Below is the table. 10 (diagram) with the number of burst mu-neutrinos at each step of nr_nucleosynthesis in the form of an isotope cloud in the Z-N coordinates. These data should carry the patterns, the identification and formalization of which should help us to find the same CODE (key) of burst mu-neutrino in the process of primary nr_nucleosynthesis.

Table 10. Number of burst mu-neutrinos per step nr_nucleosynthesis (Part 1)

эл.	p\n	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
H	1	8	13	32	1	1	1	1																										
He	2		38	112	1	7	1	13	1	1																								
Li	3		7	104	32	40	12	23	1	3	1																							
Be	4		6	109	59	103	10	38	4	19	1	9	1	1																				
B	5		6	99	72	101	47	63	20	28	7	16	1	9	1	4																		
C	6			9	78	116	72	102	28	45	8	24	5	24	5	17	1	4																
N	7				7	111	82	109	58	60	15	33	17	30	13	26	8	11	1	1														
O	8					6	93	126	73	86	24	45	23	42	22	38	16	21																
F	9						6	120	78	92	51	58	37	45	30	42	22	25	7	9	1	6	1	2										
Ne	10							9	85	105	64	92	38	57	29	49	24	31	9	22	8	18	3	10	1	3								
Na	11								6	106	78	94	61	68	39	50	32	38	21	25	14	22	10	14	3	8	1	4						
Mg	12								6	122	81	106	72	90	41	61	36	47	21	36	14	33	13	24	5	17	3	14	1	6				
Al	13									7	83	106	82	93	63	72	43	52	32	40	24	31	15	30	13	23	12	16	2	10	2			
Si	14									10	90	115	82	104	73	94	47	59	37	51	26	42	15	35	13	31	13	26	1	19	1	11		
P	15										6	113	87	108	80	98	62	68	44	56	35	47	20	38	22	35	19	30	11	19	11	14	4	
S	16											10	90	117	84	104	72	82	48	63	39	55	25	45	25	43	24	38	14	30	13	24	6	17
Cl	17												6	110	92	107	79	86	63	70	48	57	34	45	33	44	32	41	24	35	25	22	14	18
Ar	18													10	92	118	84	93	70	84	49	65	37	55	34	52	32	49	29	45	24	33	15	25
K	19														7	111	89	97	79	85	66	72	43	56	42	53	41	49	39	46	26	35	18	27
Ca	20															13	91	104	81	93	73	86	47	63	44	61	41	57	41	55	29	36	25	27
Sc	21																6	96	87	95	79	89	64	67	54	62	49	59	46	56	34	38	30	30
Ti	22																	14	86	101	82	96	68	89	53	72	49	64	45	60	36	44	31	38
V	23																		6	95	88	98	78	87	73	71	58	64	52	61	41	47	34	41
Cr	24																			14	89	106	75	101	72	89	58	71	51	66	44	54	35	46
Mn	25																				7	102	84	98	83	90	72	75	58	66	50	57	41	48
Fe	26																				6	112	85	107	79	98	76	89	59	73	52	62	43	56
Co	27																					6	81	105	86	99	81	92	74	77	56	63	48	58
Ni	28																					6	83	114	86	105	81	98	78	91	57	67	50	63
Cu	29																								6	97	89	98	82	92	68	70	56	65
Zn	30																									11	90	103	83	96	72	82	57	71
Ga	31																										6	91	88	99	77	83	71	69
Ge	32																											7	91	103	77	91	70	85
As	33																												6	92	82	93	76	85
Se	34																																12	92
Br	35																																	6

Table 10. Number of burst mu-neutrinos per step nr_nucleosynthesis (Part 2)

эл.	p\n	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64
S	16	1																															
Cl	17	7	12																														
Ar	18	9	19	4																													
K	19	14	22	9	17																												
Ca	20	20	23	14	20	11																											
Sc	21	27	20	22	20	15	17	12																									
Ti	22	24	30	16	30	15	26	13	23	10																							
V	23	28	35	24	28	21	28	18	26	15	23																						
Cr	24	30	41	24	37	22	35	19	32	16	29	14																					
Mn	25	36	43	33	36	26	36	25	34	21	30	19	27																				
Fe	26	37	49	32	45	27	41	24	38	24	31	19	32	19	30																		
Co	27	42	52	37	47	34	42	28	39	25	38	21	35	20	33	19	30																
Ni	28	44	59	38	53	34	50	33	43	26	40	24	38	23	37	21	33	19	32														
Cu	29	49	60	44	55	40	51	36	46	30	44	29	41	29	35	28	32	24	32	13													
Zn	30	51	65	44	61	39	56	36	51	33	49	30	47	27	43	27	38	24	36	14	25	12											
Ga	31	57	66	51	62	46	57	43	52	37	51	36	47	33	43	33	39	27	39	19	25	17	23	14									
Ge	32	56	73	50	68	46	64	41	59	38	56	37	52	34	48	32	45	28	41	20	31	17	28	15	23	10							
As	33	69	73	57	67	52	64	47	60	44	57	41	54	39	49	37	47	33	43	24	30	22	28	20	23	14	20	13					
Se	34	71	86	56	76	51	71	47	66	45	62	41	58	39	55	38	51	33	48	26	35	24	30	20	27	15	25	13	24				
Br	35	70	87	72	75	55	70	54	66	51	61	46	59	44	56	42	53	38	49	29	35	28	33	24	28	18	26	17	24	17	24		
Kr	36	14	95	73	83	59	76	56	70	51	67	46	63	44	61	42	58	40	55	31	39	29	35	25	31	19	29	17	29	17	28	16	27
Rb	37		6	67	88	76	73	62	68	56	66	52	63	49	60	49	58	48	55	34	40	32	36	29	33	23	30	20	29	23	27	22	28
Sr	38			13	93	77	86	64	74	57	71	51	69	49	66	47	63	47	61	36	43	33	41	30	38	25	33	23	33	21	34	19	32
Y	39					6	88	75	76	60	71	57	67	55	65	53	65	52	63	38	44	37	42	35	39	30	34	25	33	29	32	29	29
Zr	40						20	75	89	61	76	57	72	54	70	53	68	52	66	40	48	38	46	36	44	32	36	26	39	28	36	27	34
Nb	41								6	72	77	61	73	59	68	55	70	56	66	44	49	40	47	39	45	34	38	32	40	31	39	28	38
Mo	42									20	88	63	74	62	72	57	73	56	70	45	54	41	51	38	48	33	46	31	45	30	42	29	39
Tc	43										6	72	77	64	73	63	71	61	70	48	55	44	52	41	50	38	47	35	45	34	44	31	41
Ru	44											16	90	66	76	63	76	60	73	50	59	45	56	42	54	38	51	35	49	33	47	32	44
Rh	45												6	73	77	68	76	65	74	52	61	48	58	45	55	42	52	39	50	37	48	35	45
Pd	46													16	88	68	81	65	78	53	64	50	61	46	58	43	55	40	53	37	51	35	49
Ag	47														6	74	82	69	79	57	65	52	61	50	59	47	55	44	53	41	51	38	49
Cd	48															12	96	69	83	57	69	53	66	50	63	47	60	44	57	41	55	39	52
In	49																6	74	85	61	69	56	66	53	63	51	61	48	58	45	55	43	52
Sn	50																	12	97	60	74	56	70	54	67	51	64	48	62	45	60	43	57
Sb	51																				6	55	70	58	68	55	65	52	63	49	60	45	58
Te	52																					12	76	57	73	55	70	51	65	51	64	46	62
I	53																							6	70	60	70	57	67	54	64	51	61
Xe	54																								17	58	75	56	72	53	69	51	66
Cs	55																									6	72	60	73	58	68	56	66
Ba	56																										17	62	75	59	72	57	68
La	57																												6	59	74	60	70
Ce	58																													17	76	61	73
Pr	59																														6	60	74
Nd	60																																16

Table 10. Number of burst mu-neutrinos per step nr_nucleosynthesis (Part 3)

эл.	p\n	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96
Rb	37	17																															
Sr	38	15	28	14																													
Y	39	23	26	20	23	18																											
Zr	40	24	31	21	29	18	27																										
Nb	41	25	33	22	31	21	29	19	26																								
Mo	42	27	36	23	35	21	33	20	30	18																							
Tc	43	28	37	26	36	28	33	23	31	21	29	20																					
Ru	44	30	40	27	39	27	36	23	34	21	34	20	33																				
Rh	45	33	43	31	39	28	37	26	35	24	35	23	33	22																			
Pd	46	32	47	31	44	28	43	26	39	24	37	24	37	23	35																		
Ag	47	36	47	34	45	32	43	30	39	29	40	26	38	26	36	25	34	23	32														
Cd	48	37	50	35	48	33	46	30	45	29	43	27	42	27	39	24	38	23	36	11	20												
In	49	41	50	38	49	36	47	34	46	33	44	31	43	31	40	31	37	29	36	14	21	13	19										
Sn	50	42	53	39	52	36	51	35	49	33	47	32	46	31	44	30	42	30	41	15	23	13	22	12									
Sb	51	44	55	41	53	39	51	38	50	36	48	35	47	34	45	32	43	32	41	19	21	19	20	17	19								
Te	52	44	59	42	57	40	54	39	52	37	51	35	49	34	47	33	45	33	43	19	27	19	25	17	24	16	23						
I	53	48	60	45	58	44	55	42	53	40	51	38	49	36	48	36	46	35	43	22	29	22	26	20	25	19	23	18					
Xe	54	49	63	47	60	44	58	42	56	40	53	39	51	37	50	36	48	36	45	23	33	21	31	20	30	18	28	17	26	16			
Cs	55	53	62	51	61	49	58	46	55	43	53	42	51	40	50	39	49	38	46	25	33	25	31	24	30	21	28	21	26	20	26	19	25
Ba	56	55	66	51	63	48	61	46	59	43	57	42	54	40	52	39	51	39	48	27	36	26	35	24	33	21	32	21	31	21	29	19	28
La	57	56	67	53	64	51	61	49	59	47	56	45	54	43	53	42	51	42	49	29	37	29	35	27	35	24	33	25	32	25	30	22	28
Ce	58	58	70	55	67	51	64	49	62	47	60	45	58	44	55	42	54	42	51	31	40	29	39	27	37	25	36	25	35	27	32	25	31
Pr	59	60	71	58	67	55	63	53	62	50	60	48	58	47	55	45	54	44	52	33	41	32	39	29	38	29	37	30	37	29	33	26	32
Nd	60	62	73	59	71	56	68	51	65	50	63	48	61	47	58	45	57	45	54	34	44	32	42	30	41	29	41	30	41	30	36	28	34
Pm	61	6	72	61	71	59	68	56	65	52	62	52	60	50	59	49	57	48	55	37	44	35	43	33	41	32	44	33	42	33	37	30	35
Sm	62		15	62	74	59	72	55	68	52	66	51	64	50	61	48	61	48	58	38	47	36	45	33	44	32	46	33	44	33	40	31	37
Eu	63			6	71	62	71	59	68	56	65	54	65	53	61	52	61	52	58	40	47	38	46	36	44	35	48	36	45	36	42	33	39
Gd	64						17	59	71	57	69	54	68	53	65	52	64	51	62	41	50	39	48	36	48	35	49	36	47	36	44	33	42
Tb	65							6	69	59	69	57	67	59	63	55	64	55	61	44	50	43	48	40	48	39	51	39	49	38	45	36	43
Dy	66								15	60	73	58	70	58	68	54	68	54	65	44	54	42	52	40	52	38	52	39	50	38	48	36	46
Ho	67									6	68	62	71	61	66	58	68	57	65	46	54	45	53	43	52	41	53	42	51	40	49	39	47
Er	68											15	75	60	72	58	70	56	67	47	57	45	56	43	56	41	55	41	53	40	51	39	49
Tm	69												6	56	72	61	71	59	67	50	57	47	57	46	55	45	55	44	54	43	52	40	51
Yb	70														15	62	73	60	71	49	60	48	60	46	59	44	57	43	56	42	54	41	52
Lu	71															6	68	62	72	51	61	51	60	49	58	48	57	46	55	44	55	43	53
Hf	72																	15	74	52	65	50	63	49	62	47	60	46	59	44	57	43	55
Ta	73																		6	49	66	52	63	53	60	51	60	49	59	46	57	45	55
W	74																				16	53	67	51	64	50	63	48	61	46	60	45	58
Re	75																					6	63	53	65	54	61	51	61	50	59	48	57
Os	76																						13	54	68	51	65	51	64	49	62	47	61
Ir	77																							6	62	53	66	54	63	52	62	51	60
Pt	78																								11	54	69	52	66	51	64	49	63
Au	79																										6	46	66	54	64	52	62
Hg	80																											9	70	53	67	52	65
Tl	81																															6	61
Pb	82																																11

Table 10. Number of burst mu-neutrinos per step nr_nucleosynthesis (Part 4)

эл	p\n	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128
Ba	56	18																															
La	57	20	26																														
Ce	58	22	29	19																													
Pr	59	24	29	22	27																												
Nd	60	25	32	22	30	21																											
Pm	61	27	33	25	31	23	28																										
Sm	62	29	35	26	33	24	30	21																									
Eu	63	30	36	28	34	26	31	24	29																								
Gd	64	32	38	30	36	27	34	25	31	22																							
Tb	65	35	39	31	37	29	35	27	32	25	30																						
Dy	66	35	43	32	39	31	38	29	35	26	32	24																					
Ho	67	37	44	35	41	33	38	31	36	28	33	26	30																				
Er	68	37	47	36	43	34	41	32	38	30	36	27	33	25																			
Tm	69	39	48	38	45	37	42	35	39	32	37	29	35	27	31																		
Yb	70	40	50	38	47	37	45	36	42	33	38	31	38	27	34	26																	
Lu	71	43	50	41	48	39	46	38	43	35	40	34	38	32	34	30	32	28															
Hf	72	41	53	41	50	40	47	38	45	36	43	34	41	32	38	30	35	28	35	26	34												
Ta	73	44	53	43	51	41	48	39	47	38	44	37	42	34	39	32	37	30	35	29	34	28											
W	74	44	56	43	53	42	50	40	49	39	47	37	45	35	41	32	40	31	38	28	39	28	37										
Re	75	46	56	46	54	44	51	42	50	41	49	39	47	36	43	35	41	33	39	32	38	31	37	30									
Os	76	46	59	46	56	44	54	42	52	41	51	40	48	37	46	35	44	33	43	32	42	32	40	30	37								
Ir	77	48	59	47	57	46	55	44	53	43	51	42	49	39	48	37	46	36	45	35	43	34	40	33	39	32	37						
Pt	78	47	62	47	59	46	57	45	55	43	53	41	51	39	51	38	49	36	48	35	46	34	44	33	42	31	41	30	39				
Au	79	51	61	49	59	48	57	47	55	46	53	44	52	41	52	41	50	39	48	39	47	37	45	37	42	35	40	34	38	32	34		
Hg	80	50	64	48	63	47	61	46	59	44	58	43	56	42	54	41	53	40	51	39	49	38	47	37	45	35	43	34	42	32	38	19	28
Tl	81	53	64	51	63	48	62	47	60	47	57	44	57	43	55	43	53	42	52	41	49	40	48	40	46	38	44	37	42	36	38	22	28
Pb	82	53	66	51	65	49	64	48	62	47	60	45	59	44	57	43	56	42	54	42	52	41	50	40	49	39	47	38	45	38	41	23	29
Bi	83					6	57	50	62	49	60	49	58	47	57	46	56	45	54	43	53	43	51	41	49	40	47	39	45	39	42	26	29
Po	84								16	50	62	48	61	46	59	45	58	44	56	44	54	43	52	42	50	40	49	39	47	39	43	26	34
At	85												6	49	57	47	58	47	57	46	55	44	53	43	51	42	49	41	47	40	43	29	34
Rn	86													14	62	48	59	46	58	45	57	44	55	43	52	42	50	41	49	40	44	29	38
Fr	87																6	47	59	47	57	46	55	45	54	44	51	43	49	42	45	31	38
Ra	88																		17	48	59	46	57	45	55	44	52	43	50	42	46	32	41
Ac	89																					6	58	47	55	45	54	45	51	43	47	34	42
Th	90																							17	58	46	55	45	53	44	48	35	44
Pa	91																									6	55	46	54	45	49	36	46
U	92																													21	49	38	46

Table 10. Number of burst mu-neutrinos per step nr_nucleosynthesis (Part 5)

	p\n	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160
Hg	80	19	28																														
Tl	81	21	28	21																													
Pb	82	22	29	21	29	20																											
Bi	83	25	29	23	30	22	29	21																									
Po	84	25	33	24	32	23	32	21	31																								
At	85	28	34	26	33	25	33	24	32	23	31																						
Rn	86	28	37	27	37	25	35	24	35	24	33	23	33	22	32	22																	
Fr	87	31	38	30	37	30	35	28	34	27	33	26	33	25	31	25	30	23															
Ra	88	31	41	30	40	30	38	29	36	28	36	26	35	25	34	24	33	23	32														
Ac	89	33	41	33	41	34	38	32	37	31	37	29	35	29	34	28	32	26	31	25													
Th	90	34	44	33	44	33	42	32	40	31	40	30	38	29	36	27	35	25	33	25	32												
Pa	91	35	45	36	44	37	42	36	41	34	40	33	38	31	37	30	34	29	33	28	31	26											
U	92	37	46	37	46	36	45	36	44	34	43	33	41	33	38	30	37	29	35	27	33	26	32										
Np	93				16	39	46	39	45	37	43	36	42	34	39	32	37	31	35	29	34	28	32	27									
Pu	94						29	38	47	38	45	36	43	35	41	33	39	32	37	30	35	29	34	27	33	26							
Am	95								18	40	46	38	44	37	43	35	40	34	37	31	36	30	34	28	33	27	31						
Cm	96									27	48	39	45	37	44	35	42	34	39	32	38	31	36	29	35	27	33	25	32				
Bk	97										16	41	47	39	45	38	43	36	40	34	39	33	37	31	35	28	33	27	32	26			
Cf	98											24	48	40	46	38	45	36	42	35	41	34	39	32	37	29	35	27	34	26	33		
Es	99													15	47	39	46	38	43	37	41	36	40	34	38	30	36	29	34	28	33	27	
Fm	100														23	40	46	38	45	37	43	36	42	35	40	31	37	29	36	28	35	27	35

Above in Fig. 7_5 shows the three-dimensional graph of this table, giving in a generalized form a visual representation of the number of burst mu-neutrinos in the formation of each isotope.

The table with the data, even though it turned out to be broken into five parts, but in it all the essential information is represented in a digital form - the coordinates of Z, N of each isotope and the number of mu-neutrinos that burst during its formation.

When constructing a three-dimensional graph (Fig. 7_5), for better visibility of the "relief", we mirrored the data about the horizontal axis N (the number of neutrons from 0 to 160 pieces). On the Z axis are 100 elements (from 1 to 100 el, i.e from hydrogen to fermium) goes into the distance. The number of burst mu-neutrinos is plotted vertically.

The three-dimensional graph was in the form of some kind of "propeller-like wedge". Almost vertical surface of the "collapse" of the number of bursting mu-neutrinos in isotope groups of the first chemical elements is gradually "turned" into an almost horizontal surface (with a slight deflection) of the number of bursting mu-neutrinos in isotope groups of the last chemical elements.

We remind you that this graph is calculated and constructed on the basis of reference (experimental) data on isotope masses. According to S_theory, it is this "wedge" that is the real (experimental) algorithm (E_CODE), with which the isotope spectrum of our universe was formed.

We are faced with a task consisting of four parts:

A) defragmenting the experimental "key" on components that have certain regularities;

B) construction of physical models for the realization of the revealed regularities determining the number of bursting mu-neutrinos;

B) development of a mathematical model of the theoretical "key" (T_CODE), which makes it possible to calculate the number of bursting mu-neutrinos, depending on the number of protons and neutrons in the isotope (isotope coordinates in the isotope cloud);

D) check the coincidence of the calculated data with the experimental data ("T-CODE" and "E-CODE").

We proceed to analyze the data and identify the individual features (regularities), which in the table we have identified in the form of color isotope coloring (table cells).

Brown color in table are marked the isotopes lying on main-stream .

The blue color indicates the isotopes formed as a result of the addition of protons (plus 1H and 3He, which hit the main stream and are colored brown). From these isotopes begin horizontal group, combining the isotopes of a single chemical element. According to S_theory, these isotopes were formed from the isotopes located above them, by attaching the relic neutron to its transformation into a proton (for brevity, we call them isotopes-protons). All the other isotopes of the group were formed by the successive addition of relic neutrons and their conversion into "simple" neutrons (for brevity, we call them isotopes-neutrons).

It can immediately be noted that it is in blue isotopes (the first isotopes-protons of the horizontal group) that the number of mu-neutrinos that have burst is always significantly smaller than in the second and third isotopes-neutrons of this group. In the subsequent isotopes of neutrons of all horizontal rows (groups), the number of bursting mu-neutrinos gradually decreases with increasing number of neutrons in the isotope, but not monotonously, but over some oblique wave-like process. In the table, this wavy process is marked by alternating lilac and white colors of vertical graphs. And all the lilac graphs contain isotopes with an increased number of bursting mu-neutrinos and have an even number of neutrons in their composition, and all white graphs contain isotopes with a reduced number of bursting mu-neutrinos and have an odd number of neutrons in their composition.

Above we have already noted that in each group of isotopes belonging to one element, the mu-neutrino bursts in the first nucleon of the group (isotope-proton) much less than in the second isotope of the group (isotope-neutron). And it is in the second (or third) isotope-neutron of all groups that the maximum amount of mu-neutrinos in a given group of isotopes bursts, and then this quantity decreases, but not uniformly, but according to descending "ladder" ("snakes") having different degrees slope, see Fig. 7_6.

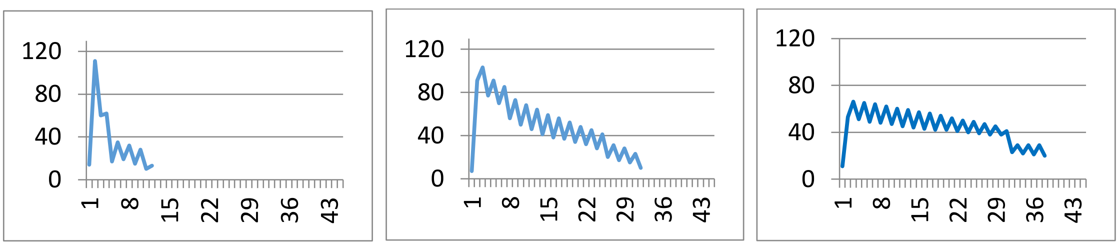

Fig. 7_6 "stairs" of the number of burst mu-neutrinos in the primary nr_nucleosynthesis for fluorine isotope groups (Z = 9), germanium (Z = 32) and lead (Z = 82)

The degree of slope of the "ladders" is different, the maximum in the isotope groups at the beginning of the cloud and gradually decreases toward the end of the cloud of isotopes.

Interestingly, this undulating process applies not only to individual isotope groups of a single chemical element, but is global for all length to the whole cloud of isotopes . The peaks (maxima) of this wave-like process correspond to the lilac isotopes of clouds with an even number of neutrons, and the white graphs of the isotope cloud with an odd number of neutrons correspond to the pits (minima) (see Table 10.).

In chemical elements in which isotopes-proton are located in white clouds graphs (with an odd number of neutrons), the next (second in the group) isotope-neutron enters the lilac graph and has the maximum number of burst mu-neutrinos for all isotopes of the given group (chemical element). These chemical elements are conventionally called "standard" and their designations in the table are white. In Fig. 7-6, an example of a "standard" group of isotopes is the "ladder" of fluorine.

In chemical elements in which isotopes-proton are located in lilac clouds graphs (with an even number of neutrons), the next isotope-neutron (the second in the group) falls into the white graph, while it has a much larger number of burst mu neutrinos than in the isotope-proton, but not the maximum for this group, because it is in the fovea of a wavy process. The next isotope-neutron (the third in the group) falls into the lilac column and has an even larger number of burst mu-neutrinos, which is the maximum value for all the isotopes of this chemical element. These chemical elements we conventionally called "non-standard" and their designations are colored yellow. In Fig. Examples of "nonstandard" isotope groups are "staircases" of germanium and lead. In general, the number of "standard" and "non-standard" elements ("ladders") in an isotope cloud roughly equals one another.

The observed regularities-the minimum number of bursting mu-neutrinos in the first proton isotope, then the "ascent" of the number of bursting mu-neutrinos to a maximum and the further wave-like decrease in the number of bursting mu-neutrinos, are characteristic of all horizontal isotope groups belonging to a single chemical element. We unite these regularities into one regularity and give it the name "ladder with a foot".

This regularity is of decisive importance for the formation of the concave form of the "rook" -the amount of the remaining mu neutrinos per nucleon of the isotope (see Fig. 6_2). To confirm this, let us recalculate the above three "ladder with legs" in the number of remaining mu-neutrinos per one nucleon (see Fig. 7_7).

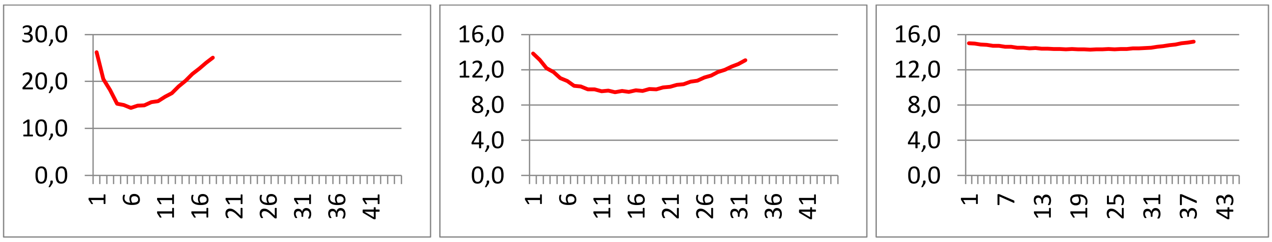

Fig. 7_7. Number of remaining mu-neutrinos per nucleon for fluorine isotope groups (Z = 9), germanium (Z = 32) and lead (Z = 82)

The resulting graphs are very characteristic for the concave section of the "deck of the rook" in its front, middle and aft parts of isotope cloud. And all this is determined by the graphs of the corresponding "ladders with legs". Bearing in mind that we have designated the concave character of the "deck of the rook" as an anthropic property of the "rook", it can be noted that this property is determined by the regularity we have identified with a "ladders with legs."

As we have already noted, the regularity of "ladder with a leg" (a reduced number of bursting mu neutrinos in a proton isotope, a sharp increase in the second isotope-neutron, a maximum in the second or third isotope neutron, and a further wave-like decrease in the number of bursting mu-neutrinos with growth number of neutrons) is characteristic not only of local (horizontal) groups of isotopes belonging to a single chemical element, but have also of a global nature, applied to the entire isotope cloud-the longitudinal section of the "boat" (see Figure 7-8).

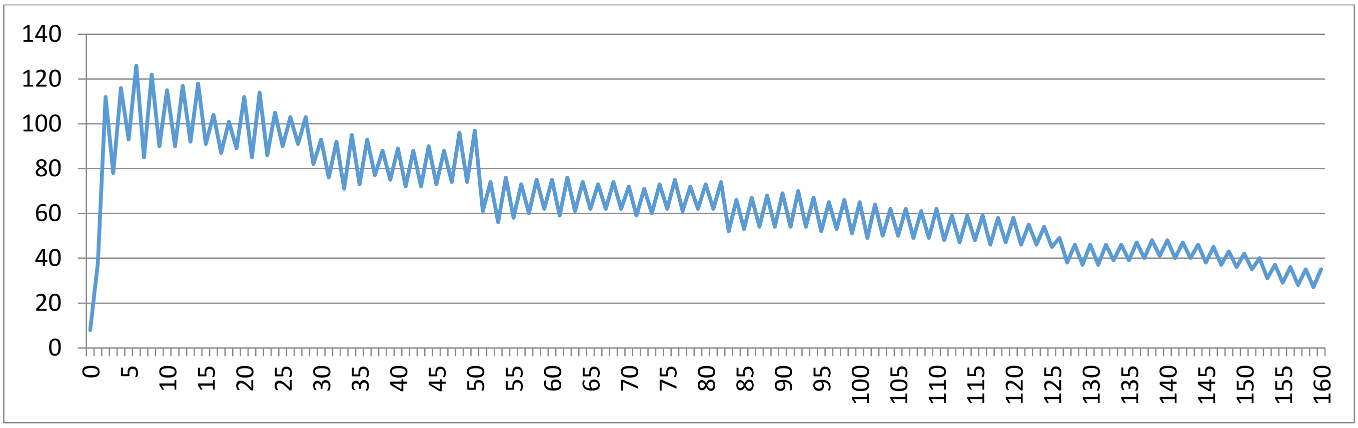

Fig. 7_8. A global "ladder with a leg" of the number of mu-neutrino bursts in the primary nr_nucleosynthesis depending on the number of neutrons in the isotope (along the rook)

The last graph shows the maximum number of burst mu-neutrinos among all isotopes with the same number of neutrons. Recalculating this graph in the number of remaining mu-neutrinos by one nucleon, we obtain a graph of the concavity of the "deck of the rook" in the longitudinal section along the left "board of the boat" corresponding to the maximum number of mu neutrinos that have burst (see Fig. 7_9).

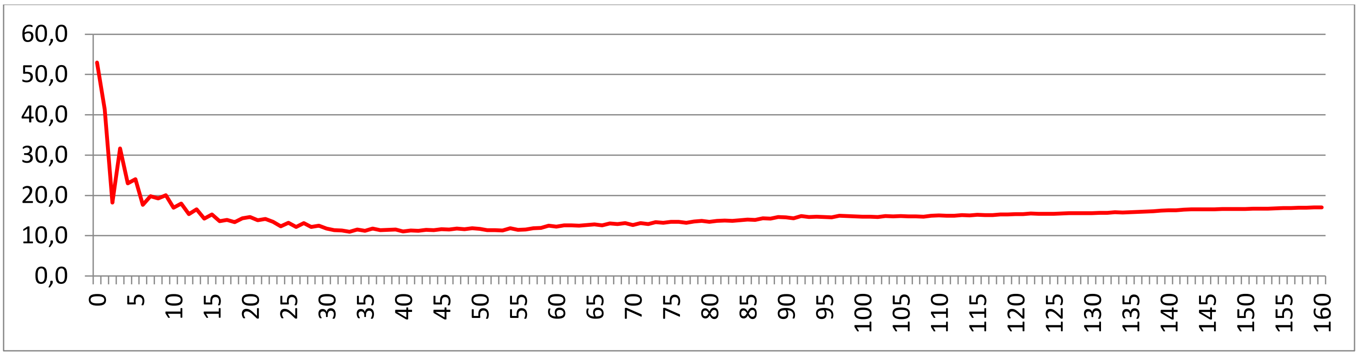

Fig. 7_9. The number of remaining mu-neutrinos per nucleon in the longitudinal section of the "rook" corresponding to the maximum number of burst mu-neutrinos

The regularity of the "ladder with a leg", which determines the concave shape of the "deck of the rook", is characteristic not only of the horizontal and longitudinal sections of the isotope cloud, but also for the majority of vertical sections of the cloud of isotopes ending with proton isotopes. Only the "ladder" along the vertical sections of the cloud grows monotonously without "pits" (without a wave-like process). the number of bursting mu-neutrinos in vertical sections increases with the increase in the number of protons, and then falls sharply downward in the last isotope-proton, see Fig. 7_10.

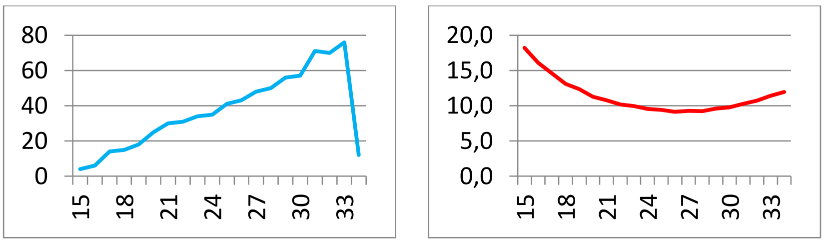

Fig. 7_10. Vertical sections of the cloud of isotopes and the "deck of the rook" passing through the isotope 57Fe

Vertical cross sections that do not have a isotope-proton at the end and to ending isotopes-neutron at the end have the maximum value of the number of bursting mu-neutrinos or with a slight decrease in their number. But since proton isotopes are their close neighbors and ancestors, and the number of bursting mu neutrinos in them is always much smaller, it strongly affects the overall calculation of the number of remaining mu-neutrinos per nucleon. As a result, the concave shape of the "deck of the rook" is preserved for such vertical sections, see Fig. 7_11.

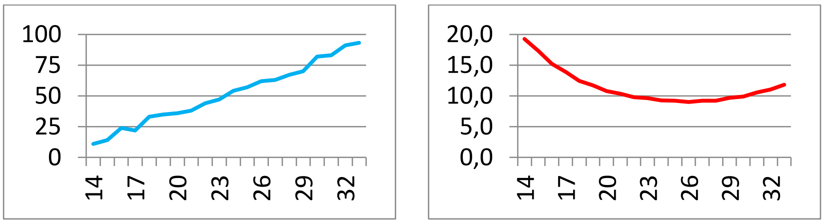

Fig. 7_11. Vertical sections of the cloud of isotopes and the "deck of the rook" passing through the isotope 56Fe (that do not have a isotope-proton at the end)

This regularity is also true for the transverse (diagonal sections) of the isotope cloud, in which the β_ decay of isotopes proceeds, see Fig. 7_12, 7_13.

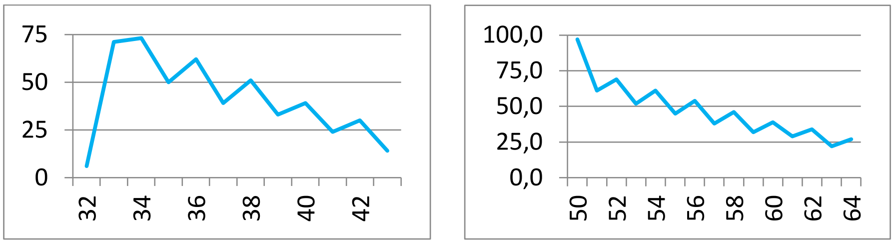

Fig. 7_12. The diagonal cross sections of the cloud of isotopes, Passing through the isotopes 67Zn and 100Ru

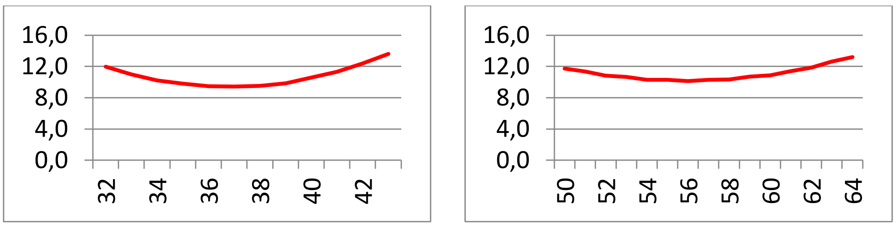

Fig. 7_13. The diagonal sections of the "deck of the rook" Passing through the isotopes 67Zn and 100Ru

Below, we will examine in detail the physical nature of the regularities of "ladder with a foot".

We have to build physical models that explain the process of mu-neutrino bursting in accordance with the regularities we have identified, and "pick up" the mathematical description of these physical models.

Seven isotopes (47Cl, 47V, 55Sc, 56Sc, 57Sc, 63Ga, 75Rb) are marked in red in the table, the number of burst mu-neutrinos in which is "knocked out" from the marked undulating process. We will not conduct a detailed analysis of the causes of these deviations, but we only note that, in our opinion, it is necessary to verify experimentally the mass of these isotopes and their isotopes-neighbors.

Black is the isotope 14O, in which the maximum number of mu-neutrinos burst is 126 pcs. As well this isotope is in the lilac row.

Above on the three-dimensional graph, of number of bursting mu neutrinos (Fig. 7_5), three stages on which doubled height steps down the global wave-like process are clearly visible, corresponding to vertical rows of isotopes with a neutron number of 51, 83 and 127 pcs. These "doubled" steps are characteristic for all isotopes with the indicated number of neutrons (see Table). These vertical rows of isotopes we called "ravines" and marked in the table in green.

Let us turn to the construction of physical models, the revealed regularities.

The transformation of the isotope cloud

Before proceeding to the construction of physical models, the revealed regularities, we propose to perform some transformation of the "E-CODE" (table and three-dimensional graph) into another kind, in which it will be easier for us to analyze the revealed regularities and select physical and mathematical models for them.

The algorithm for transforming the isotope cloud is quite simple. Above we have already noted that the first isotope in each line (the isotope group of one element) is the blue isotope formed as a result of the addition of a proton, and the subsequent cells in the line are isotopes formed as a result of the addition of neutron (we called them isotopes-protons and isotopes -neutrons, respectively).

During the transformation of the cloud, we "moved" the isotopes-proton of all isotope groups (chemical elements) to one vertical graph (gr.1), while the next column (gr.2) got the isotope-neutrons following directly behind the isotope-proton , followed by second isotopes-neutrons of groups (gr.3), third isotopes-neutrons of groups (gr.4), etc.

The table of clouds of isotopes in a transformed form became more compact and it was possible to place it on one page (see Table 11). In it, the neutrons accumulated in the nucleus before the formation of a new chemical element are, as it were, taken out "beyond the brackets" - see the first column of the table. The second column of the table shows the number of protons in the element (parameter Z), in the third column of the table - the designation of the chemical element of a given horizontal row of isotopes. Then follows the graph, with isotopes-protons of all elements (gr.1), and then the graphs with isotopes-neutrons of these elements (gr.2, gr.3, gr.4, etc.).

The coloring of isotopes in the transformed table is mainly preserved:

The isotopes main-stream are marked in brown in the transformed table.

In blue, proton isotopes are indicated (two proton isotopes lying on the main stream, 1H b 3He are colored brown).

Lilac and light blue colors indicate the wave process of the number of bursting mu-neutrinos. Considering that the isotopes-proton in the initial isotope cloud were who in the lilac wave, who in the white wave, and in the transformed cloud they all gathered in one column, as a result, the lilac and light blue (white) isotopes in the transformed cloud are located in a distorted "Chess" order.

In yellow as well as in the initial cloud of isotopes, chemical elements with "nonstandard ladder" are designated, in which the maximum number of burst mu neutrinos falls on the third isotope in the group. As a result, in the "standard" elements, the maximum number of burst mu-neutrinos falls into the fifth column of the transformed cloud, while for "non-standard" elements the maximum number of burst mu-neutrinos enters the sixth graph of the transformed cloud. This difference between "standard" and "nonstandard" chemical elements must be taken into account when constructing an algorithm (code) for calculating the number of burst mu-neutrinos in cloud isotopes.

Three vertical green "ravines" of the initial cloud in the transformed cloud turned into three diagonal groups with isotope discontinuities (see Table 11).

Following behind the transformed table are presented several options for mapping the transformed cloud in the form of three-dimensional graphs and histograms from different viewing angles and with different directions of the coordinate axes (Z and N).

Table. 11. The transformed table of isotope clouds (see next sheet)

		A* =	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
n в р	p	n*=	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
0	1	H	8	13	32	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	2	He	38	112	1	7	1	13	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	3	Li	7	104	32	40	12	23	1	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	4	Be	6	109	59	103	10	38	4	19	1	9	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	5	B	6	99	72	101	47	63	20	28	7	16	1	9	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	6	C	9	78	116	72	102	28	45	8	24	5	24	5	17	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	7	N	7	111	82	109	58	60	15	33	17	30	13	26	8	11	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	8	O	6	93	126	73	86	24	45	23	42	22	38	16	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	9	F	6	120	78	92	51	58	37	45	30	42	22	25	7	9	1	6	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	10	Ne	9	85	105	64	92	38	57	29	49	24	31	9	22	8	18	3	10	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	11	Na	6	106	78	94	61	68	39	50	32	38	21	25	14	22	10	14	3	8	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	12	Mg	6	122	81	106	72	90	41	61	36	47	21	36	14	33	13	24	5	17	3	14	1	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	13	Al	7	83	106	82	93	63	72	43	52	32	40	24	31	15	30	13	23	12	16	2	10	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	14	Si	10	90	115	82	104	73	94	47	59	37	51	26	42	15	35	13	31	13	26	1	19	1	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	15	P	6	113	87	108	80	98	62	68	44	56	35	47	20	38	22	35	19	30	11	19	11	14	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	16	S	10	90	117	84	104	72	82	48	63	39	55	25	45	25	43	24	38	14	30	13	24	6	17	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	17	Cl	6	110	92	107	79	86	63	70	48	57	34	45	33	44	32	41	24	35	25	22	14	18	7	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	18	Ar	10	92	118	84	93	70	84	49	65	37	55	34	52	32	49	29	45	24	33	15	25	9	19	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	19	K	7	111	89	97	79	85	66	72	43	56	42	53	41	49	39	46	26	35	18	27	14	22	9	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	20	Ca	13	91	104	81	93	73	86	47	63	44	61	41	57	41	55	29	36	25	27	20	23	14	20	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	21	Sc	6	96	87	95	79	89	64	67	54	62	49	59	46	56	34	38	30	30	27	20	22	20	15	17	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	22	Ti	14	86	101	82	96	68	89	53	72	49	64	45	60	36	44	31	38	24	30	16	30	15	26	13	23	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	23	V	6	95	88	98	78	87	73	71	58	64	52	61	41	47	34	41	28	35	24	28	21	28	18	26	15	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	24	Cr	14	89	106	75	101	72	89	58	71	51	66	44	54	35	46	30	41	24	37	22	35	19	32	16	29	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	25	Mn	7	102	84	98	83	90	72	75	58	66	50	57	41	48	36	43	33	36	26	36	25	34	21	30	19	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	26	Fe	6	112	85	107	79	98	76	89	59	73	52	62	43	56	37	49	32	45	27	41	24	38	24	31	19	32	19	30	0	0	0	0	0	0	0	0	0	0	0	0	0
20	27	Co	6	81	105	86	99	81	92	74	77	56	63	48	58	42	52	37	47	34	42	28	39	25	38	21	35	20	33	19	30	0	0	0	0	0	0	0	0	0	0	0	0
20	28	Ni	6	83	114	86	105	81	98	78	91	57	67	50	63	44	59	38	53	34	50	33	43	26	40	24	38	23	37	21	33	19	32	0	0	0	0	0	0	0	0	0	0
23	29	Cu	6	97	89	98	82	92	68	70	56	65	49	60	44	55	40	51	36	46	30	44	29	41	29	35	28	32	24	32	13	0	0	0	0	0	0	0	0	0	0	0	0
24	30	Zn	11	90	103	83	96	72	82	57	71	51	65	44	61	39	56	36	51	33	49	30	47	27	43	27	38	24	36	14	25	12	0	0	0	0	0	0	0	0	0	0	0
25	31	Ga	6	91	88	99	77	83	71	69	57	66	51	62	46	57	43	52	37	51	36	47	33	43	33	39	27	39	19	25	17	23	14	0	0	0	0	0	0	0	0	0	0
26	32	Ge	7	91	103	77	91	70	85	56	73	50	68	46	64	41	59	38	56	37	52	34	48	32	45	28	41	20	31	17	28	15	23	10	0	0	0	0	0	0	0	0	0
27	33	As	6	92	82	93	76	85	69	73	57	67	52	64	47	60	44	57	41	54	39	49	37	47	33	43	24	30	22	28	20	23	14	20	13	0	0	0	0	0	0	0	0
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32	35	Br	6	70	87	72	75	55	70	54	66	51	61	46	59	44	56	42	53	38	49	29	35	28	33	24	28	18	26	17	24	17	24	0	0	0	0	0	0	0	0	0	0
33	36	Kr	14	95	73	83	59	76	56	70	51	67	46	63	44	61	42	58	40	55	31	39	29	35	25	31	19	29	17	29	17	28	16	27	0	0	0	0	0	0	0	0	0
34	37	Rb	6	67	88	76	73	62	68	56	66	52	63	49	60	49	58	48	55	34	40	32	36	29	33	23	30	20	29	23	27	22	28	17	0	0	0	0	0	0	0	0	0
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37	39	Y	6	88	75	76	60	71	57	67	55	65	53	65	52	63	38	44	37	42	35	39	30	34	25	33	29	32	29	29	23	26	20	23	18	0	0	0	0	0	0	0	0
38	40	Zr	20	75	89	61	76	57	72	54	70	53	68	52	66	40	48	38	46	36	44	32	36	26	39	28	36	27	34	24	31	21	29	18	27	0	0	0	0	0	0	0	0
40	41	Nb	6	72	77	61	73	59	68	55	70	56	66	44	49	40	47	39	45	34	38	32	40	31	39	28	38	25	33	22	31	21	29	19	26	0	0	0	0	0	0	0	0
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71	65	Tb	6	69	59	69	57	67	59	63	55	64	55	61	44	50	43	48	40	48	39	51	39	49	38	45	36	43	35	39	31	37	29	35	27	32	25	30	0	0	0	0	0
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73	67	Ho	6	68	62	71	61	66	58	68	57	65	46	54	45	53	43	52	41	53	42	51	40	49	39	47	37	44	35	41	33	38	31	36	28	33	26	30	0	0	0	0	0
75	68	Er	15	75	60	72	58	70	56	67	47	57	45	56	43	56	41	55	41	53	40	51	39	49	37	47	36	43	34	41	32	38	30	36	27	33	25	0	0	0	0	0	0
76	69	Tm	6	56	72	61	71	59	67	50	57	47	57	46	55	45	55	44	54	43	52	40	51	39	48	38	45	37	42	35	39	32	37	29	35	27	31	0	0	0	0	0	0
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79	71	Lu	6	68	62	72	51	61	51	60	49	58	48	57	46	55	44	55	43	53	42	50	41	48	39	46	38	43	35	40	34	36	32	34	30	32	28	0	0	0	0	0	0
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82	73	Ta	6	49	66	52	63	53	60	51	60	49	59	46	57	45	55	44	53	43	51	41	48	39	47	38	44	37	42	34	39	32	37	30	35	29	34	28	0	0	0	0	0
84	74	W	16	53	67	51	64	50	63	48	61	46	60	45	58	44	56	43	53	42	50	40	49	39	47	37	45	35	41	32	40	31	38	28	39	28	37	0	0	0	0	0	0
85	75	Re	6	63	53	65	54	61	51	61	50	59	48	57	46	56	46	54	44	51	42	50	41	49	39	47	36	43	35	41	33	39	32	38	31	37	30	0	0	0	0	0	0
86	76	Os	13	54	68	51	65	51	64	49	62	47	61	46	59	46	56	44	54	42	52	41	51	40	48	37	46	35	44	33	43	32	42	32	40	30	37	0	0	0	0	0	0
87	77	Ir	6	62	53	66	54	62	52	62	51	60	48	59	47	57	46	55	44	53	43	51	42	49	39	47	37	46	36	45	35	43	34	40	33	39	32	37	0	0	0	0	0
88	78	Pt	11	54	69	52	66	51	64	49	63	47	62	47	59	46	57	45	55	43	53	41	51	39	51	38	49	36	48	35	46	34	44	33	42	31	41	30	39	0	0	0	0
90	79	Au	6	46	66	54	64	52	62	51	61	49	59	48	57	47	55	46	53	44	52	41	52	41	50	39	48	39	47	37	45	37	42	35	40	34	38	32	34	0	0	0	0
91	80	Hg	9	70	53	67	52	65	50	64	48	63	47	61	46	59	44	58	43	56	42	54	41	53	40	51	39	49	38	47	37	45	35	43	34	42	32	38	19	28	19	28	0
95	81	Tl	6	61	53	64	51	63	48	62	47	60	47	57	44	57	43	55	43	53	42	52	41	49	40	48	40	46	38	44	37	42	36	38	22	28	21	28	21	0	0	0	0
96	82	Pb	11	53	66	51	65	49	64	48	62	47	60	45	59	44	57	43	56	42	54	42	52	41	50	40	49	39	47	38	45	38	41	23	29	22	29	21	29	20	0	0	0
101	83	Bi	6	57	50	62	49	60	49	58	47	57	46	56	45	54	43	53	43	51	41	49	40	47	39	45	39	42	26	29	25	29	23	30	22	29	21	0	0	0	0	0	0
104	84	Po	16	50	62	48	61	46	59	45	58	44	56	44	54	43	52	42	50	40	49	39	47	39	43	26	34	25	33	24	32	23	32	21	31	0	0	0	0	0	0	0	0
108	85	At	6	49	57	47	58	47	57	46	55	44	53	43	51	42	49	41	47	40	43	29	34	28	34	26	33	25	33	24	32	23	31	0	0	0	0	0	0	0	0	0	0
109	86	Rn	14	62	48	59	46	58	45	57	44	55	43	52	42	50	41	49	40	44	29	38	28	37	27	37	25	35	24	35	24	33	23	33	22	32	22	0	0	0	0	0	0
112	87	Fr	6	47	59	47	57	46	55	45	54	44	51	43	49	42	45	31	38	31	38	30	37	30	35	28	34	27	33	26	33	25	31	25	30	23	0	0	0	0	0	0	0
114	88	Ra	17	48	59	46	57	45	55	44	52	43	50	42	46	32	41	31	41	30	40	30	38	29	36	28	36	26	35	25	34	24	33	23	32	0	0	0	0	0	0	0	0
117	89	Ac	6	58	47	55	45	54	45	51	43	47	34	42	33	41	33	41	34	38	32	37	31	37	29	35	29	34	28	32	26	31	25	0	0	0	0	0	0	0	0	0	0
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125	92	U	21	49	38	46	37	46	37	46	36	45	36	44	34	43	33	41	33	38	30	37	29	35	27	33	26	32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
132	93	Np	16	39	46	39	45	37	43	36	42	34	39	32	37	31	35	29	34	28	32	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
134	94	Pu	29	38	47	38	45	36	43	35	41	33	39	32	37	30	35	29	34	27	33	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
136	95	Am	18	40	46	38	44	37	43	35	40	34	37	31	36	30	34	28	33	27	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
137	96	Cm	27	48	39	45	37	44	35	42	34	39	32	38	31	36	29	35	27	33	25	32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
138	97	Bk	16	41	47	39	45	38	43	36	40	34	39	33	37	31	35	28	33	27	32	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
139	98	Cf	24	48	40	46	38	45	36	42	35	41	34	39	32	37	29	35	27	34	26	33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
141	99	Es	15	47	39	46	38	43	37	41	36	40	34	38	30	36	29	34	28	33	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
142	100	Fm	23	40	46	38	45	37	43	36	42	35	40	31	37	29	36	28	35	27	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

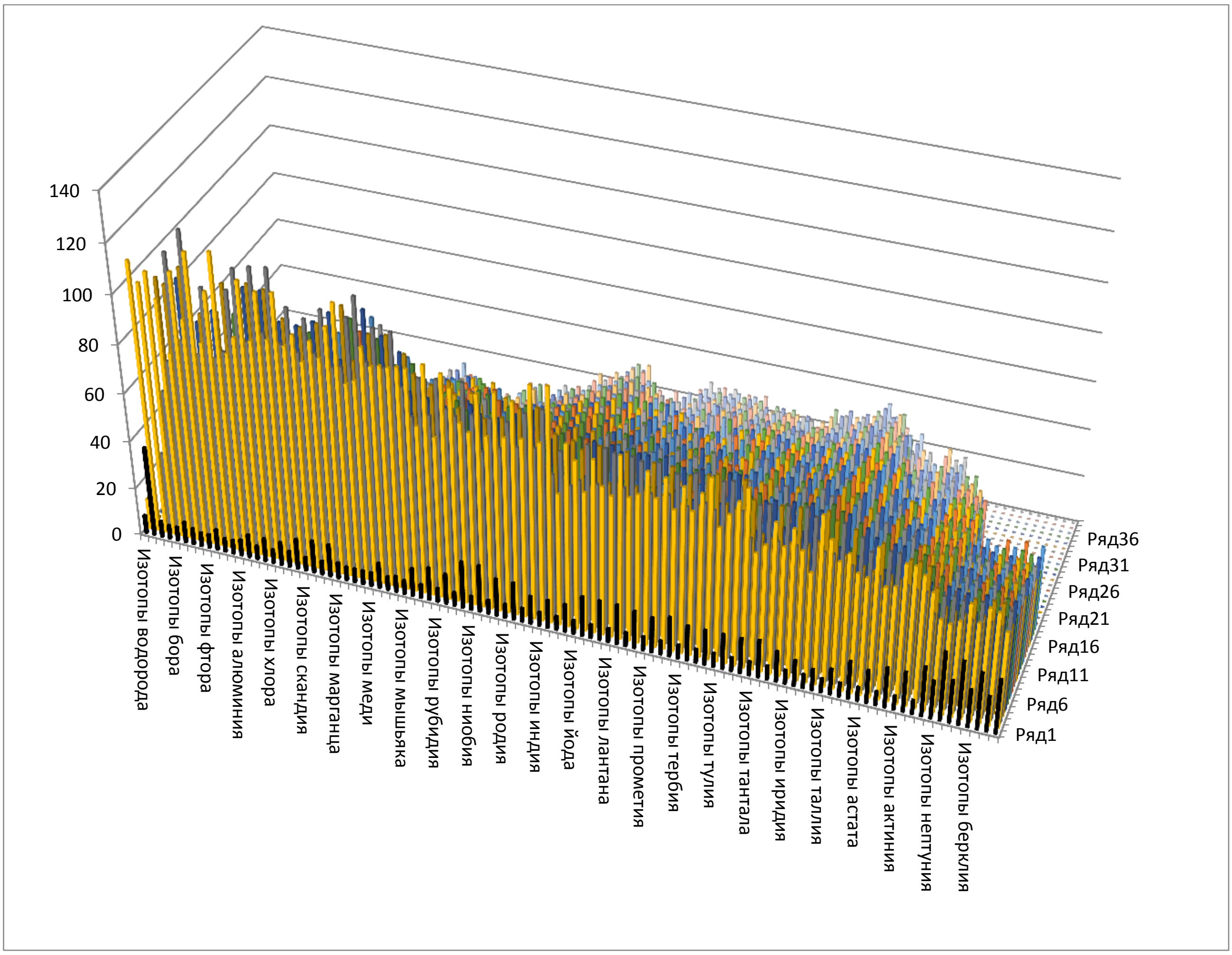


Fig. 7_14. The histogram of the transformed isotope cloud is a "left-top" view

(ranks of data are selected along the proton axis). Well is view the ratio of the number of burst mu-neutrinos in the first graph of isotopes-proton (a dark ranks of data) and in the following isotope-neutrons with the maximum number of burst mu neutrinos

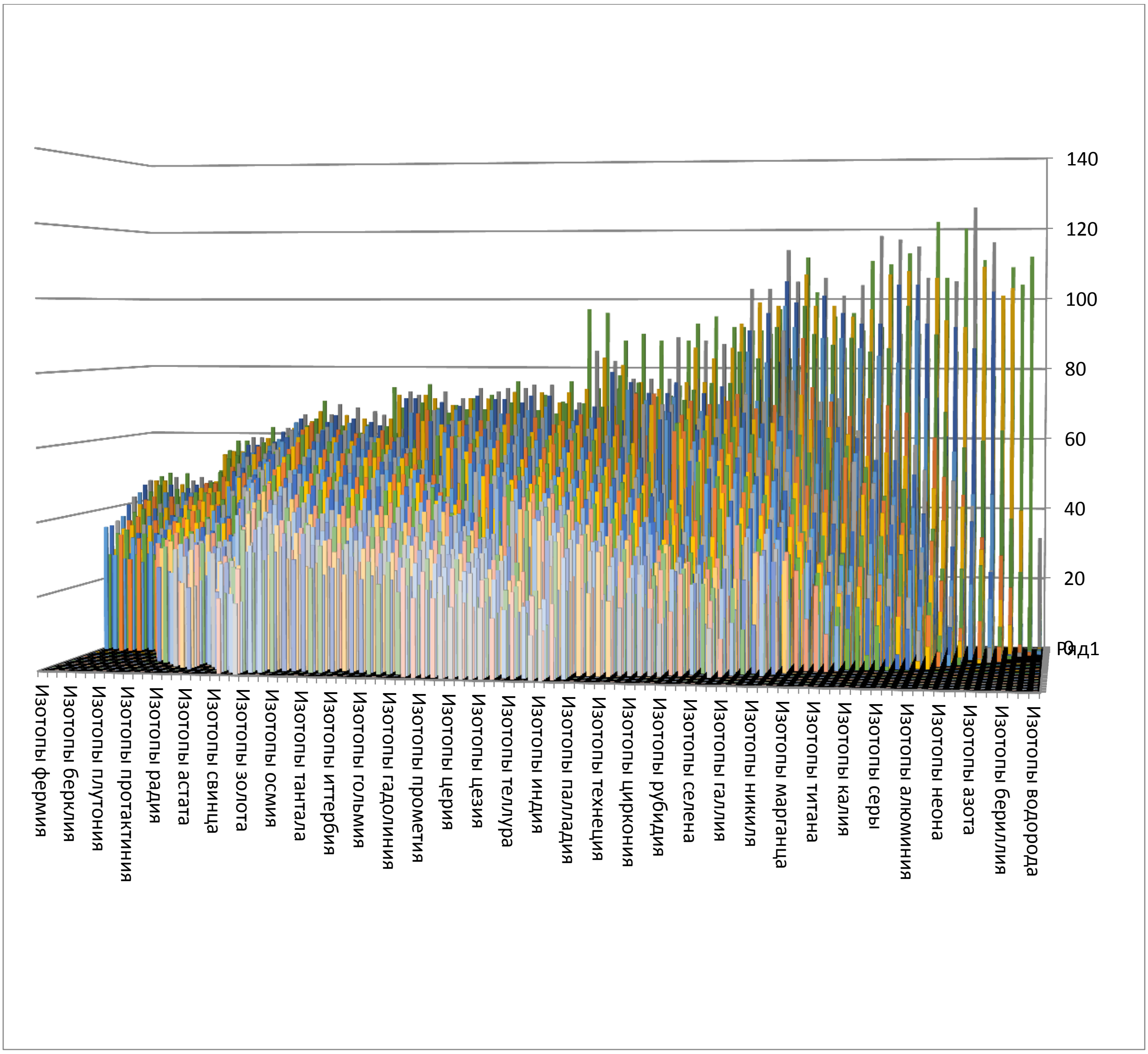


Fig. 7_15. The histogram of the transformed cloud of isotopes ("hedgehog" or "porcupine") is a "right-top" view (ranks of data are selected along the proton axis). Three vertical "ravines" of the original cloud are quite clearly visible, which have become diagonal in the transformed cloud

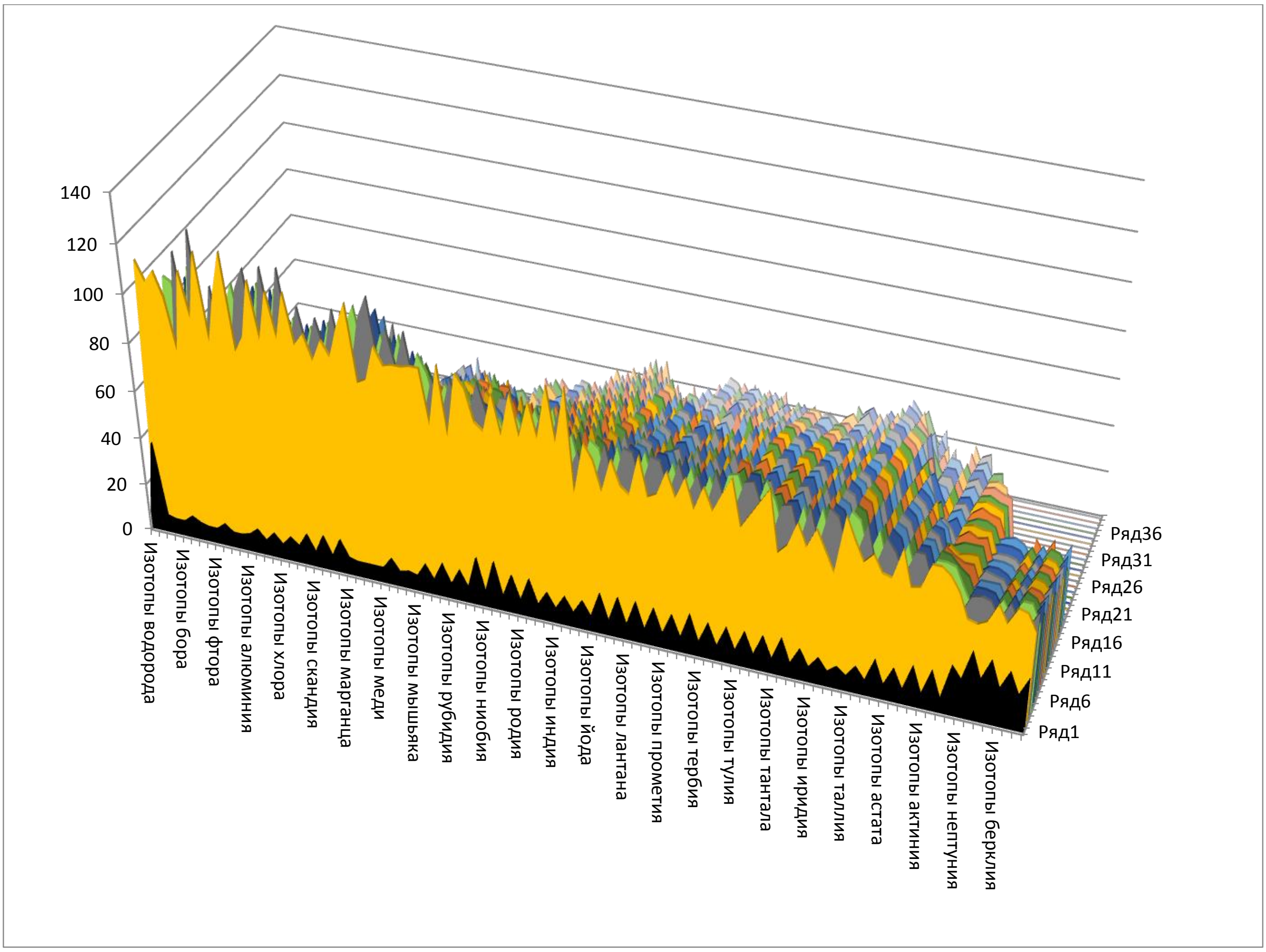


Fig. 7_16. The three-dimensional graph of the transformed isotope cloud is a "left-top" view (ranks of data are chosen along the proton axis). The ratio of the number of burst mu neutrinos in the first graph of isotopes-proton (a dark series of data) and in the following isotopes-neutron with the maximum number of burst mu-neutrinos is clearly visible. Orange peaks correspond to the second graph of isotopes-neutron of "standard" elements, green peaks correspond to the third graph of isotopes-neutron "non-standard" elements

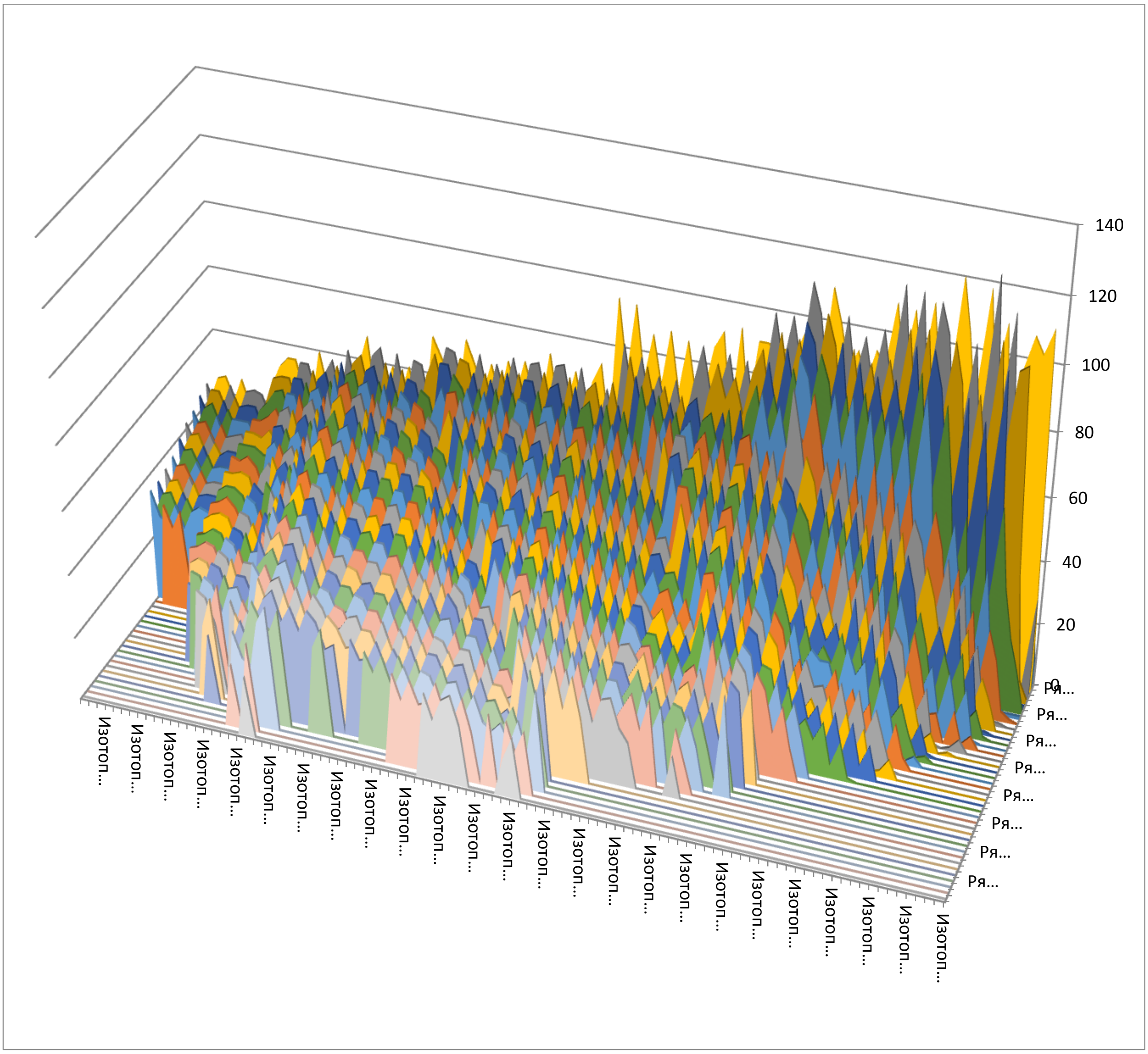


Fig. 7_17. The transformed cloud of isotopes in the form of a three-dimensional graph "Right-top" view (ranks of data are selected along the proton axis). The mosaic of colors clearly shows the alternation of "standard" and "non-standard" series of chemical elements

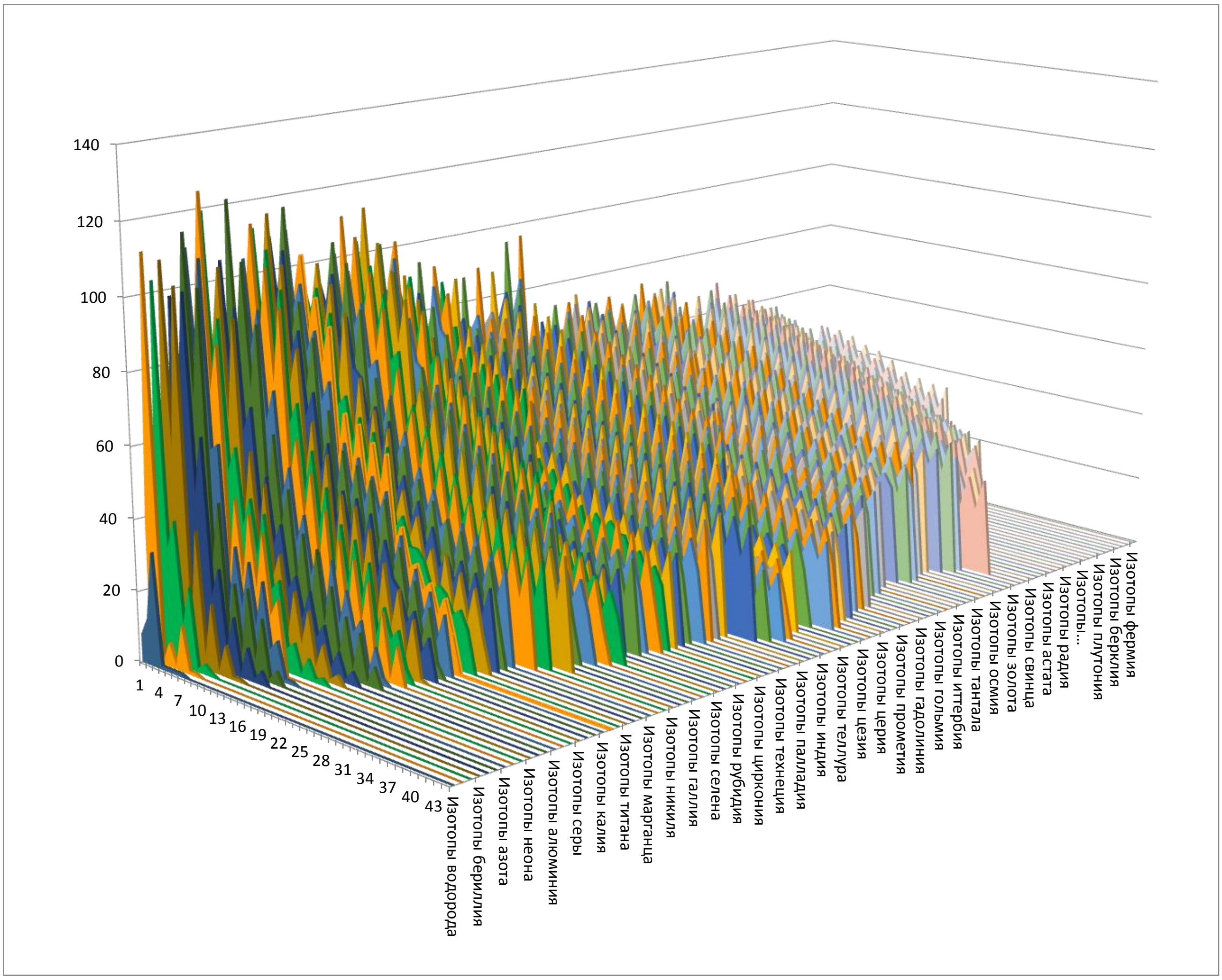


Fig. 7_18. The transformed cloud of isotopes in the form of a three-dimensional graph "Bottom-right and slightly above" view (ranks of data are selected along the neutron axis and mirrored). Wave-like "stairs" of reducing the number of mu-neutrino bursts in isotope groups of one element are very clearly displayed

The table, histograms and three-dimensional graphs in the concentrated form show all the patterns and "nuances" of the number of bursting mu-neutrinos in the primary nr_nucleosynthesis. True, individual columns of histograms and ranks of graphs overlap each other, as a result, some information is lost on them. You can restore it by returning to the tabular representation of the source and transformed cloud of isotopes.

On the resulting three-dimensional graphs and histograms, we clearly see already noted by us, as well as new patterns of the change in the number of burst mu-neutrinos in different sections of the isotope cloud, namely:

1) A significantly smaller number of burst mu-neutrinos in isotopes-proton compared with the maximum number of mu-neutrinos that burst after the following isotope-neutrons.

2) The subsequent wave-like decrease in the number of burst mu-neutrinos inside the isotope groups of one chemical element ("ladder").

3) Three "ravines" intersecting a cloud of isotopes in vertical sections corresponding to the number of neutrons in isotopes equal to 51, 83, 127 pcs.

4) The resulting three-dimensional graphs and histograms of the transformed cloud resemble halves of "bread crusts" ("loaves of bread") with some "scallop" formed by them, formed by the first isotopes of the cloud (Fig. 7-15 also recalls a hedgehog).

In addition, this can be demonstrated by a pair of vertical sections of the transformed cloud corresponding to the maximum number of burst mu-neutrinos in the groups and the number of burst mu-neutrinos about in the middle of the transformed cloud, see Fig. 7_19.

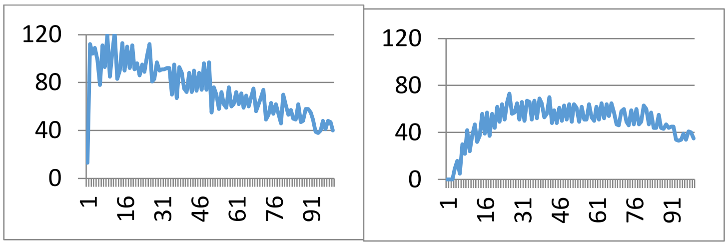


Fig. 7_19. "Scallop" and "bread crust" ("hedgehog")

The decrease in the number of burst mu-neutrinos at the end of the cloud of isotopes can indirectly indicate the convergence of this process, i.e. the presence of a theoretical isotope at the isotope cloud - an island of stability (formed by S_theory as a result of the magnetic "snapping" of the two ends of the long "sausages" of isotope nuclei convolved into a "tangle").

It should also be noted that, starting with oxygen, the "stairs" of the bursting mu-neutrinos do not reach zero, but break off at a certain height. This indicates that these elements (oxygen and further) in the reference cloud lack the last isotopes in the groups (they are not yet discovered experimentally or theoretically). I.e. the reference cloud of isotopes is not complete in "width" (coordinate N). In accordance with the proposed S-model, it is not difficult to calculate them by extrapolating the "ladder" of these elements before crossing them with the plane Z0N. When constructing a theoretical "key," we will have to do this in order to determine the theoretical boundary of the isotope cloud, which will participate in our calculations.

But first we need to give a physical explanation of the revealed regularities.

Physical models of the regularities of the number of bursting mu-neutrinos

The construction of the physical models of the revealed regularities of the bursting mu-neutrinos will be carried out in the following order:

1. "Clamps" - the regularity of a reduced number of bursting mu-neutrinos at the addition of isotopes-protons and an increased (maximum) number of bursting mu-neutrinos at the addition of isotopes-neutrons following protons.

2. "Waves" is a wave-like process of increasing and decreasing the number of bursting mu-neutrinos with an increase in the number of neutrons in the isotope. The maximums of the number of bursting mu-neutrinos correspond to an even number of neutrons in the isotope. The minimums of the number of bursting mu-neutrinos correspond to an odd number of neutrons in the isotope.

3. "Mountains" - the process of reducing the number of bursting mu-neutrinos with increasing number of neutrons (without taking into account "clamps" and wave-like process) and monotonous growth of the number of bursting mu-neutrinos with an increase in the number of protons (excluding "Clamps").

"Clamps"

We have already noted this pattern in the analysis of the isotope cloud table, when gave examples "ladder with legs" of various sections of the isotope cloud led. This regularity can be generalized in the form of the following graph (see Fig. 7_20), which shows the number of burst mu-neutrinos in education all isotopes-proton (blue line P) and in education the immediately following isotopes-neutron (red line Max).

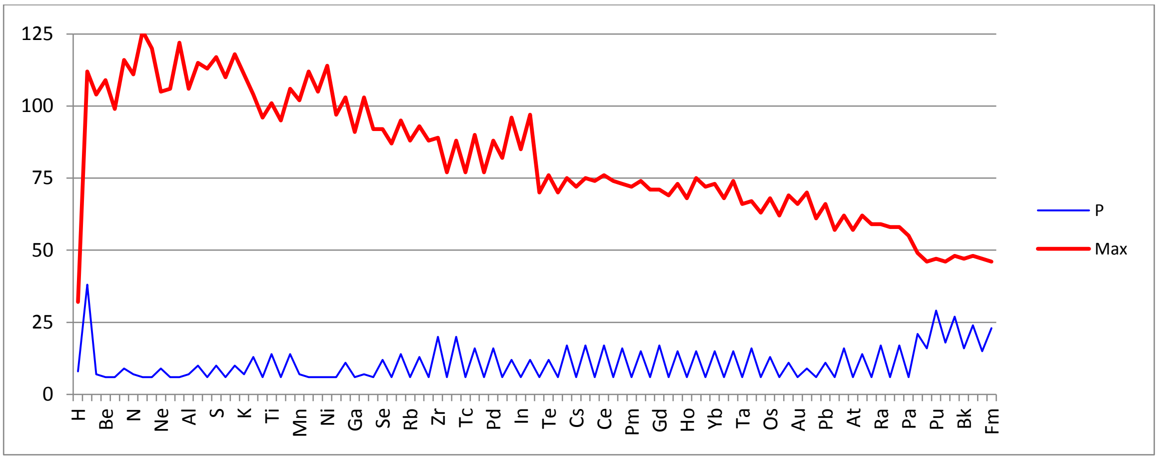


Fig. 7_20. "Clamps" is the number of bursting mu-neutrinos with the addition of protons (the blue thin line is P) and with the addition of neutrons following them (the red thick line is Max)

As you can see, the red line is always much higher than the blue line. What explains this regularity?

To begin with, we note that, from the point of view of strong-interaction forces , the nucleons (protons and neutrons) are exactly the same. The slit magnets of the proton and neutron do not differ from each other in any way. But the result of attaching them to the core is very different. Why?

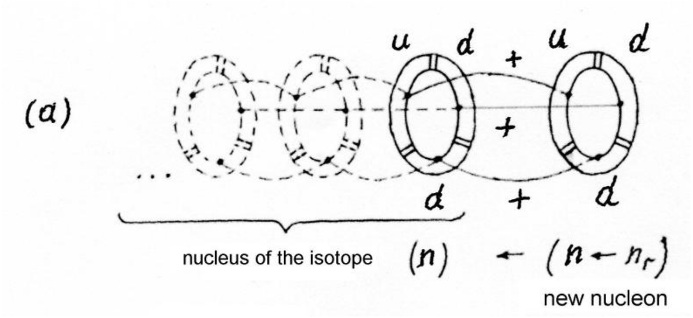
To answer this question, we need to disassemble all variants of relic neutron attachment to the nucleus of the previous isotope. At once want to note that the initial process of approaching the relic neutron and the nucleus of an isotope occurs under the action of the Brownian motion of the relic neutron and the nucleus of the isotope.

At some relatively distant distance, the attraction forces generated by the dipole moments of the relic neutron and the nucleus of the isotope begin to act on them. What is important, this attraction force additionally unfolds the incoming relic neutron and the core of the isotope in such a way that the directions of their dipole moments coincide. This determines the mutual orientation of the magnetic moments of the slit magnets of the relic neutron and the last nucleon of the nucleus of the isotope, to which the relic neutron will be mooring.

Next, at a short distance, the magnetic moments of the slit magnets of the relic neutron and the last nucleon of the isotope come into operation. But further various variants are possible depending on the type of nucleon in which the relic neutron transforms into and to which type of nucleons it will be mooring.

<u>Option 1 (relic neutron "moored" to a neutron and itself turns into a "simple" neutron).</u>

With the order of formation of the isotope clouds ("Horizontal Algorithm") chosen by us, the overwhelming majority of relic neutrons, on the order of 97%, is attached with by this variant. In this case, the directions of all three pairs of slit magnets of both conjugate neutrons will coincide and they will be attracted to each other. The relic neutron, revolving around its central axis, very quickly occupies a position when its quarks and slit magnets will be located opposite to the quarks and slit magnets of the last neutron of the isotope, with all three magnetic vectors of the slit magnets coinciding. All three pairs of slotted magnets will work on the attraction and the resulting neutron will join co-axially with the previous neutron of nuclei on all three magnetic "latches", see Fig. 7_21 (a). The figure shows only the rings (bagels) of the "hoops" of quarks, the mu- and tau- neutrino bagels are not conditionally depicted. The "+" sign indicates the work of the flagellums of gluons for attraction, the sign "-" for repulsion.



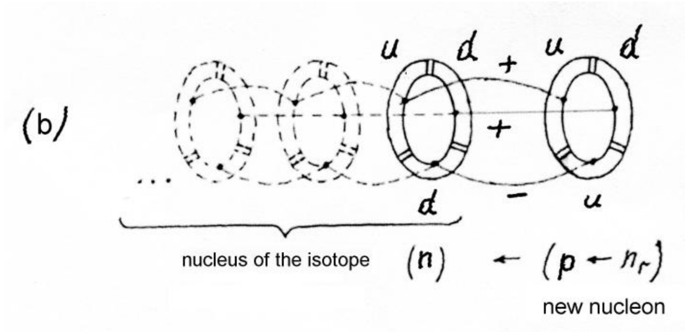


Fig. 7_21. (a) - a relic neutron "moored" to a neutron and itself turns into a "simple" neutron (strong coupling), (b) - the relic neutron "moored" to a neutron and it turns into a proton (weak bond)

Option 2 (Relict neutron "moored" to a neutron, and itself turns into a proton

In the second variant, about 3% of relic neutrons are added in the Horizontal algorithm. As a result of such an addition, isotopes of new chemical elements are formed.

When a relic neutron is converted into a proton, only two pairs of slit magnets will work for attraction, and the third pair, in which the quark d is replaced by the quark u, will work for repulsion. As a result, the proton joins the core not co-axially with the previous neutron, but with a certain kink in the core axis, see Fig. 7_21 (b). This circumstance substantially reduces the force of attraction of the proton to the nucleus of the isotope, which explains the reduced number of bursting mu-neutrinos.

"In principle," the proton formed could connect with the neutron of the isotope and all three magnetic latches, if it slightly "jumping off" and rolled over. But the transformation of the relic neutron into a proton occurs with direct contact of nucleons and their compression, which leads to deformation of the mu-neutrinos and their bursting. At this point, two unidirectional slotted magnets have already "snapped" and do not allow the proton to "jump off" and turn around. By the way, it is worth mentioning that the orientation of their dipole moments has remained the same.

Initially, we generally doubted the strength of such a connection (+ 2-1 = 1, i.e the affiliated proton is withheld by the SIF, that are equivalent to the attraction of only one pair of slotted magnets). And what will happen with the further growth of the nucleus, when external forces will be act on such a connection? If this connection is not strengthened, it must certainly burst. What will happen to isotopes and to our world in this case is not difficult to imagine. Without strengthening the weak link, formed when the proton was added, the world "does not survived". And the strengthening comes in the form of the next (second) relic neutron. How?

Strengthening the weak coupling of the proton with the neutron of the nucleus

Before answering the question of how the next relic neutron strengthens the connection between a proton and a neutron, we need to find out - how a new relic neutron will join the nucleus and into what nucleon it will turn into.

It is quite obvious that the new relic neutron flies to the core of the isotope with the same orientation of the dipole moment as the proton and the neutron. But, in this case, only two magnetic moments of the slit magnets (one quark u, and one quark d) coincide in direction with the proton. And for the second quark d of the relic neutron and the second quark u of the proton, the magnetic moments of the slit magnets will have the opposite direction and will be repelled, i.e. The relic neutron is triggered by an additional force that tries to deploy it. At this point, the relic neutron has not yet entered into a "mechanical" contact with the proton and has not become either a "simple" neutron or a proton, it has not yet experienced deformation and the mu-neutrinos have not bursted. It has not yet been pressed to the extreme proton of the isotope, the magnetic latches have not snapped, there is still a gap between them, and the forces of the magnetic moments of the slit magnets already act on the relic neutron and create a torque (see Fig. 7_22).

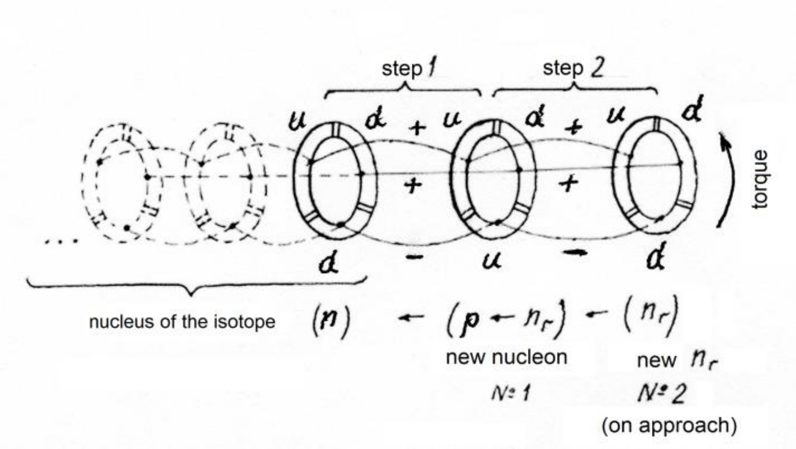


Fig. 7_22. "Approaching" the second relict neutron to the proton (generation of torque)

This is where the decisive moment comes in, which determines will be whether a strong or weak connection is established between the new nucleon and the last proton of the nucleus. The final decision is affected by two circumstances:

1. Whether or not the relic neutron will have time to turn around before pressing the relic neutron to the proton and starting the process of mu-neutrino bursting and transforming the relict neutron into an ordinary neutron or proton.

2. In what type of nucleon the relic neutron will turn into.

And again we have to disassemble the work of slotted magnets, which we have already done many times, only now with new additional circumstances (sub-variants). There are four possible sub-variants. Two of them, when the relic neutron turns into a proton, we will consider a little lower (they do not strengthen the weak connection, but do not hinder its strengthening in the future). Consider the other two sub-variants, when the relic neutron turns into a simple neutron.

<u>Sub-option 2.1. (the second relic neutron manages to turn over and turns into a neutron</u>

If the relic neutron manages to turn over to the proton by another "sideways" and remains a neutron, then rotating around its central axis, the relic neutron will quickly find a position when the directions of the magnetic moments of all three slit magnets coincide. It is true that the slit magnets of two quarks and protons will mate with the slit magnets of two quarks d of the relic neutron, and in the third pair the slit magnets of the quark d of the proton and the quark u of the relic neutron will be conjugated. A very strong connection was obtained between the new neutron and the proton that preceded it. But the connection between the proton and the previous neutron in the nucleus will remain "weak" and, with the slightest external influences, must necessarily collapse (see Fig. 7_23).

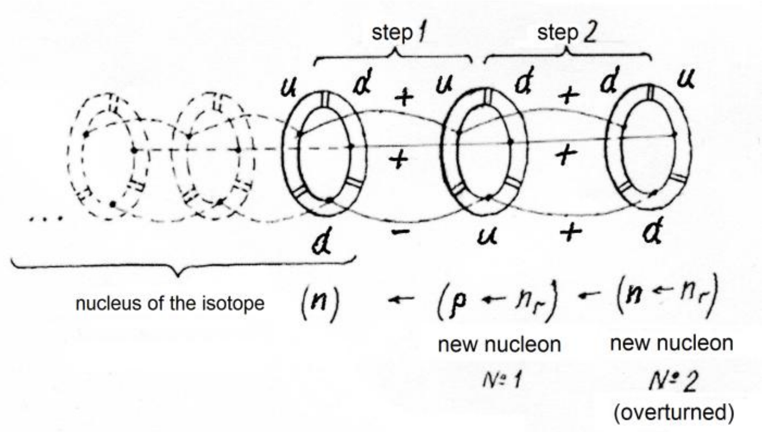


Fig. 7_23. Sub-option 2.1. coaxial attachment to the proton of the second relic neutron turned into a neutron (with a coup of relic neutron) - direction the magnetic moments of the slit magnets are not conditionally shown, for nucleon No. 2 after its they also turned over, so the quarks u and d attract

We draw a conclusion: this sub-option is "not operable", because in its result unstable isotopes are formed.

<u>Sub-option 2.2. (the second relic neutron does not have time to turn over and turns into a neutron</u>

In this case, the relic neutron will be pressed against the proton by the same side that initially determined their dipole moments. The magnetic moments will coincide only for two pairs of slit magnets, and for the third pair the magnetic moments will not coincide. As a result, only two magnetic latches will snap, and the third pair of slit magnets will be repelled. A weak not coaxial connection is again formed. In total, we obtained two weak not coaxial bonds in a row one by one(see Fig. 7_24).

<u>Comment:</u>

This sub-option is quite real if the forces_SIF from the slit magnets of the relic neutron and proton begin to act and try to deploy the relic neutron at too close distance from each other, and the speed of their convergence is significant. The relic neutron does not have time to turn over, its contact with the proton occurs, the relic neutron are deforms, the mu-neutrino are bursts, it turns into a "simple" neutron, and the two magnetic latches snap.

In this sub-option, the formed "simple" neutron will be repelled by one pair of slit magnets from the proton (weak coupling), but for this new neutron and the neutron preceding the proton, the directions of the magnetic moments coincide in all three pairs of slit magnets, including slot magnets, which "conflict" with the third slit magnet of proton. It must be thought that the distance between neutrons (separated by a proton) still allows them to establish a SIF bond among themselves. Then the third slit magnets of these neutrons "throw" each other an additional flagellum of gluons and will attract each other. As a result, the proton, located between them, falls into a kind of "clamps" (see Fig. 7_24).

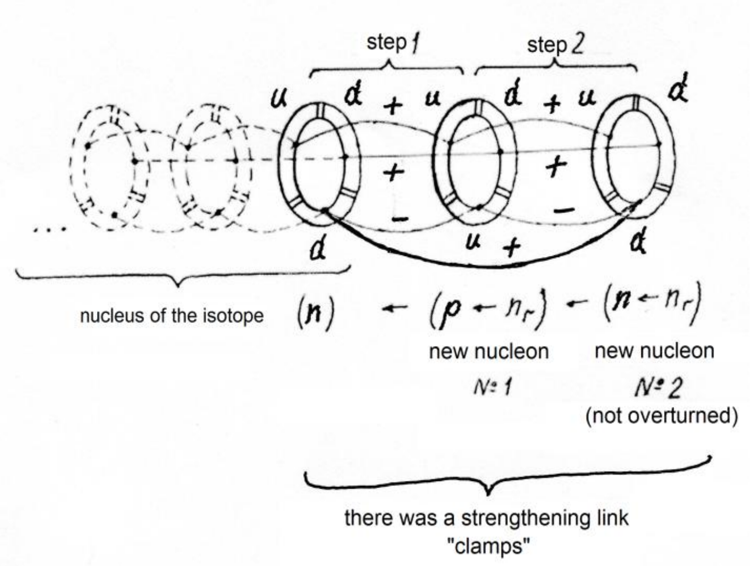


Fig. 7_24. Sub-option 2.2. not co-axial attachment to the proton of the second relic neutron, which turned into a neutron (without a revolution). The proton was trapped in a "clamps" between two neutrons.

Such "clamps" will strengthen the strength of compound of nucleons in the nucleus, disturbed by the addition of a proton, and in doing so, for sure, will lead to an increased number of bursting mu-neutrinos inside the proton and two neutrons forming "clamps". It is precisely such a picture of the number of bursting mu-neutrinos that we observe in Fig. 7_20.

It should also be noted that the "clamps" partially straighten the fracture of the axis of the nucleus, formed when the proton is attached, but not completely, because "Under them" are two pairs of mutually repulsive slit magnets.

<u>We make a conclusion for sub-option 2.2:</u> When a relic neutron is attach to a proton, the relic neutron does not have time to turn around and is joins the nucleus while maintaining the initial (coherent) orientation of the dipole moments. As a result, "clamps " are formed, explaining the reduced number of bursting mu-neutrinos with the addition of a proton and an increased number of bursting mu-neutrinos upon the addition of a neutron following it.

The graphs shown in Fig. 7_14, clearly demonstrate the result of the operation of "clamps " in the places where the protons are attached and the neutrons following them. The unevenness of this result for individual chemical elements can only be explained at the level of the standing gluon wave (SGW) , which we can not currently do.

<u>Note:</u> In addition, one should bear in mind that "clamps " are formed also when the triple of nucleons is combined in the following order - pnp (i.e proton-neutron-proton). This can be easily verified by carrying out analogous arguments for a given sequence of nucleons.

<u>Option 3 (The relic neutron "moored" to the proton and turns into a proton itself, followed by a neutron).</u>

There are only six variants in which the relic neutrons joining in the formation of the isotope cloud in this way. These are nucleon chains when two successive protons "clamped in pincers" between two neutrons. These are the following chains of nucleons (in parentheses we denoted them by the names of the isotopes that are formed when they are attached). Protons in this case we identified in bold:

n(2H)-**p(3He)-p(4Li)-**n(5Li), n(17Ne)-**p(18Na)-p(19Mg)**-n(20Mg),

n(20Mg)-**p(21Al)-p(22Si)**-n(23Si), n(43Cr)-**p(44Mn)-p(45Fe)**-n(46Fe),

n(46Fe)-**p(47Co)-p(48Ni)**-n(49Ni), n(52Ni)-**p(53Cu)-p(54Zn)**-n(55Zn)

We already know that the second proton (in the form of another relic neutron) will fly up to the first proton (attached earlier) with the "correct" orientation of the dipole moment (it will not turn over). In it, just like the first proton, one d quark of the relic neutron turned into a u quark. Between the two protons there will be a strong co-axial coupling of all three pairs of slotted magnets. But the connections of this "couple" of protons with the two neutrons surrounding them will be weakened (one pair of slit magnets in these connections will work for repulsion).

As a result, two neutrons from two sides of the "pair" of protons, to strengthen their weak connections with protons, will have to reach out to their flagellumstes gluons to each other, squeezing two protons together. This is the difference of the third option from the second, but in fact the same "mites" with two protons inside turned out.

<u>There are also Options 4 and 5, when three or even four successive protons "clamped" in between the two neutrons.</u>

These are the following nucleon chains:

n(2H)-**p(3He)-p(4Li)-p(5Be)**-n(6Be) и n(2H)-**p(3He)-p(4Li)-p(5Be)-p(6B)**-n(7B)

These chains are taken from a real cloud of isotopes and have a full right to exist. This means that two neutrons can transfer flagellums of gluons to each other through three and four protons. We conclude that the nuclear forces of the nucleon compound in the nucleus (SIF) act at a distance of at least five nucleon thicknesses, i.e. 2,1372043457 fm. between the "hoops" of quarks (slit magnets).

<u>Option 6. The sixth option can be called "double clamps</u> ".

It consists of a chain of four pnpn nucleons, in the isotope cloud this variant corresponds to the following nucleon sequence: **p (1H)** -n (2H) -**p (3He)** -n (4He). This nucleon chain is the core of the 4He isotope (alpha particle). In it, the neutron (2H) got into the "mites" between the two protons (1H and 3He), and the proton (3He) got into "mites" between two neutrons (2H and 4He). All nucleons are very strongly pressed to each other, this explains the special "strength" of alpha particles and their wide distribution in nuclear decay reactions (the alpha particles themselves remain intact). Such reactions are called α-decay reactions.

"Double clamps " additionally testify to the ability (possibility) of four nucleons to unite into a single "bead", which was used by us in analyzing the shape of isotope nuclei.

It is necessary not to confuse the sixth variant with the fourth and fifth, although part of the nucleons they overlap. The fourth and fifth variants rather explain the very weak stability of the 6Be and 7B isotopes, since their "clamps " contain inside an increased number of protons, flagellum of gluons, "compressive" clamps are too stretched, and the compressive force SIF as any electromagnetic force is inversely proportional to the square of the distance. This conclusion is confirmed by the very little half-lives of these isotopes. However, it should be noted that in the subsequent isotopes the lifetime increases, which indicates that the subsequent newly formed flagellum of gluons further strengthens the weak connection between the third slotted magnets of the "clamps ", while additional mu-neutrinos in nucleons are burst additional .

"Waves" ("ladder" and "ladder with a leg")

After the explosive growth of the number of burst mu-neutrinos after formation of "clamps ", the process of smooth wave-like decrease in the number of burst mu-neutrinos begins upon accession nucleons-neutron are added within the isotope groups belonging to the same element. This descending undulating process we called "ladder". The totality of the two processes of "clamps " + "ladder" we called "ladder with a leg" (see Figure 7_25).

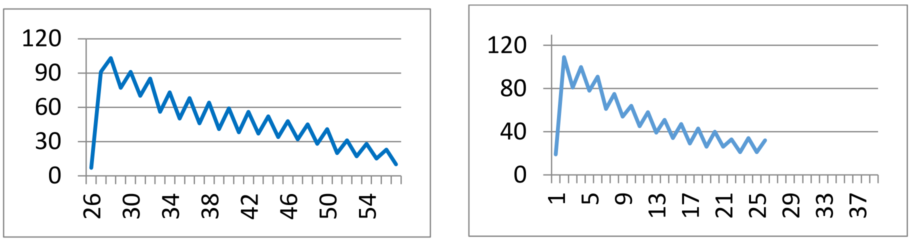


Fig. 7_25. Typical "ladder with a leg"

The physical model of "clamps " ("legs to the ladder"), we dismantled. We divide the construction of the physical model of the "ladder" into two parts, the physical model of the wave-like process ("waves") and the physical model for reducing the number of burst mu-neutrinos with an increase in the number of neutrons ("mountains").

Now we will analyze the physical model of the "wave" - the wave-like process of changing the number of burst mu neutrinos and the occurrence of the maxima of the undulating process in vertical rows of isotopes with an even number of neutrons.

We will stage this physical model of "wave" formation step-by-step.

First (in the first stage), to simplify the problem, we consider the process of connecting a chain of neutrons with each other without the participation of protons. We have already glimpsed this process in the construction of the physical model of "clamps " (see Option 1). But there we confined ourselves to stating that the coupling of the two neutrons is carried out co-axially on all three magnetic "latches".

Now we are further interested in the question of why the successive addition of a chain of neutrons to each other within a group of isotopes of one element (without "mixing" the protons) the number of bursting mu-neutrinos varies from isotope to isotope in a wave-like manner, with the maxima corresponding to an even number of neutrons, and the minima odd number of neutrons.

We will consider the process of successive addition of neutrons to each other: 1 neutron, 2 neutrons, 3 neutrons, 4 neutrons, etc. Let's say at once that all neutrons will be co-axially aligned to all three magnetic latches, but they will still have some difference in the number of bursting mu-neutrinos.

We already did something similar in Chapter 5, when we conducted an S_ analysis of the shape of the nuclei. However, there we operated with the number of mu-neutrino bursts applied to the main-stream isotope chain, which contained both protons and neutrons. Now we are interested in a chain of nucleons, consisting exclusively of neutrons.

Let's start with a single neutron.

We are talking about a free "simple" neutron, see Fig. 7_27 (a). The question of how a single neutron was formed is left behind the brackets, although this is not a neutron "jumped out" of the isotope, nor a relic neutron, but rather a neutron formed from a relic neutron with a spontaneous minimum amount of burst mu-neutrinos. For the "purity" of the experiment, we will assume that the considered time interval (before the addition of the second neutron) is less than the decay time of the free neutron (spontaneous fall in of the mu-neutrino into the gap between two quarks). No one deforms the mu-neutrino in such a single neutron, they simply do not have to burst. We assume the number of bursting mu-neutrinos in a single neutron equal to a certain minimum value (see the graph in Fig. 7_26 - the first column of the histogram).

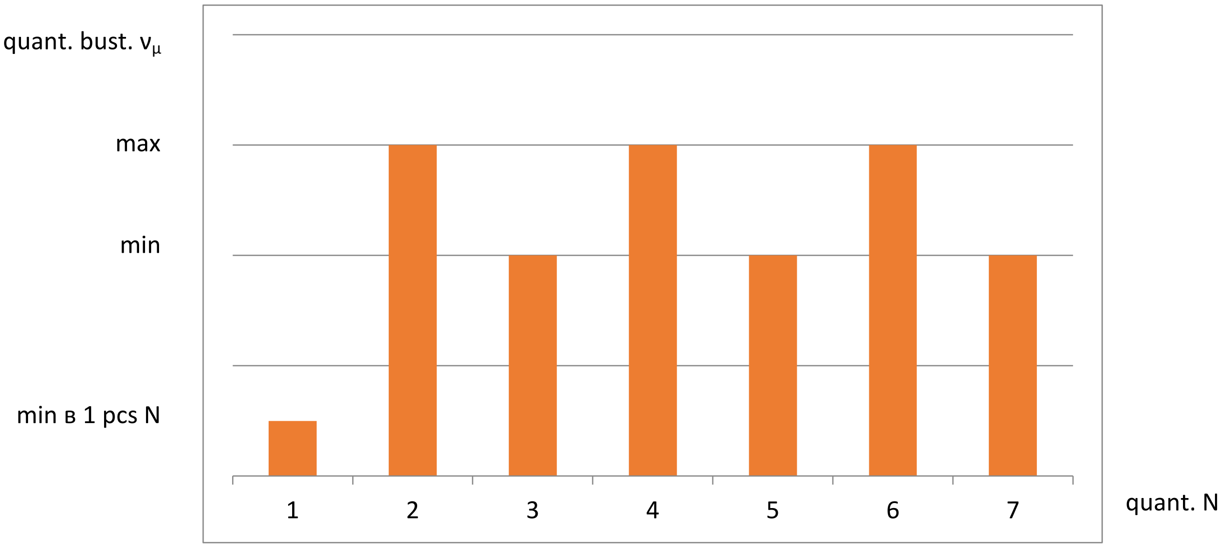


Fig. 7_26. Quantities of bursting mu-neutrinos in a homogeneous neutron chain

Let us pass to two neutrons.

The SIF forces attract the quark hoops of the two neutrons to each other, as a result, the neutrons are deformed and in the cross section become the four-leaf form, in the central part of which there will be two quark hoops at a short distance (a) from each other, see Fig. 7_27 (b). Bagels of tau neutrinos are significantly deformed (up to the corporal angle of 90 °), bagels of the mu-neutrino will be squeezed and a significant part of the mu-neutrinos will burst. To simplicity the bagels of the mu-neutrinos are not shown in the figure, and the section of the quark hoops is represented by bold dots.

In the graph of Fig. 7_26 this corresponds to the maximum of the bursting mu-neutrinos.

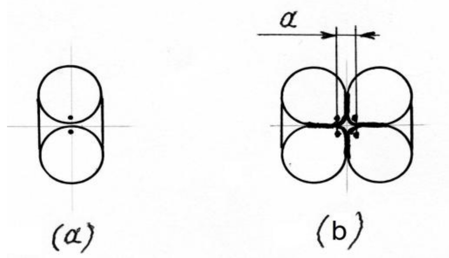


Fig. 7_27. A homogeneous chain of one and two neutrons

"We roll" the third neutron.

In the chapter on the form of nuclei, we "decided" that the nuclei grow in one direction. When considering the reactions of α-decay, we further will confirm this hypothesis. Therefore, we "roll" the third neutron from the side of the second neutron. Earlier, in the chapter on the shape of isotope nuclei, at the formation of the nucleus of the 3He isotope, we "subjected" all three nucleons of increased deformation, assembled them into one common group and "thrust" the "quark hoop" of the third nucleon inside of four-leaf form, to forming a six-sheet (with to the corporal angles 60^o), in which all three quark hoops were assembled in the center of the "flower" (see Fig. 5_6).

But now we know that "mites" were formed in the 3He isotope, in which two protons clamp together one neutron. As a result of the formation of "clamps ", an increased amount of mu-neutrino bursts, and as a result, all three nucleons are compressed together with increased force and the four-leaf form turns into a six-sheet.

In our case, when all three nucleons are "simple" neutrons, no "clamps " are formed, the mu-neutrino bursts much less, as a result, the force of attraction of the slit magnets of the second and third neutrons will be lowered. The attraction forces of the third neutron are not enough to further increase the deformation of the tau-shells of all three neutrons to 60o and "drag" the quark hoop of the third neutron into the middle of the four-leaf. The degree of deformation of the third neutron will be much less than the degree of deformation of the first and second neutrons, see Fig. 7_28 (a). No, it will not fall off, but will hang on the first couple of neutrons, on a thin flagellum of gluons. Accordingly, the number of bursting mu-neutrinos in it will be less then at the first two neutrons, which corresponds to a minimum of the "wave" (see Fig. 7_26).

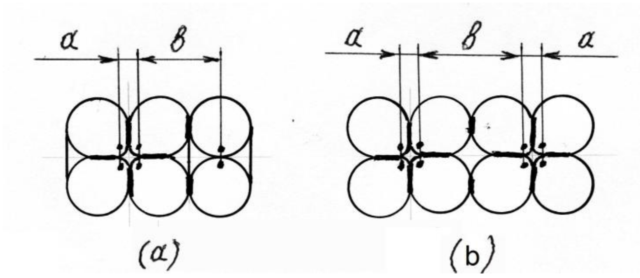


Fig. 7_28. A homogeneous chain of three and four neutrons

The fourth neutron flies.

The "mechanics" of its joining will be similar to the process of joining the first two neutrons, - the fourth and third neutrons will be strongly attracted to each other, forming the second four-leaf, see Fig. 7_28 (b). Their tau-shells in this case are deformed to 90 °, and the number of bursting mu neutrinos will again increase to the maximum (see Fig. 7_26). In this case, between the second and third neutrons, the connection will also increase slightly, since the number of "holes" in the slit magnets will increase, which will lead to an increase in the number (thickness) of the gluon flagellum. All four neutrons will represent a single unit consisting of two four-leafs.

The process of joining subsequent neutrons will be similar, resulting in the formation of a "sausage" of neutrons, consisting of a sequence of four-leafs (pairwise combined neutrons with an increased number of burst mu-neutrinos). This physical model explains why the maxima of the number of burst mu-neutrinos fall just on an even number of neutrons in the "sausage", and the minima for an odd number of neutrons in a "sausage" consisting of neutrons alone. As a result, we obtained a pronounced "wave" in the number of bursting mu-neutrinos.

Insertion of protons in a chain of neutrons

Why did the "insertion" of protons into a chain of neutrons not "break" the wave algorithm of the number of bursting mu-neutrinos? After all, with the advent of protons in the neutron chain, a powerful algorithm of "clamps " should come into operation. Let us examine this issue in more detail.

When inserting a proton into a chain of merging neutrons, two options are possible:

The first variant - the proton is built between two neutrons of one four-leaf; between odd and even neutrons;

The second variant - the proton is built between two four-leafs, i.e. between the even and odd neutrons.

It should be noted that the first variant corresponds to the formation of "standard" elements, and the second variant corresponds to the formation of "non-standard" (yellow) elements in our classification and isotope coloring in the isotope cloud. We remind you that for "standard" elements, the maximum number of bursting mu-neutrinos is the neutron following the proton (the second isotope of the element), while for "non-standard" elements the maximum number of bursting mu-neutrinos is the second neutron (the third isotope of the element).

In both cases, we have formed classic "mites". But the results of their influence on the wave process of mu-neutrino bursting in comparison with the wave process in a homogeneous neutron chain are different (see Figures 7_29 and 7_30). In both figures the proton is shaded, for clarity.

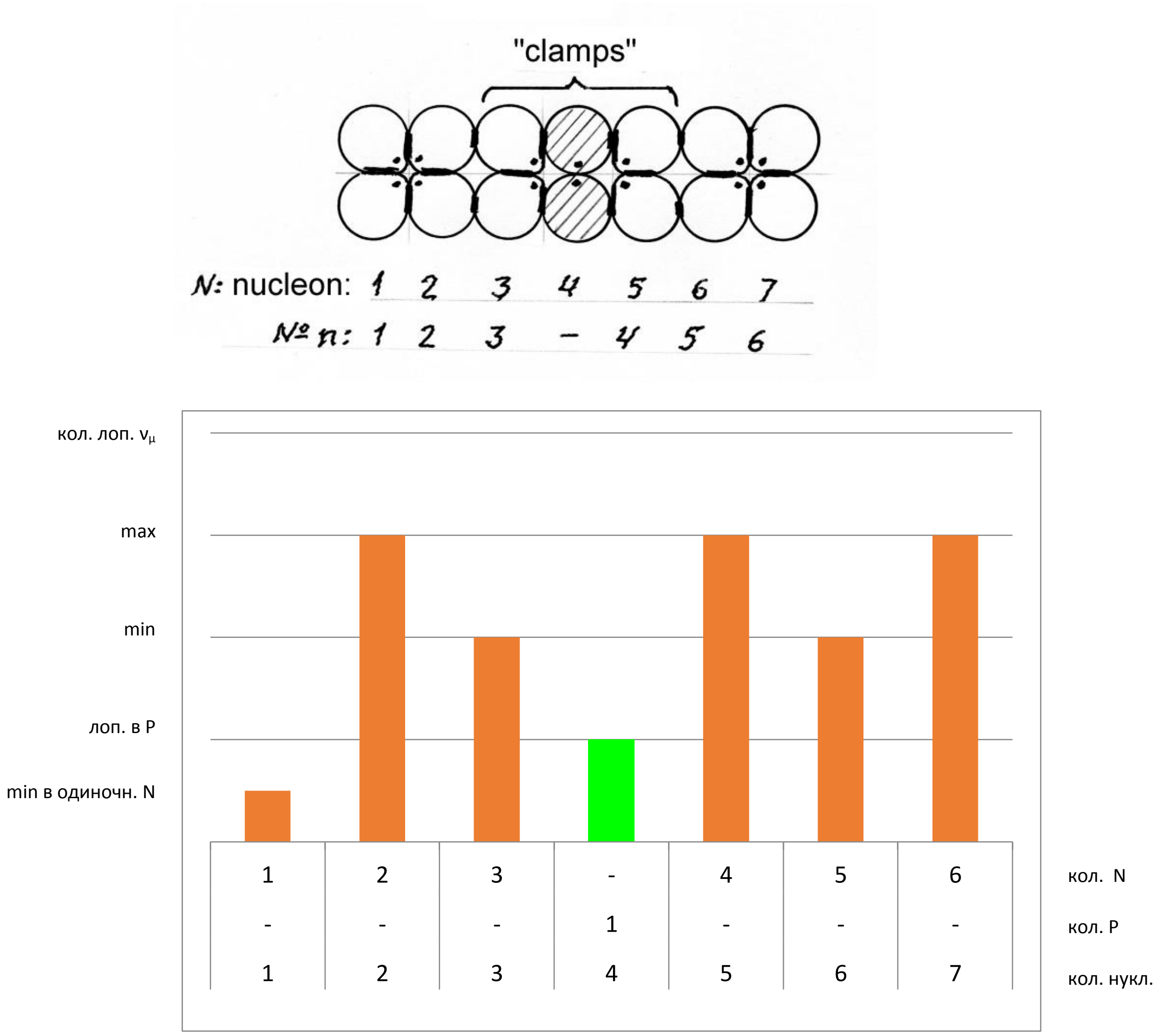
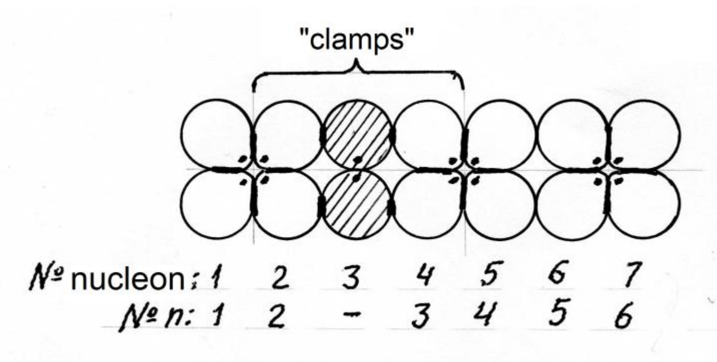


Fig. 7_29. Insertion of a proton into a homogeneous neutron chain (second variant)



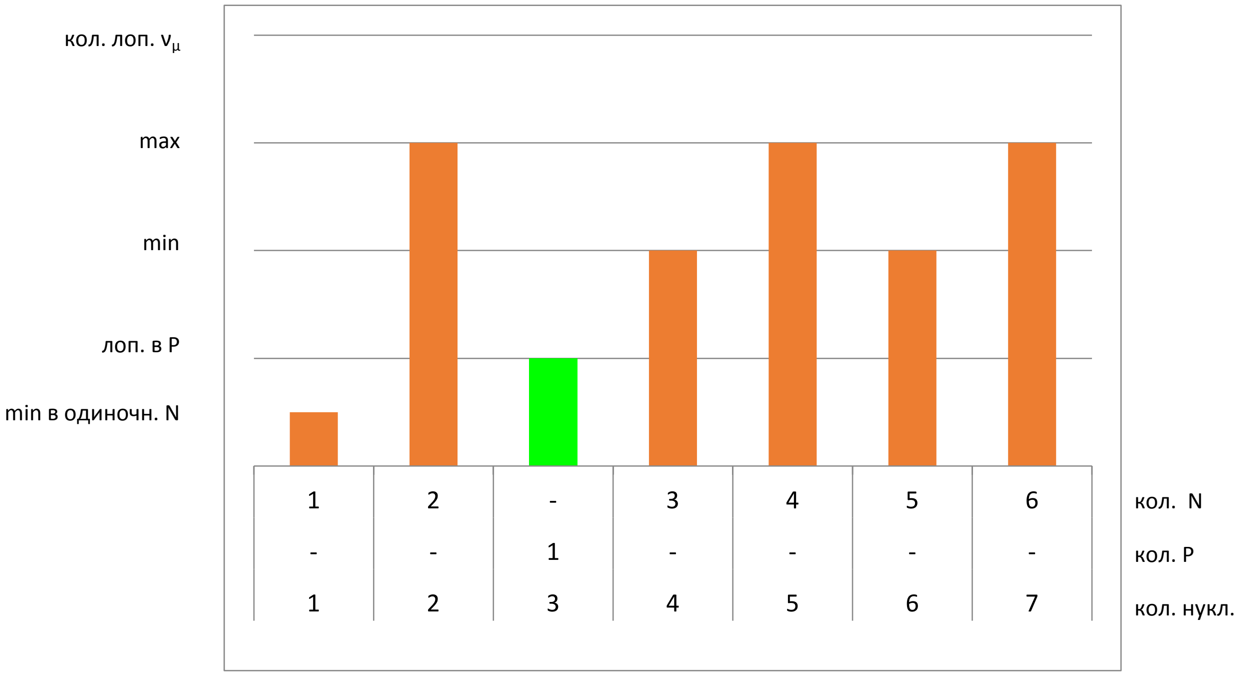


Fig. 7_30. Insertion of a proton into a homogeneous neutron chain (first version)

In both the first and second versions, the appearance of a proton leads to a sharp decrease in the number of bursting mu-neutrinos due to the multidirectional work of one pair of slit magnets. Only in the first variant, the reduction occurs from the minimum level of the undulating process, and in the second case from the maximum level of the undulating process.

With the addition of a neutron following the proton, "clamps " are formed, as a result the number of bursting mu-neutrinos increases sharply. Only in the first case to the maximum level of "wave", because odd and even neutrons, between which the proton has located, are maximally connected with each other and will compress the proton with the "doubled" force (maximum wave + "clamps "). And from the next neutron a new "couple" of neutrons (four-leaf) will begin to be built, and at this stage the number of bursting mu-neutrinos will decrease to the lower boundary of the "wave". With the addition of the next second neutron of second four-leaf, the number of bursting mu-neutrinos will increase to the upper limit of the "wave", etc. (see Figure 7_29).

In the second variant, the formation of "clamps " will also cause a significant increase in the number of bursting mu-neutrinos. Only the neutrons that clamped the proton to each other belong to different "pairs" of neutrons (four-leafs). Their "quark hoops" are drawn to the centers of four-leafs, as a result, the distance between them is increased. Both four-leafs will "resist" "pulling" their quark hoops towards the proton, although an additional bond between the neutrons ("clamps ") still forms. Therefore, the compression force of the "clamps " will be less than in the first version. As a result, the number of burst mu-neutrinos will jump, but only to the lower boundary of the "wave." With the addition of the next neutron, the new four-leaf will "close" and the number of bursting mu-neutrinos will additionally increase to the maximum level of the "wave" (see Figure 7_30).

As we see, the appearance of a proton in a chain of neutrons in both variants leads to a sharp decrease in the number of bursting mu-neutrinos, and on the next neutron the wave-like process is restored. This leads to a rupture and shift of the wave-like function of the number of bursting mu-neutrinos by one position, if one counts on the scale of the number of nucleons. If, on the same scale, only neutron counts are taken into account, then the local maxima of a given function still correspond to even numbers of neutrons, and minima to odd neutron numbers.

In our model of the formation of a "wave" in a chain of neutrons and the conservation of a "wave" when protons are "inserted" into a given chain of neutrons, there is one global consequence that the resulting wave process will propagate not only to nucleon chains identical to the isotope nuclei, (one horizontal row of isotopes in an isotope cloud), but also to global nucleon chains, identical isotope sequences from the beginning of the isotope cloud to its end. We called this effect a "global wave". In this case, the rule for the "global wave" is the maximum number of bursting mu-neutrinos in isotopes with an even number of neutrons, and the minimum number of bursting mu-neutrinos in isotopes with an odd number of neutrons. This consequence leads to an alternation in the isotope cloud of vertical rows corresponding to the minimum and maximum number of bursting mu-neutrinos (ranks with odd and even number of neutrons).

This rule is not violated even in the case of "embedding" in the chain of neutrons not one but several (up to four) protons in a row. They "simply" connect with each other co-axially and "are considered" embracing them neutrons, as one "big" proton.

Special attention should be paid to situations in which protons and neutrons alternate one after another (or two) of the same type of nucleon, resulting in double, triple, and so on. "clamps ". Without conducting a detailed analysis of these options, we note that the law of the formation of the "global wave" is still preserved in this case.

"Mountains ", "ravines" and "deflection" of "ladders"

The compression force that occurs when another relic neutron is added extends to all the nucleon bonds in the isotope, affordable the standing gluon wave (SGW) (flagella of gluons) i.e. when a relic neutron is added, the mu-neutrinos can burst in all nucleons of the nucleus. A bright confirmation of this "mechanism" is the 56Fe isotope. When it was formed, all the "extra" mu-neutrinos burst in all preceding nucleons, and in each nucleon there were only 9 mu neutrinos left.

Therefore, with an increase in the length of the nucleon chain of the isotope, the additional compression force that arises when the next nucleon joins (and it have a certain finite value) is divided into an ever increasing number of bonds between nucleons. As a result, the specific compression force of the two nucleons added to one bond decreases and, as a consequence, the number of bursting mu-neutrinos decreases in this connection.

In addition, when nucleons are compressed, with the mu-neutrinos that have previously burst in them, the mu-neutrinos that remain in them have the opportunity to unfold in their landing place (the disappearance of neighboring mu-neutrinos allows them to do so). As a result, some of the compression force goes to the mu-neutrino rotation, which also reduces the number of bursting mu-neutrinos. All this leads to an additional drop in the specific number of bursting mu-neutrinos per bond.

This decrease in the number of bursting mu-neutrinos ("mountains ") locally manifests itself in the descending slope of the lobes of the bursting mu-neutrinos in the horizontal rows of isotopes of one element (Fig. 7_31) and globally in a gradual decrease in the maxima of the bursting mu-neutrinos (belonging to the isotope groups of one element) along the axes OZ and ON (see Figure 7_32, 7_33).

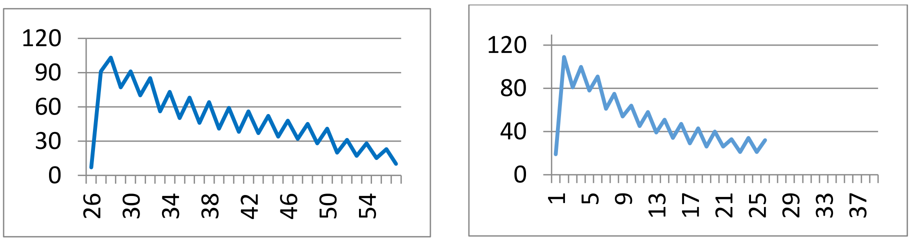


Fig. 7_31. Typical "mountains " in the ranks of isotopes of one element

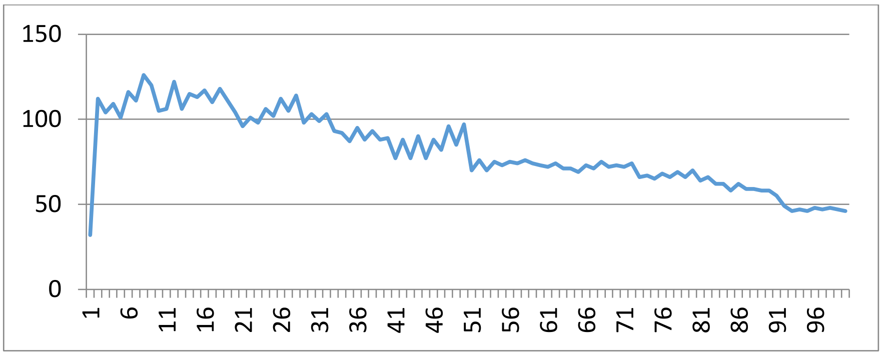


Fig. 7_32. The "mountain " of the maxima along the OZ axis

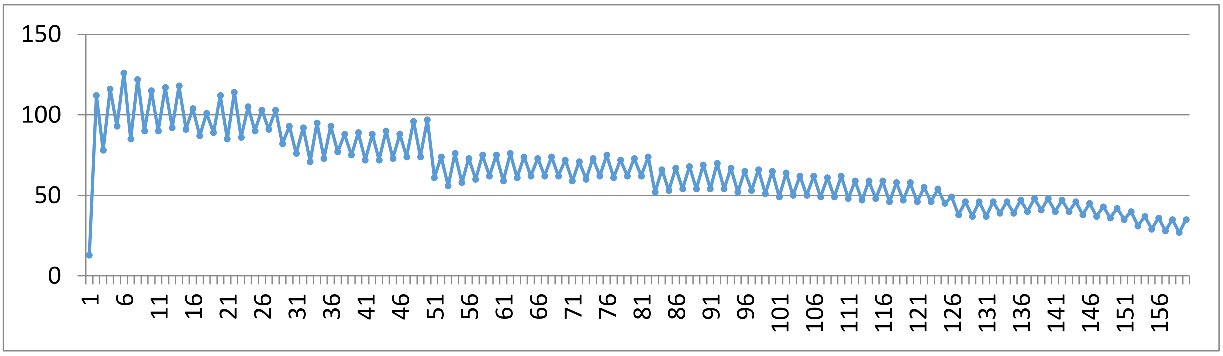


Fig. 7_33. "Mountain" of maxima along the axis ON

The last graph shows three steps down by increased size. They cross all isotopes of the cloud and correspond to an odd number of neutrons in isotopes equal to 51, 83 and 127 pieces. This is clearly seen in the three-dimensional graph, see Fig. 7_5. We called these steps - "ravines".

On the local "ladder" elements, the "gullies" look similarly, gradually moving to the beginning of the "ladders" as the number of protons in the element increases (see Figure 7_34).

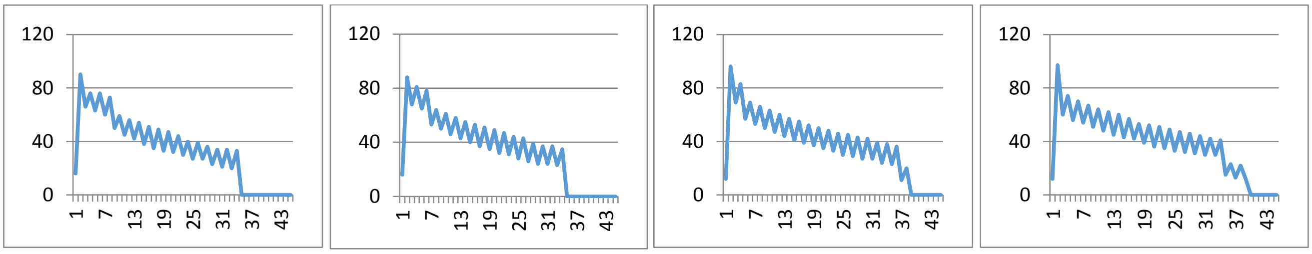
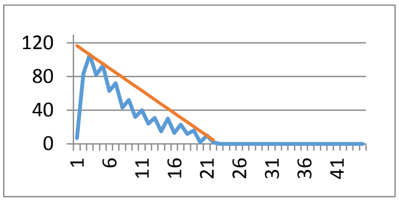


Fig. 7_34 "Gullies" on the "ladders" of the elements Ru, Pd, Cd, Sn

The lengths of the "ladders" of some elements are sufficient to capture two "ravines", as, for example, "ladder" of elements of Cd and Sn.

The obvious reason (physics) for the appearance of "ravines" was not revealed by us. The simplest version of the explanation of the "ravines" was a certain number of intervals between them, which could be connected with the resonances of the standing gluon wave (SGW) , but there is no such multiplicity. True, given the disparity of the distances between neighboring nucleons of nuclei, it is possible that the total distances between the "ravines" are still equal to each other. The question of constructing a physical model of "ravines" requires additional study.

And, at last, one more additional regularity, revealed by us during the analysis of "ladders", is their "deflection". Here are some examples of "deflections", see Fig. 7_35.



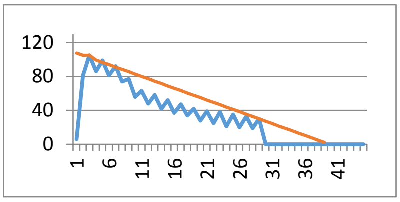


Fig. 7_35. "Deflection" on "ladders" of elements of Al and Co

The physical nature of the origin of the "deflections" of the "ladders" is also not revealed by us, it is obviously connected with the physics of the algorithm for the appearance of "mountains " and requires additional research. We can only state that the "deflections" of the "forester" are, and they must also be taken into account in the mathematical model of the "T-CODE".

The order of building a theoretical "key" (T-CODE)

We want to make a reservation at once, throughout the whole chapter we have actively used the terms "experimental key" and "theoretical key". These terms are relatively short and sufficiently shapedto reflect the essence of the problem - to find an algorithm (CODE), under the "control" of which the process of nr_ nucleosynthesis of the isotope spectrum proceeded.

So far, we have "worked" with the experimental "key" (E-CODE), we examined and analyzed it in a tabular form and graphs to identify the physical laws of the process of nr_nucleosynthesis.

Now we turn to the theoretical "key" (T-CODE) and we need to clarify that under the theoretical "key" we mean the compilation of a mathematical model that allows us to calculate the number of bursting mu-neutrinos at each step of nr_nucleosynthesis of an isotope cloud. For brevity, we will continue to use the term "theoretical key", but, in fact, we will "build" this mathematical model of the process of nr_ nucleosynthesis of the isotope cloud.

What are the options for constructing a theoretical "key"?

The first variant: To construct separate mathematical models (formulas) of the revealed regularities ("clamps ", "waves", "ladders", "ravines") on the basis of their physical models, and then combine them into a single mathematical model (single formula) for calculation of the number of bursting mu-neutrinos. This option requires the construction of a mathematical model of the "work" of the SGW and for us is "not lifting." We will go the other way.

The second option: To select the functions of describing the individual regularities identified by the approximation method and integrate them into a single function (formula). This option allows us to take into account the influence of even those laws whose physical models we could not build (for example, "ravines").

The general strategy for constructing a theoretical "key" will be as follows:

We need to select five functions of the parameters Z and N (the number of protons and neutrons in the isotope), adequately reflecting:

A) The number of bursting mu-neutrinos from nr-nucleosynthesis of isotopes-proton, P = f1 (Z).

B) The maximum number of bursting mu-neutrinos for nr-nucleosynthesis of the first (for "standard" elements) or the second (for "nonstandard" elements) isotopes-neutrons for each isotope group of one element, M = f2 (Z).

B) The maximum length of the "ladders" for each isotope group of one element, Lo = f3 (Z) is the physical number of the nucleon in the isotope group of one element, where "ladder" is lowered to zero. The parameters Loi and Mi will specify the "slope ladder" ("mountains ") for the i-th element of the isotope cloud (Zi).

D) Amplitude of the wave process ("wave") of mu-neutrino bursting at each step of the "ladder" (the size of the stairs "ladder"). Given the slope ("slides"), each "ladder" should have two amplitudes - the step down (h1) and the step up (h2), with h1> h2. Knowing the parameters h1, M and Lo for the i-th element, we can calculate the parameter h2. Therefore, in order to construct a theoretical "key", it is sufficient for us to know only one function, h1 = f4 (Z).

E) Finally, the fifth function is a general algorithm for calculating the number of bursting mu-neutrinos in the "ladder with a leg" for each element, X (Zi) = f5 (P(Zi), M(Zi), Lo(Zi), h1(Zi), h2(Zi), A*). The parameter A* in this formula is taken from the transformed cloud - this is the ordinal number of the isotope in the horizontal group of isotopes belonging to one element. The index "*" means its difference from the parameter A, which is used to denote the number of nucleons in the isotope. Between them there is a link A = Ap + A*, where Ap is the number of nucleons in the isotope-parent from which the first isotope-proton of the group was formed.

The parameter A* is also related to the parameter n*, which determines the number of neutrons in the isotope, minus the neutrons in the isotope-parent , "taken out of the bracket" at the formation of the transformed cloud. Between n* and A* there is a relation n* = A* -1. In fact, n* is the number of additional neutrons in the horizontal row of isotopes of one element (0, 1, 2, 3, etc.).

The set of these functions in aggregate will constitute a theoretical "key". We will search for these functions by the method of approximation of the required curves corresponding to these functions in the experimental "key". In doing so, we will perform several iterations of approximation, gradually approaching the final result, which will enable us to estimate the degree of influence of each parameter on the final result.

The first variant of the theoretical "key" (approximation by constants)

The initial graphs of the parameters P and M of the experimental "key" are shown in Fig. 7_20.

For the first iteration of constructing a theoretical "key", we select the simplest approximation of these parameters in the form of constants close to the mean values of these parameters: P = 10 and M = 60 (see Figure 7_36).

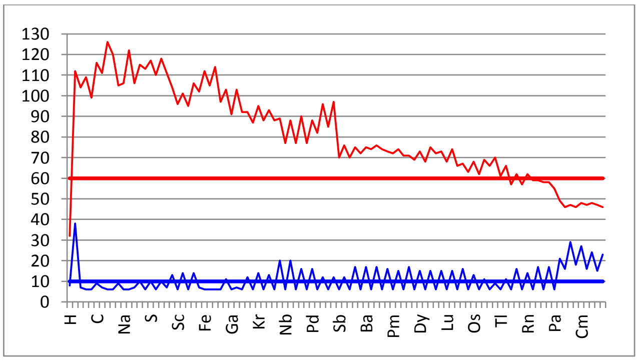


Fig. 7_36. Approximation of the functions P and M by the constants P = 10 and M = 60

The situation with the selection of a constant for approximation of the function Lo = f3 (Z) is a bit more complicated, the fact is that on the histograms and graphs of the experimental "key" given by the given function (curve) does not exist. Most experimental "ladders", calculated from reference isotope masses, end in "abyss", not reaching the zero level (see Figure 7_18). It is difficult to formalize such "staircases", terminating at arbitrary length and height.

To construct a theoretical "key" we need a line Lo, consisting of points in which all "ladders" reaches zero level. Therefore, before we attempt to approximate the function Lo = f3 (Z), we first had to extrapolate all experimental "ladders" to zero level. Taking into account the wavy form of the "ladders", we extrapolated them according to the highest value at the beginning of the "ladder" and the last maximum at the end of the "ladder". Having omitted the calculations of this extrapolation, we give the graph of Lo for the experimental "key" (see Fig. 7_37).

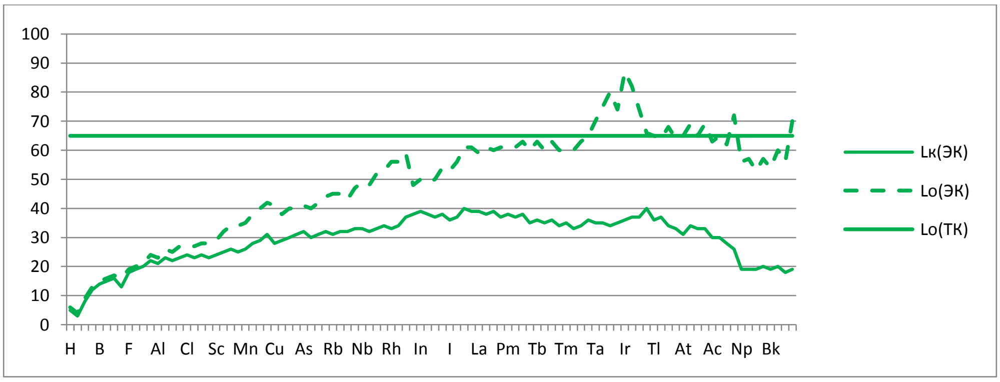


Fig. 7_37. Extrapolation of the Lo function for the experimental "key" and the choice of the approximating constant Lo = 65

On the graph above, the continuous thin line Lk (EC) denotes the maximum (finite) number of isotopes in the horizontal isotope groups of each element. In fact, this is a bypass of the filled cells in a transformed cloud of isotopes. But in most of the last (finite) isotopes of each element, the number of mu-neutrinos that burst is much larger than zero. Extrapolation of the experimental "ladders" taking into account their maximum and minimum values, as well as the length Lk (EC), makes it possible to calculate the length of the "ladders" Lo (EC) for each element, at which the "ladder" will reach zero level (zero number of bursting mu neutrinos) . The lengths of the "ladders" are indicated on the graph with a dashed line.

The dashed line for each element (Z) will correspond to the isotope number of this element, in which the number of bursting mu-neutrinos is zero. Purely "theoretically" these points will limit the maximum possible number of isotopes in a given element. This does not mean that all the additional isotopes enclosed between the lines Lk (EC) and Lo (EC) should exist "in fact," we will never find many of them experimentally, but under some extreme conditions (in the past) they nevertheless were formed.

As an approximation to the Lo (EC) line, we choose Lo (TC) = 65, giving priority to longer "ladders".

Note to Lo (EC):

The calculated curve Lo (EC) = f (Z) refers to the transformed isotope cloud and shows the maximum possible number of nucleons in the isotope group of one element. If we add to the resulting Lo (EC) curve the neutrons taken out beyond the bracket during the transformation of the isotope cloud and take away the unit (the proton that gave rise to the given element), we obtain a theoretical limit line of the isotope cloud along the neutron axis from above (in the generally accepted coordinate system of the cloud). Theoretical limitation of the isotope cloud along the neutron axis from below is the first isotopes in each isotope group of one element, which were formed by the transformation of a relic neutron into a proton (see Fig. 7_38).

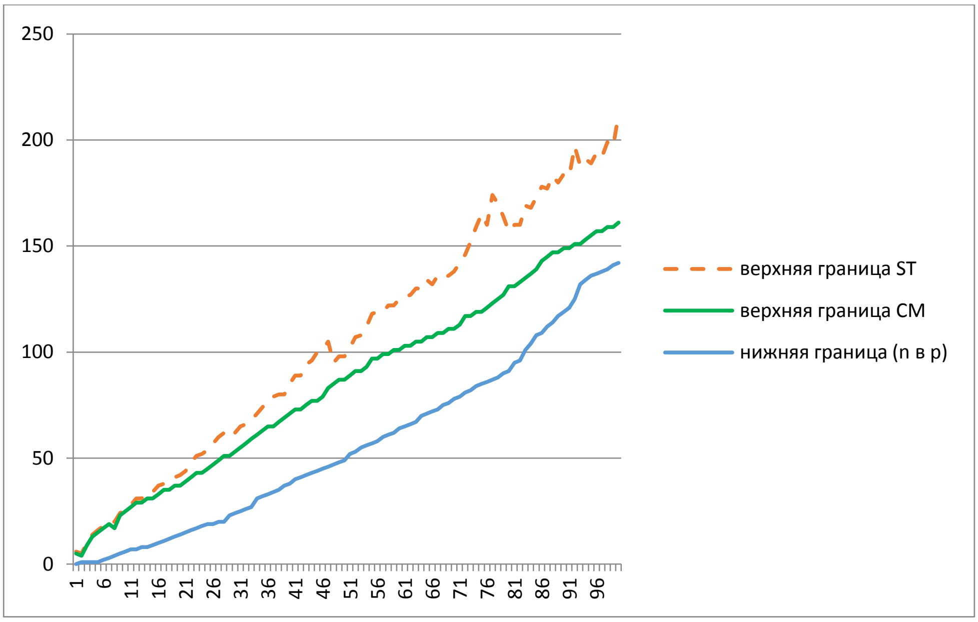


Fig. 7_38. Theoretical boundaries of the isotope cloud according to S_theory

The upper boundary of the isotope cloud according to S_theory turned out to be with some "peaks" and "troughs". This indicates a certain potential for refining the Lo (EC) calculations or the initial data (reference isotope masses of some isotopes).

We continue the construction of the theoretical "key" (the first iteration).

For the first iteration, we take straight sloping lines as an approximation of the "ladder". For simplicity, all elements will be conventionally considered standard.

The parameter h1 can then be calculated for each element (Z) by the formula

h1 = M / (Lo-Lm)

Parameter h2 is dependent and for this variant is equal to (-h1) - ladder at each step is omitted by the value of h1.

The formula for calculating the number of bursting mu neutrinos for each isotope of the element then takes the form:

X = 60-h1*(A* - 2), where

A* is the sequence number of the isotope in the isotope group of this element

In Fig. 7_39 shows the resulting three-dimensional graph of the first version of the theoretical "key" for the transformed cloud.

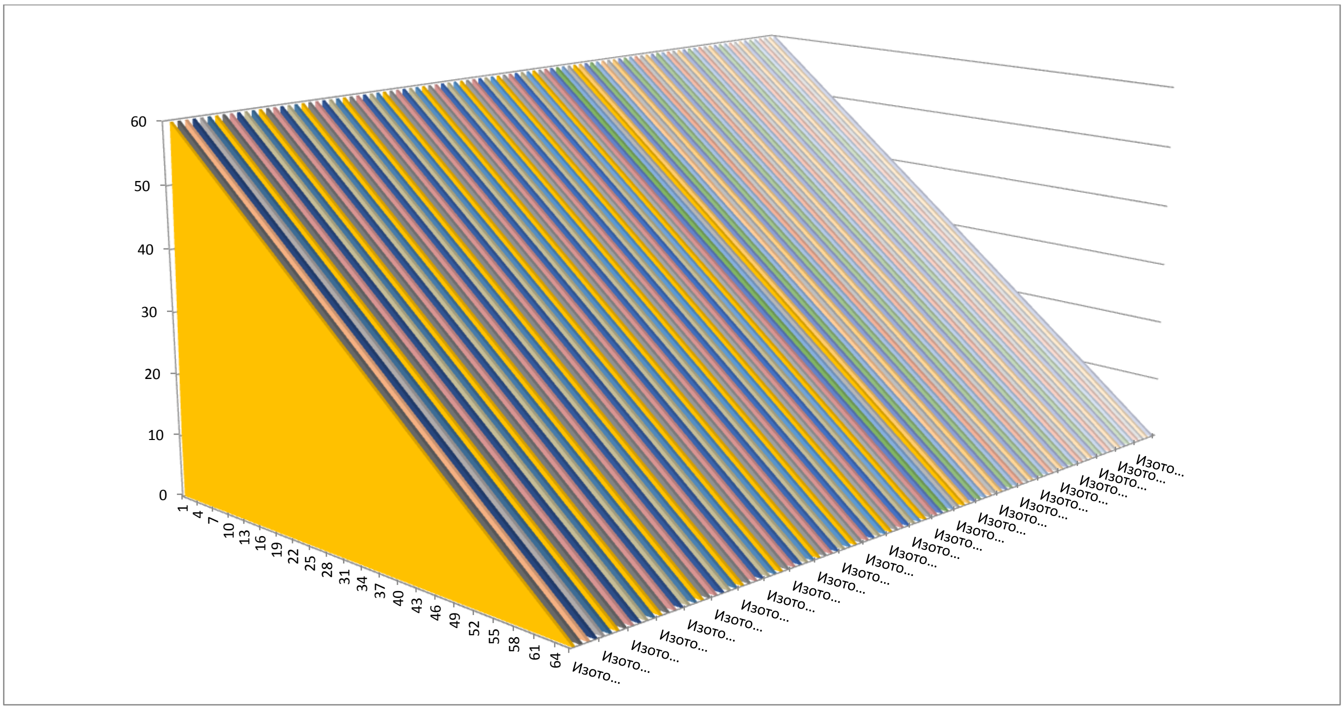


Fig. 7_39. The first variant of "preparation" of the theoretical "key"

The resulting theoretical "key" at best can be called "key billet." But let's check how will be went nr_nucleosynthesis in main-stream under the "control" of such a "key". To check from the calculated data of the first variant of the theoretical "key", we selected data relating to the isotopes lying on the main-stream. We recalculated these data into the number of mu-neutrino bursts per one nucleon of the isotope and compared the result with a similar graph for the experimental "key" (the bond energy graph), see Fig. 7_40.

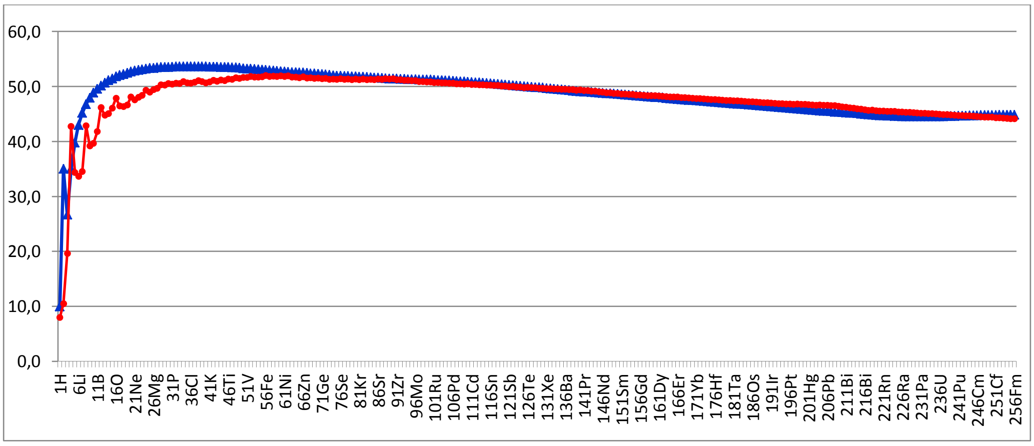


Fig. 7_40. The graph of the number of bursting mu-neutrinos in main-stream for the first version of the theoretical "key" (blue line) and the graph of the Communication Energy (red line)

As we see, even such a simplified approximation, which we applied in the first iteration of constructing the theoretical "key" (TC), gives similar graphs of the burst mu-neutrinos and the binding energies in the main-stream isotope series. It turned out even one characteristic step at the beginning of the graph, characteristic of the reactions of thermonuclear fusion. This testifies to the correctness of our approach in constructing the theoretical "key".

Correct, but still very far from the experimental "key" (EC), as further evidenced by the calculation of the "rook" for the first iteration of the TC (see Figure 7_41).

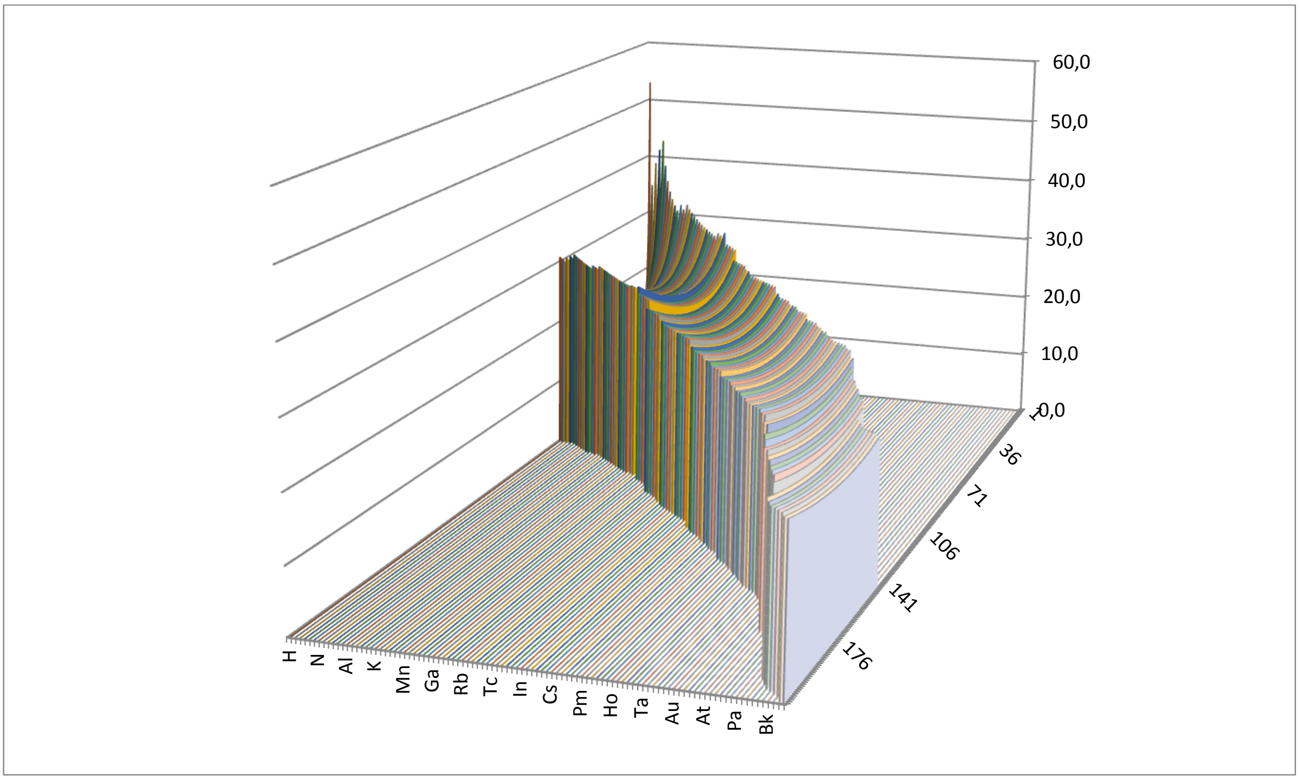


Fig. 7_41. "Rook" for the first iteration of the theoretical "key"

As we can see, the initial part of the "rook " corresponding to the beginning of the cloud of isotopes is especially different.

An even more striking difference between the theoretical "rook " and the experimental one is observed if we plot the graphs of their sections that represent the minimum points in each row of isotopes of one element, see Fig. 7_42.

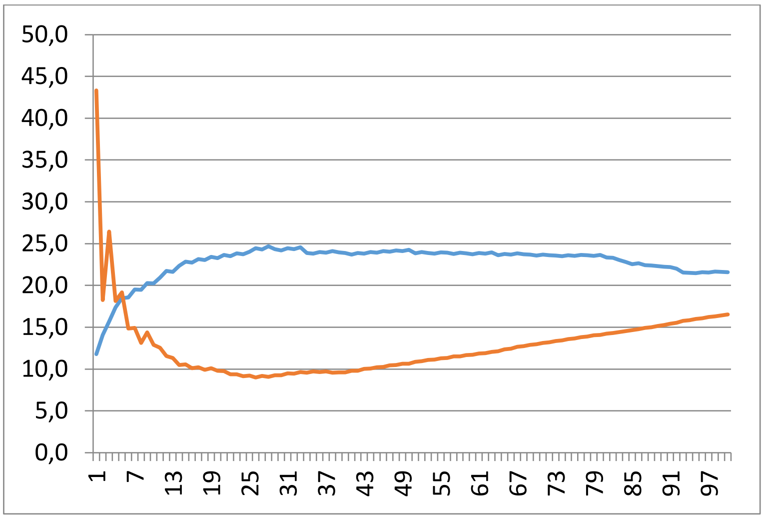


Fig. 7_42. Graphs of sections "T-rook" (blue) and "E-rook" (red)

As we see, they are more likely to be mutually opposite than similar ones.

We will try to correct these shortcomings in the second iteration of developing a mathematical model of the theoretical "key".

The second version of the theoretical "key" (finish)

We promised the readers to give a detailed "picture" of the construction of the "T-key" (T-CODE) with the display of the effect on the result of the individual elements. In fact, we had to sort out so many options and highlya detailed coverage of them would lead to excessive confusion. Therefore, we confine ourselves to two variants of the "T-key" - the first variant of the "T-key" ("billet") and the final version of the "T-key".

The final version of the "T-key" differs significantly from the billet.

Firstly, in the final version we "tied" the four starting points of our "T-key" to the corresponding points of the "E-key". In the table view it looks like this:

Z(p)	1	2	3	-->	100
P(TK)	8	38	10	--->	10
M(TK)	32	112	-->	--->	50

In a graphical form, it looks like this (see Figure 7_43):

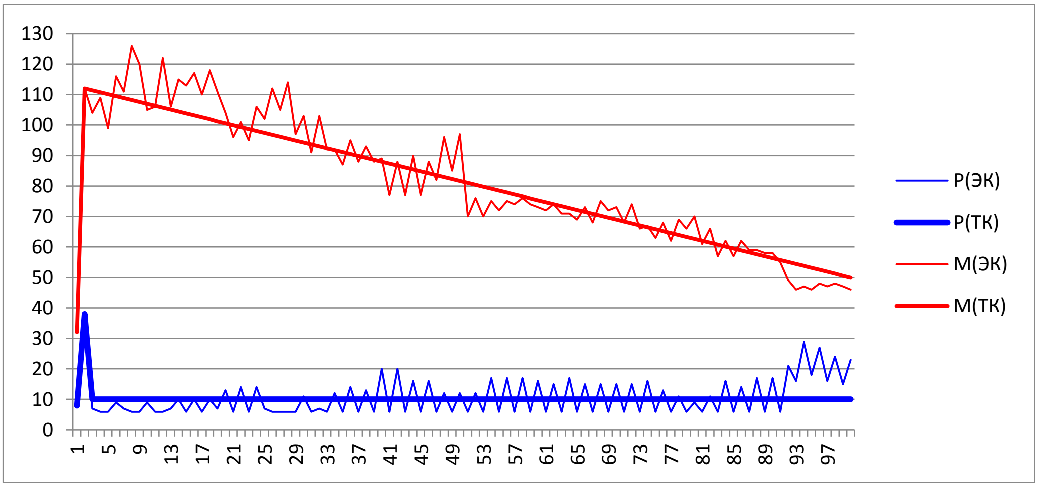


Fig. 7_43. The final variant of the approximation of the functions P (TK), Max (TK)

The choice of the first point of the function P1 (TK) = 8 does not cause any questions, it is the number of mu-neutrinos that burst when the relic neutron decays and the formation of a standard proton, the nucleus of the 1H isotope. In fact, this is one of the basic parameters of the S_theory, which follows from the reference masses of the proton and the relic neutron.

The second point P2 (TK) = 38, the first point M1 (TK) = 32 and the second point M2 (TK) = 112, we took from the experimental "key" in order to properly "to tie" to the required graphs. These points uniquely determine the number of bursting mu-neutrinos in the first four "key" isotopes (1H, 2H, 3He, 4He) and fundamentally affect the initial section of the theoretical "key" and the resulting "rook ".

The subsequent points of the approximating function P(TK) were left unchanged equal to 10. The subsequent points of the approximating function M(TK) decrease linearly to a value of 50.

In the graph of the approximating function Lo(TK), we introduced a break exactly in the middle of the graph, tilting the first point to a value of 8, and lowering the level of the second half of the graph to 60, approximating the plot of the approximating function Lo (TK) to the graph of the original function Lo(EK), see Table. and Fig. 7_44.

Z(p)	1	-->	50	-->	100
Lo(TK)	8	-->	60	--->	60

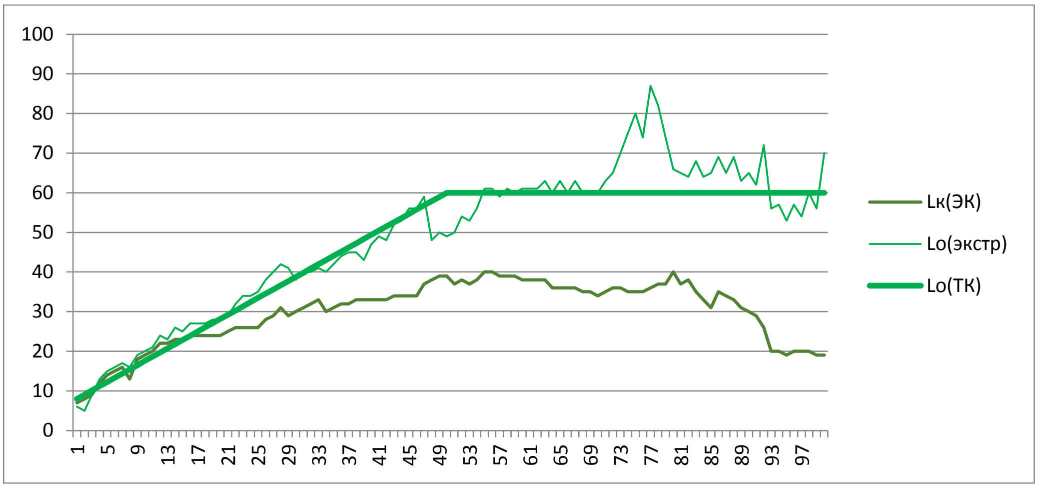


Fig. 7_44. The final version of the approximation of the functions Lo (TK)

And, of course, in the final version of the "T-key" we introduced "into operation" three additional patterns:

1. "inclined wave" ("inclined ladder" - "mountains ")
2. "ravines"
3. "deflection of the ladder"

An additional complication is that the algorithm for constructing a particular "ladder" of an element is determined with the participation of all three specified regularities.

We divide the general algorithm for constructing "undulating inclined ladders" with "ravines" and "deflections" into three algorithms:

1. The first algorithm is a uniformly inclined "wave" ("mountains ");
2. The second algorithm is "ravines";
3. The third algorithm is "deflections".

Unfortunately, we can not offer physical models of the occurrence of these regularities. It seems that this requires only additional time for additional S_analysis and modeling of these regularities based on S_models of nucleons and the processes of their conjugation.

While this has not been done, we will replace the construction of S_models of the indicated regularities by constructing mathematical models (algorithms) for calculating these regularities with the objective function of maximum approximation of experimental "ladders" of isotope groups of one element.

<u>Algorithm for calculating an inclined "wave" ("mountains ")</u>

In Fig. 7_45 graphically depicts the mathematical model of the algorithm for calculating an inclined "wave" ("mountains ") for each row of isotopes of one element. The slope of the "wave" is assumed to be uniform, the width of the "channel" of the "wave" is assumed constant.

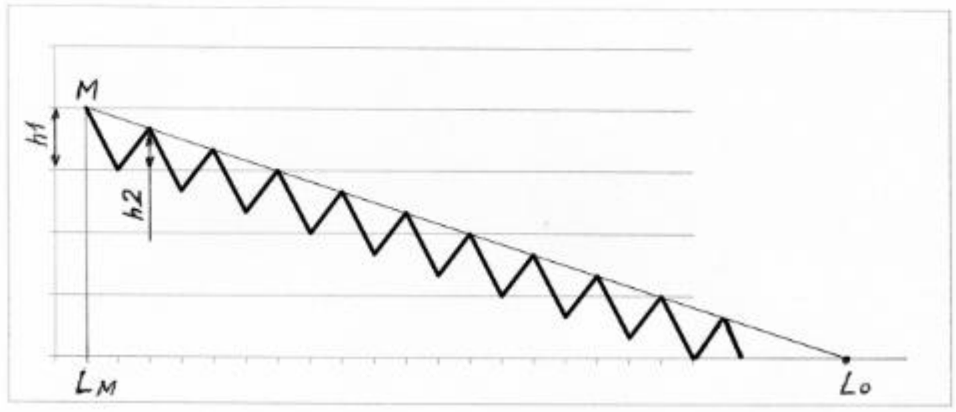


Fig. 7_45. Model (algorithm) for calculating an inclined "wave" ("mountains ")

The base points of the "wave" are determined by the previously determined parameters M, Lm, Lo for each isotope group (element, Z).

The width of the "channel" can be set in different ways, we chose the way to set it using the "wave" step down (parameter h1).

For the final version of the "T-key" parameter h1 is set, similarly to the parameters P, M, Lo, using the approximating function of the first steps down after the maxima calculated for the experimental "ladders" of each element. In Fig. 7_46 and the attached table gives the result of this approximation.

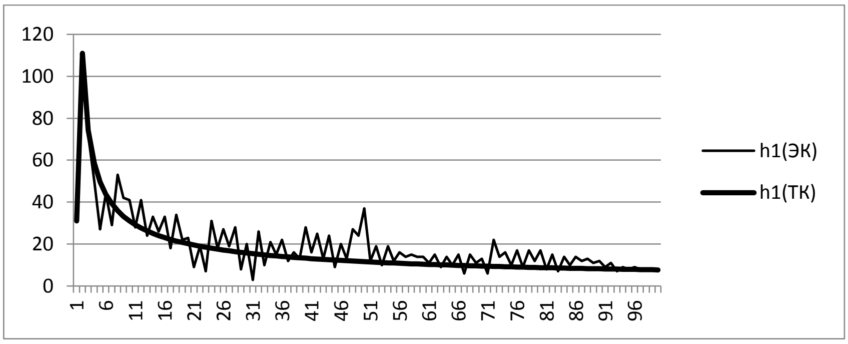


Fig. 7_46. The final version of the approximation of the functions h1 (TK)

In the table-algebraic form, the parameter h1 (TK) can be defined as follows:

Z(p)	1	2	3	4	…	100
h1(ТК)	31	$111*(Z_i - 1)^{-0,58}$				

As a result, we received a complete set of parameters for calculating all points of the inclined "wave". The value of the "wave" point following the maximum (Xi = M) is a local minimum and will be equal to: X_{i+1} = M-h1. The value of the next wave point (X_{i+2}) is the local maximum and will be equal to: $X_{i+2} = X_i * (Lo - A^*_{i+2}) / (Lo - A^*_i)$. The argument A* in this formula can be replaced by the argument n* (the neutron number in the isotope group of one element).

From the parameters obtained, we can calculate the reference parameter h2, it will be equal to: h2 = h1 - 2M / (Lo - Lm). We need this parameter to calculate the parameter X in the second graph of the transformed cloud for nonstandard elements: Xrp2 (HST) = M - h2.

Algorithm for calculating "ravines"

We remind you that "ravines" cross the entire cloud of isotopes in rows with the value of the number of neutrons equal to 51, 83, 127 pcs.

In Fig. 7_47 graphically depicts the mathematical model of the algorithm for calculating "ravines".

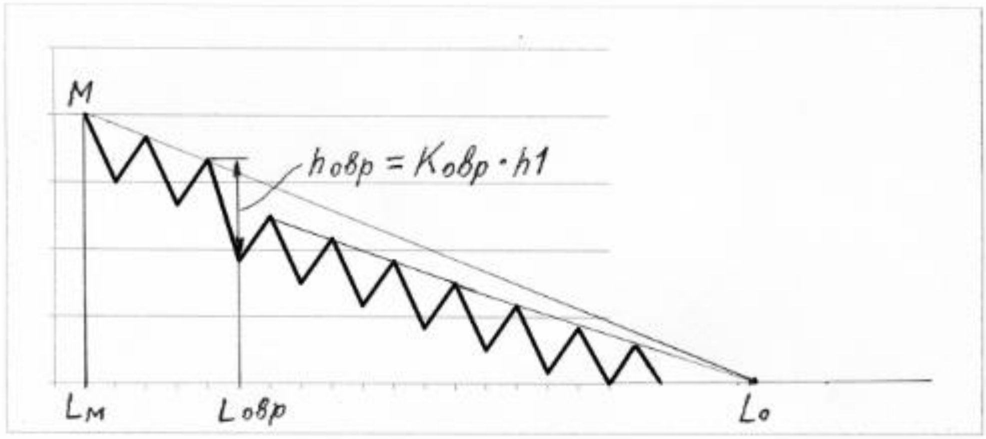


Fig. 7_47. The model (algorithm) for calculating the "ravine"

The depth of the step "ladder" in the "ravine", we will specify the coefficient Krav = h1rav / h1. Then the lower point of the "wave" after the "ravine" is equal to $X_{i+1} = X_i$ - Krav * h1.

The final "target" of the new "channel" will remain the same - Lo.

The first high point of the new "channel" (X_{i+2}) will be equal to:

X_{i+2} = (Lo - A^*_{i+2}) / (Lo - A^*_i) - Δ = (Lo - A^*_i + 2) / (Lo - A^*_i) - h1 * (Krav-1)

Calculation of subsequent points in the new "channel" follows the algorithm for calculating the inclined "wave". The value of the Coefficient in the finish version is assumed to be 1.8.

Algorithm for calculating "deflections"

In Fig. 7_48 graphically depicts the mathematical model of the algorithm for calculating the "deflections of the ladders".

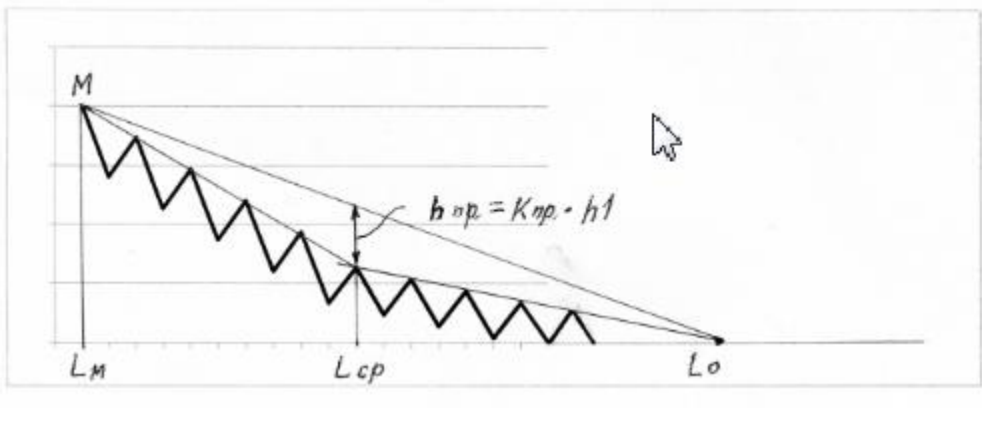


Fig. 7_48. The model (algorithm) for calculating the "deflection"

The "deflection" value will be given by the "deflection arrow" (Δh_{def}) in the middle of the ladder with the coordinates L_{mid} = (Lo-Lm) / 2 and X_{mid} = M / 2.

The "deflection arrow" will be given by the deflection coefficient $K_{def} = \Delta h_{def} / h1$.

The upper boundary of the original "canal" of the "ladder" will descend in its middle part to the point:

$X^*_{mid} = X_{mid} - \Delta h_{def} = M / 2 - K_{def} * h1$

As a result, the initial "channel" of the "ladder" turns into two "channels": one to the middle of the "ladder", the second after the middle of the "ladder".

At the "channel" in the first half of the "ladder" will change the "goal" (at Lo*), it will be equal to:

$Lo^* = (M * L_{mid} - X^*_{mid} * Lm) / (M - X^*_{mid})$

At the "channel" in the second half of the "ladder" the "goal" is saved (Lo).

After determining the "goals" of the first and second "channels", the calculation of the "wave" points in them is carried out according to the algorithm for calculating the oblique "wave".

The value of the coefficient K_{def} in the finish version is taken equal to 0.5.

Generalized algorithm for calculating the "T-key"

After determining the values and formulas for calculating all parameters, we will compile a generalized algorithm (formula) of the "T-key" for calculating the number of bursting mu-neutrinos for nr_nucleosynthesis of all cloud isotopes (in a transformed form).

For clarity of representation and perception of the "T-key" formula, let's bring it in table-algebraic form:

the first graph of isotopes-proton (A * = 1 or n * = 0, all elements)	$X_1 = P$
the second graph of rank isotope (A* = 2 or n* = 1, standard elements)	$X_2 = M$
the second graph of rank isotope (A* = 1 or n* = 1, non-standard elements)	$X = M - h_2$
the third graph of rank isotope (A* = 3 or n* = 2, non-standard elements)	$X = M$
the third and subsequent odd graphs of standard elements the fourth and the subsequent even graphs of non-standard elements	$X_i = X_{i-1} - K_{rav} * h_1$
the fourth and subsequent even graphs of standard elements (up to L_{mid}) fifth and subsequent odd graphs of non-standard elements (up to L_{mid})	$X_i = X_{i-2} * (L^*_o - A_i) / (L^*_o - A_{i-2}) - h_1 * (K_{rav} - 1)$
the fourth and the subsequent even graphs of standard elements (after L_{mid}) the fifth and the subsequent odd graphs of non-standard elements (after L_{mid})	$X_i = X_{i-2} * (L_o - A_i) / (L_o - A_{i-2}) - h_1 * (K_{rav} - 1)$

In the final version of the "T-key", we took the following values of the coefficients: Krav= 1,8 and Kdef = 0,5. Krav with the specified value operates in line 5 of the table for isotopes with a total number of neutrons equal to 51, 83, 127, and in lines 6 and 7 for isotopes with a total number of neutrons equal to 52, 84, 128. In other cases, Krav = 1.

The values of the other parameters P, M, h1, h2, Lo, L*o used in the table are given above in the form of tables, graphs or formulas.

Results of calculating the cloud of isotopes according to the "T-key"

According to the algorithm (formula) of the "T-key" we constructed, we calculated the transformed cloud of isotopes, see Fig. 7_49.

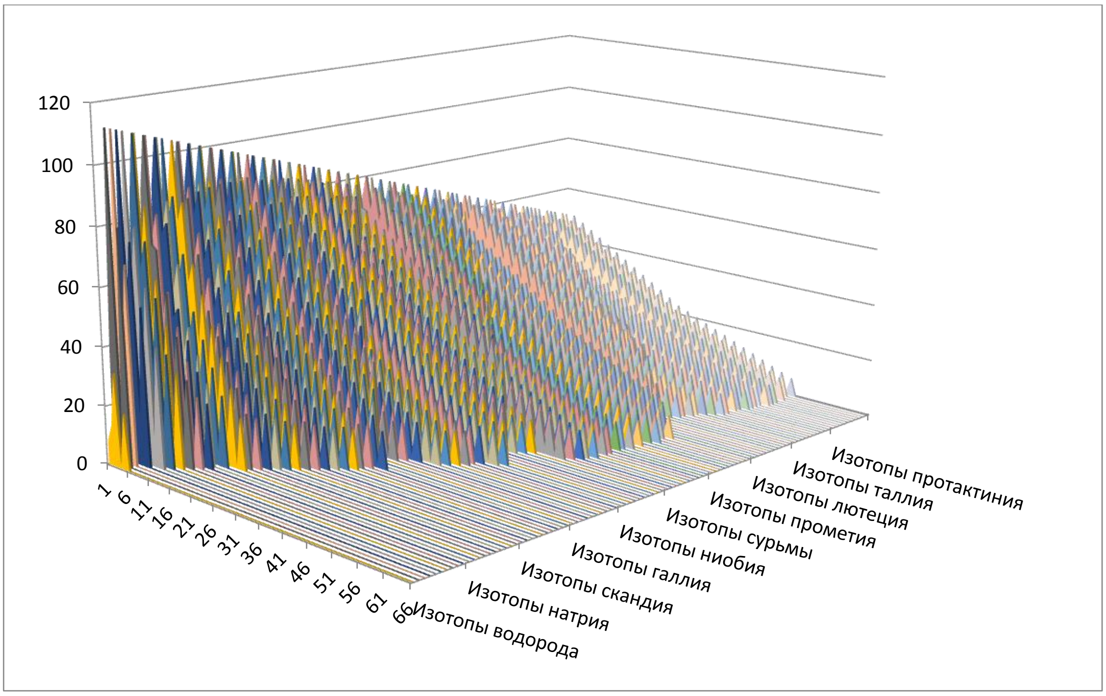


Fig. 7_49. Finishing "T-key"

The data of the transformed cloud were recalculated into the original form of the isotope cloud and the graphs of the specific binding energy of nucleons for main-stream isotopes (the number of mu-neutrino bursts per nucleon) and "rooks" for the entire isotope cloud (the number of mu-neutrinos remaining in the isotope nucleon).

The results are shown in Figures 7_50 and 7_51.

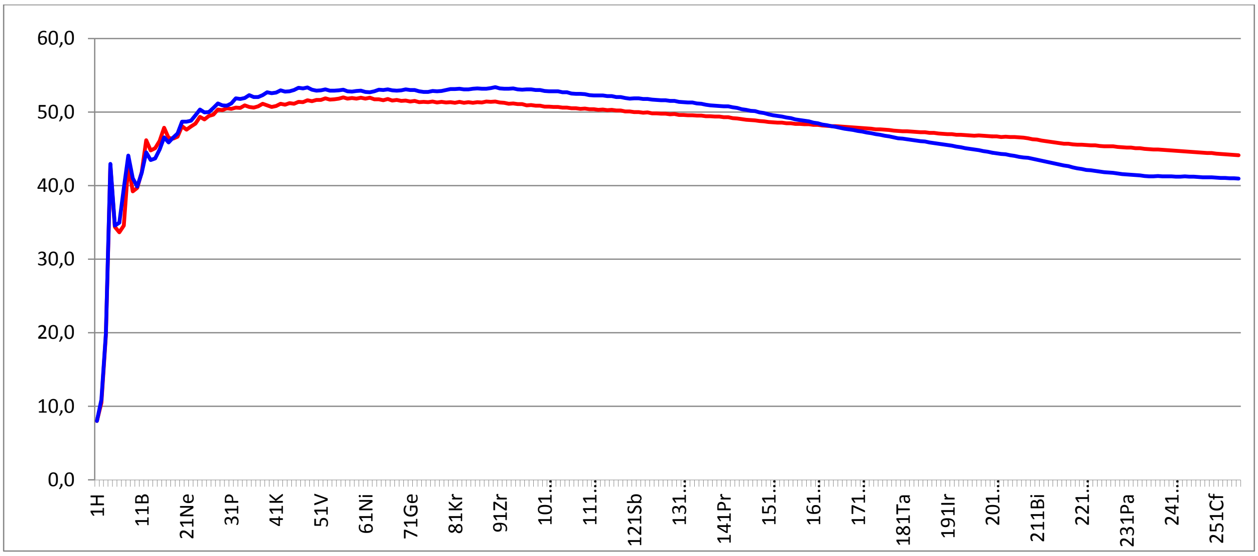


Fig. 7_50. A graph of the number of bursting mu-neutrinos in main-stream for the final version of the theoretical "key" (blue line) and the required graph of the binding energy based on reference isotope masses (red line)

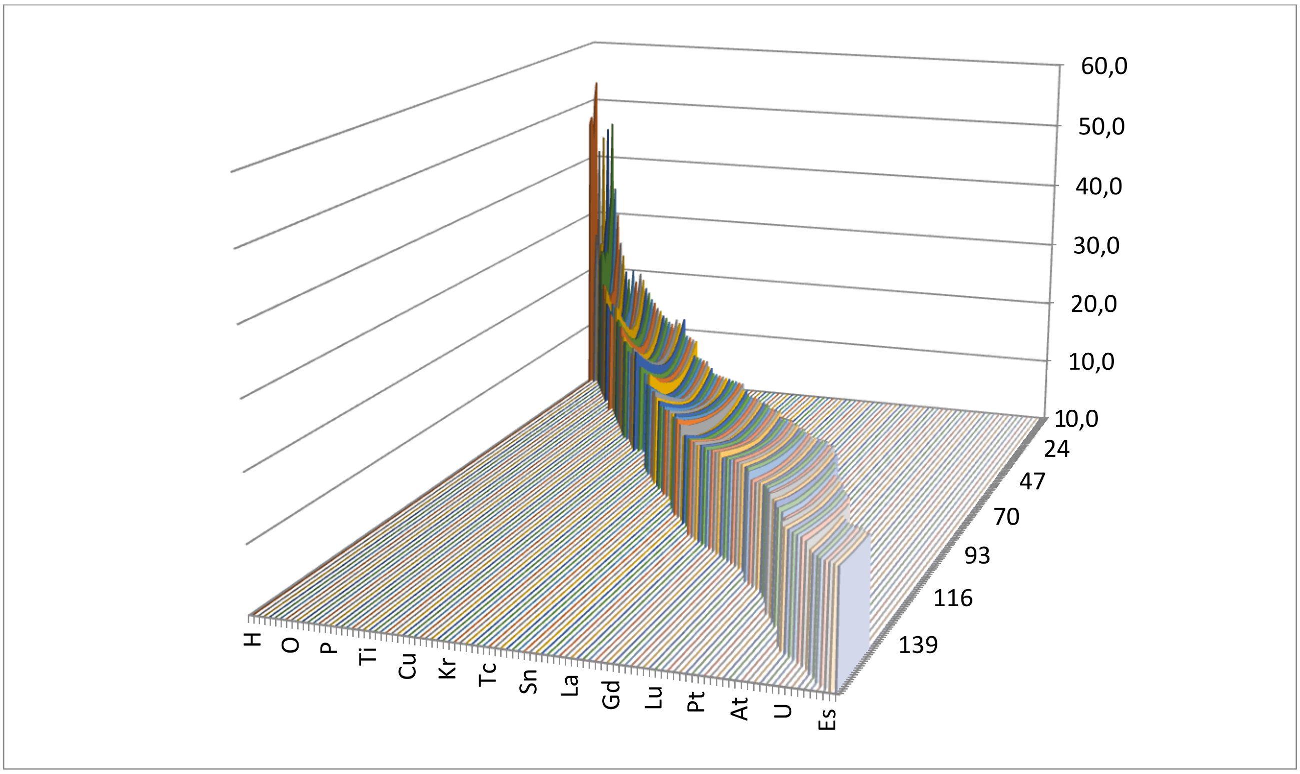


Fig. 7_51. "Rook" for the final version of the "T-key"

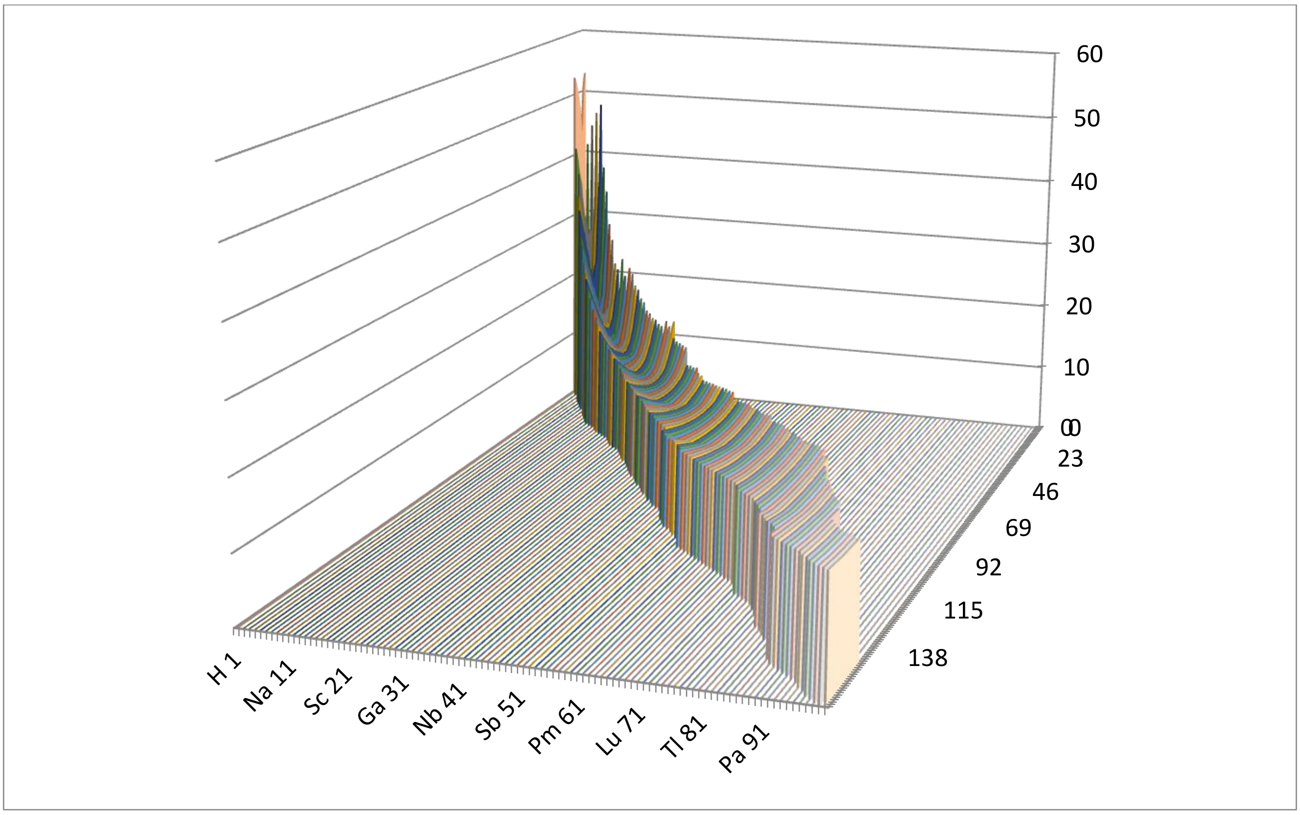


Fig. 7_52. "Rook" for the initial cloud of isotopes ("E-key")

Next to the "T-rook" schedule we gave the "E-rook" chart for a visual comparison.

To better estimate the degree of coincidence (or difference) between these two "rooks", we plot their minimal points in each row of isotopes of one element, Fig. 7_53.

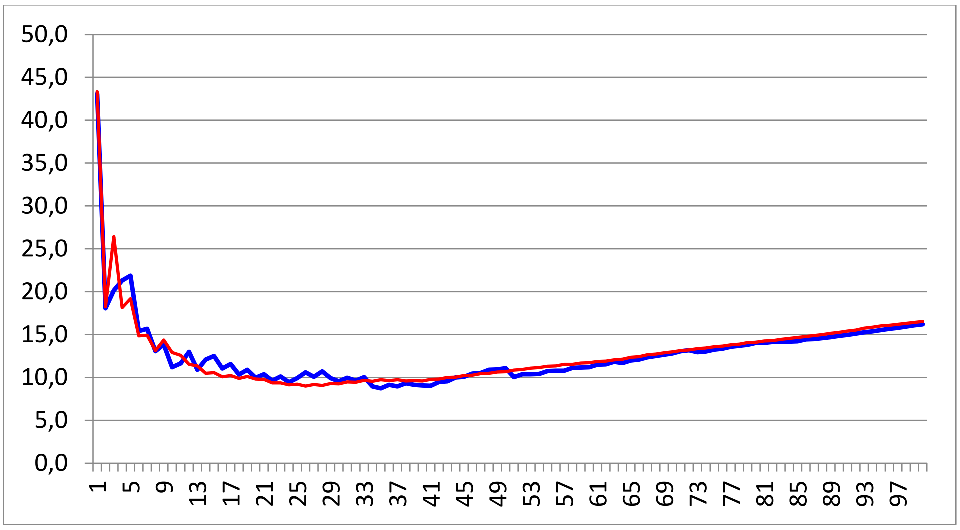


Fig. 7_53. Graphs of minimum points in the ranks of isotopes

As you can see, all the above graphs show good agreement between theoretical and experimental results.

Correlation of S-models of nucleons and regularities (CODE) of the process of nr-nucleosynthesis

We have already noted the surprising coincidence of the deterministic range of the number of mu-neutrinos in S_models of nucleons (from 61 to 9 pcs.) with the experimental data of mass defects in the nucleosynthesis of the mass spectrum of isotopes.

And the very idea of the realization of the appearance of mass defects in nuclear reactions through the process of mu-neutrino bursting in S-models of nucleons is "expensive". From this idea follows a grandiose investigation of different masses of protons and neutrons, as well as α particles, in different isotopes. And, although this idea and the given investigation are not yet confirmed experimentally, we have no doubt that this will happen sooner or later.

In this chapter, we again correlated the dynamics of the change in the reference experimental data (isotope masses) with a certain set of "regularities" of the process of nr_nucleosynthesis resulting from the electromagnetic and "mechanical" properties of the S_models of nucleons and the isotopes constructed from them.

On the experimental side, we have revealed and analyzed the regularities of the change in the mass defects of isotopes in the process of nucleosynthesis, recalculated into certain new units - "burst mu-neutrinos."

And from the side of S_theory we built S_models of interaction of such elements of of isotopes, as: electric dipole moments and slotted magnets of nucleons, directions of their magnetic moments, number of flagellums of gluons, elasticity and ultimate strength of simples, etc.

As a result, we succeeded, within the framework of the proposed S-models, to explain the majority of the revealed patterns of changes in the mass defects of isotopes during nucleosynthesis, and to propose a theoretical model ("T-key") for calculating the number of bursting mu-neutrinos at each step of the nr_nucleosynthesis process of the isotope cloud along the Horizontal algorithm, which is an indirect confirmation of the correctness of the S_models of relict neutron and nucleons developed by us.

Instead of the conclusion of Chapter 7

But on this, we are not yet finishing our consideration of the mathematical model of the "T-key". Now we have to go back two chapters .

The matter is that we, conducting an S_ analysis of the process of nr_nucleosynthesis and the construction of the T-CODE ("T-key") of this process, have done only "half" of the work.

It is an artificial restriction on our part of the process of nr_nucleosynthesis, the so-called "Horizontal Algorithm" for the formation of an isotope cloud. Now we have to analyze the question - was there an alternative to this algorithm?

Given the incompleteness of the issue under consideration, we will not now formulate the conclusion of Chapter 7, but we will do this later.

Chapter 8. Vertical algorithm of nr_nucleosynthesis of isotope clouds

When calculating nr_nucleosynthesis in an isotope cloud and simulating these reactions in order to search for the CODE of this process in the previous chapters, we used the so-called. "Horizontal algorithm" for the formation of a cloud of isotopes (see Fig. 6_1.).

This algorithm allowed us to calculate the process of nr_nucleosynthesis of the entire isotope cloud, and also made a significant "contribution" to the discovery of the regularities of this process that we discovered. One of these regularities is "waves" - pairwise grouping in pairs of successive neutrons. In each pair of neutrons, their "hoops of quarks" (slit magnets) are attracted to each other as closer as possible, deforming the "hoops" of the tau-neutrinos and forming "four-leaf ", while in this pair of neutrons an increased amount of mu-neutrinos bursts. Conversely, an increased distance between the slit magnets of the two adjacent "four-leaf" leads to a reduced attraction force between them, and as a consequence a reduced number of bursting mu-neutrinos (see Fig. 7_26).

As a result, a stable wave-like regularity is formed in the number of bursting mu-neutrinos. This regularity clearly manifests itself both in the isotope groups of one element (see Fig. 7_31) and in the formation of a global "wave" covering all the isotopes of the cloud along the neutron axis with alternation of an increased number of bursting mu-neutrinos in even neutrons and a reduced number of bursting mu-neutrinos in odd neutrons (see Fig. 7_32, 7_33).

To further illustrate the last statement, we take a graph of the number of bursting mu-neutrinos at each step of nr_nucleosynthesis according to the main-stream scheme (see Fig. 8_1). We remove their steps nr_nucleosynthesis, during which the relic neutron turned into a proton. In the graph obtained in this way (see Fig. 8_2), which contains only neutrons, we find an explicit global regularity in the number of bursting mu-neutrinos: up-down-up-down-... etc., indicating a pairwise neutron grouping. The acceptability of the deletion of protons from the graph was discussed in detail in the previous chapter.

The resulting global "wave" along the neutron axis (N), seems to confirm that the process of nr_nucleosynthesis of the isotope cloud was based on the "Horizontal Algorithm" with the preferential addition of neutrons. Honestly, we initially, sincerely, were confident of this, and therefore we constructed the S_model of the process of nr_nucleosynthesis based on the "Horizontal Algorithm".

However, if such a procedure of converting the main-stream graph is will done once more, only to remove from it not protons, and neutrons (along the proton axis to remove all the steps in which the relic neutron turned into a neutron), then we will find a similar undulating pattern, by axis of the protons (Z), see Fig. 8_3.

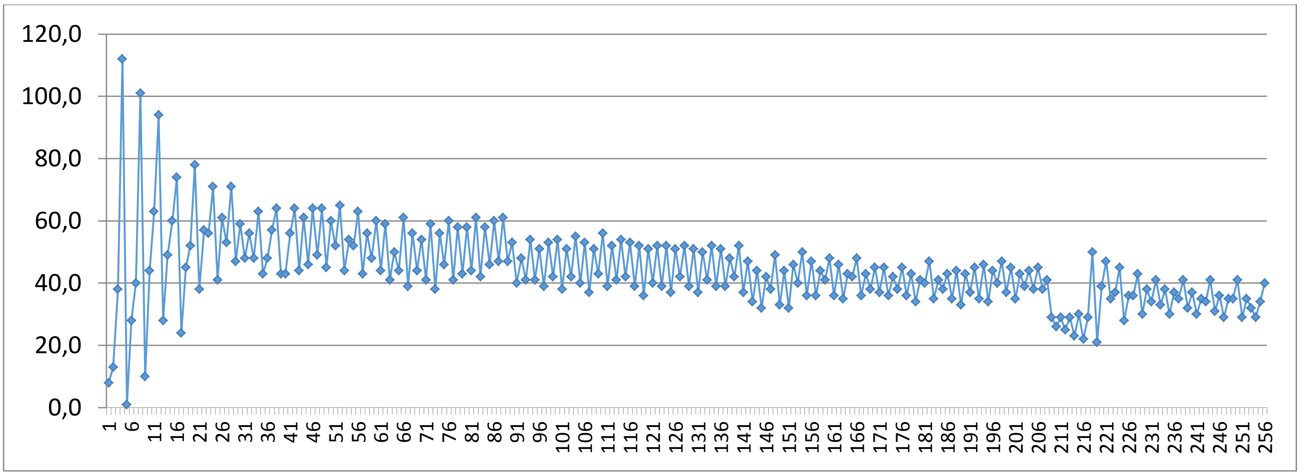


Fig. 8_1. The mu-neutrino burst at each step of nr_nucleosynthesis (pcs)

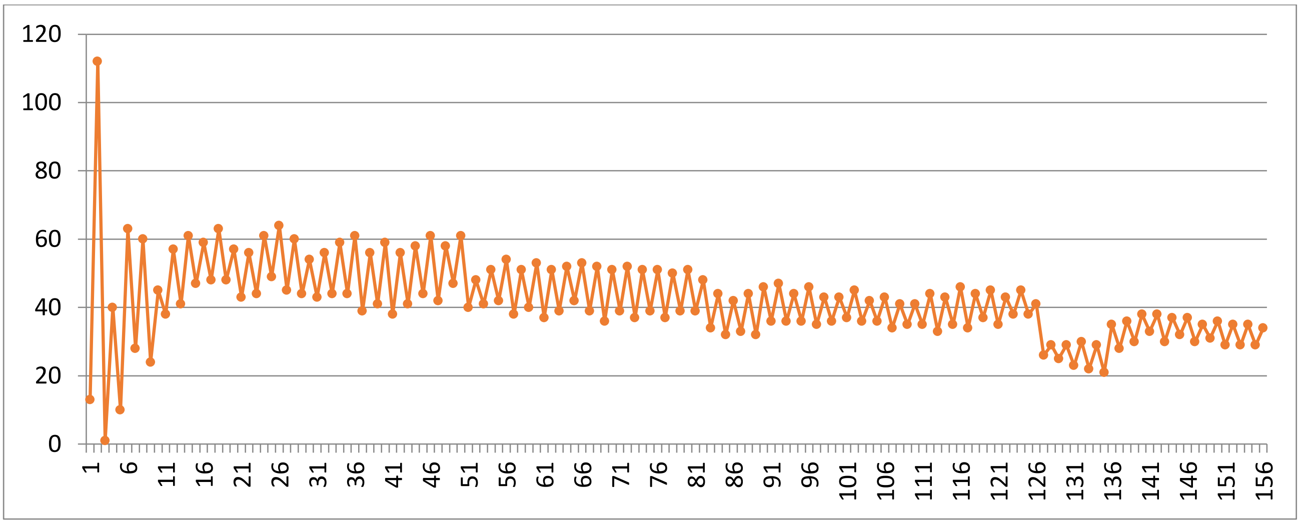


Fig. 8_2. The global wave of the number of bursting mu-neutrinos along the N axis

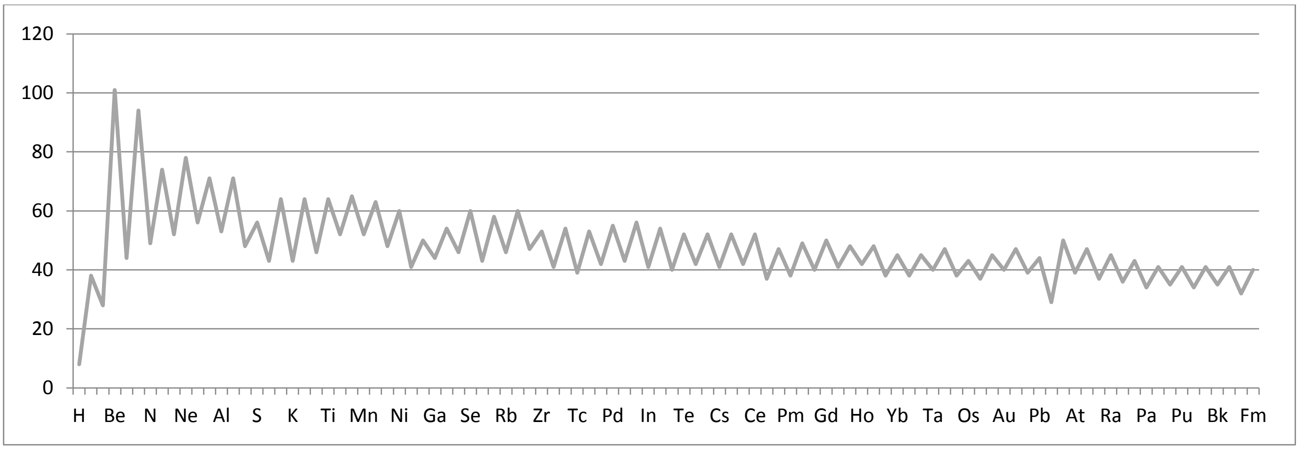


Fig. 8_3. The global wave of the number of bursting mu neutrinos along the Z axis

As we see along the OZ axis, there is also same wave-like process of the number of bursting mu-neutrinos with maxima in isotopes (elements) with an even number of protons, and minima in isotopes (elements) with an odd number of protons. Those. the picture is completely analogous to the pairing of neutrons along the ON axis. And this means that the protons are also grouped in pairs, and along the OZ axis a "wave" is also formed in the number of bursting mu-neutrinos. This is absolutely natural given the identity of the slit magnets of protons and neutrons.
As a result, both data of the process of pairwise grouping of the same nucleons go, as it were, in the orthogonal planes, without affecting the alternation of even and odd maxima and minima of each other.
This circumstance "forces" us to assume complete symmetry, the regularities revealed by us, both along the neutron axis and along the proton axis.
This conclusion obliges us to calculate the process of nr_nucleosynthesis using the "Vertical Algorithm" for forming an isotope cloud (see Figure 8_4), and also to attempt to construct a CODE (theoretical "key") and for the "Vertical Algorithm".

	N	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Эл	Z																	
H	1	1H →	2H →	3H →	4H →	5H →	6H →	7H										
			↓	↓	↓	↓	↓	↓										
He	2		3He	4He	5He	6He	7He	8He →	9He →	10He								
			↓	↓	↓	↓	↓	↓	↓	↓								
Li	3		4Li	5Li	6Li	7Li	8Li	9Li	10Li	11Li →	12Li							
			↓	↓	↓	↓	↓	↓	↓	↓	↓							
Be	4		5Be	6Be	7Be	8Be	9Be	10Be	11Be	12Be	13Be →	14Be →	15Be →	16Be				
			↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓				
B	5		6B	7B	8B	9B	10B	11B	12B	13B	14B	15B	16B	17B →	18B →	19B		
				↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		
C	6			8C	9C	10C	11C	12C	13C	14C	15C	16C	17C	18C	19C	20C →	21C →	22C
					↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
N	7				10N	11N	12N	13N	14N	15N	16N	17N	18N	19N	20N	21N	22N	23N
						↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
O	8					12O	13O	14O	15O	16O	17O	18O	19O	20O	21O	22O	23O	24O
							↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
F	9						14F	15F	16F	17F	18F	19F	20F	21F	22F	23F	24F	25F
								↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
Ne	10							16Ne	17Ne	18Ne	19Ne	20Ne	21Ne	22Ne	23Ne	24Ne	25Ne	26Ne
									↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
Na	11								18Na	19Na	20Na	21Na	22Na	23Na	24Na	25Na	26Na	27Na
									↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
Mg	12								19Mg	20Mg	21Mg	22Mg	23Mg	24Mg	25Mg	26Mg	27Mg	28Mg
										↓	↓	↓	↓	↓	↓	↓	↓	↓
Al	13									21Al	22Al	23Al	24Al	25Al	26Al	27Al	28Al	29Al
										↓	↓	↓	↓	↓	↓	↓	↓	↓
Si	14									22Si	23Si	24Si	25Si	26Si	27Si	28Si	29Si	30Si
											↓	↓	↓	↓	↓	↓	↓	↓
P	15										24P	25P	26P	27P	28P	29P	30P	31P
												↓	↓	↓	↓	↓	↓	↓
S	16											26S	27S	28S	29S	30S	31S	32S
													↓	↓	↓	↓	↓	↓
Cl	17												28Cl	29Cl	30Cl	31Cl	32Cl	33Cl
														↓	↓	↓	↓	↓
Ar	18													30Ar	31Ar	32Ar	33Ar	34Ar
															↓	↓	↓	↓
K	19														32K	33K	34K	35K
																↓	↓	↓
Ca	20															34Ca	35Ca	36Ca
																	↓	↓
Sc	21																36Sc	37Sc
																		↓
Ti	22																	38Ti

Fig. 8_4. "Vertical algorithm" for the formation of an isotope cloud

The formation of a cloud of isotopes according to the "Vertical Algorithm"

To carry out calculation of the process of nr_nucleosynthesis by the "Vertical Algorithm" is not a big difficultfor us, because at our disposal there is a ready mathematical model for calculating nr_nucleosynthesis using the "Horizontal Algorithm" for the formation of an isotope cloud. It is enough for us to correct the parent isotope for each cloud isotope, the algorithms for calculating all the remaining graphs are preserved. Therefore, we immediately turn to the presentation of the results of the "work of the Vertical Algorithm".

First of all, we give a graph of the number of burst mu-neutrinos for nr_nucleosynthesis of each cloud isotope ("E-key" - vertical), see Fig. 8_5.

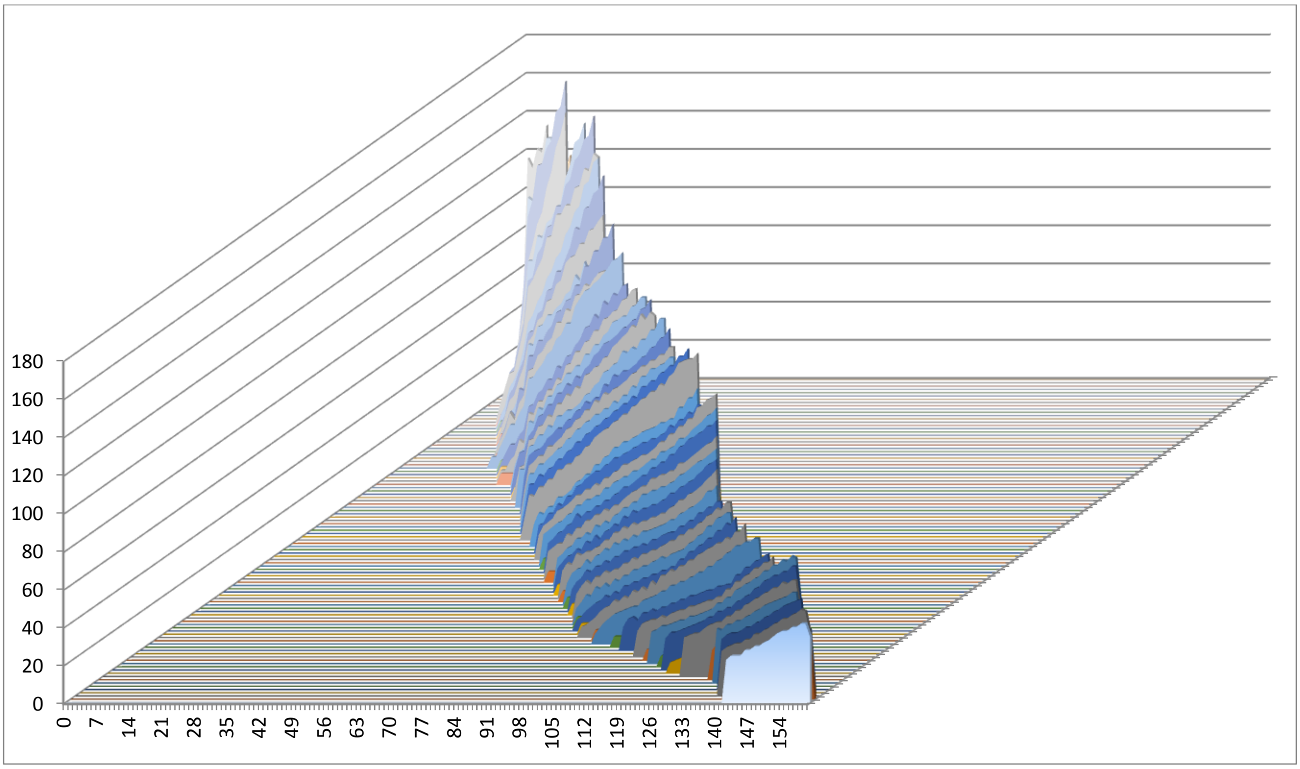


Fig. 8_5. The number of bursting mu-neutrinos in the formation of a cloud of isotopes according to the "Vertical Algorithm" (the ranks are chosen along the N axis)

For comparison, we immediately show again the graph of the number of bursts of mu-neutrinos constructed with the same foreshortening under the "Horizontal Algorithm" for the formation of an isotope cloud ("E-key" - horizontal), see Fig. 8_6.

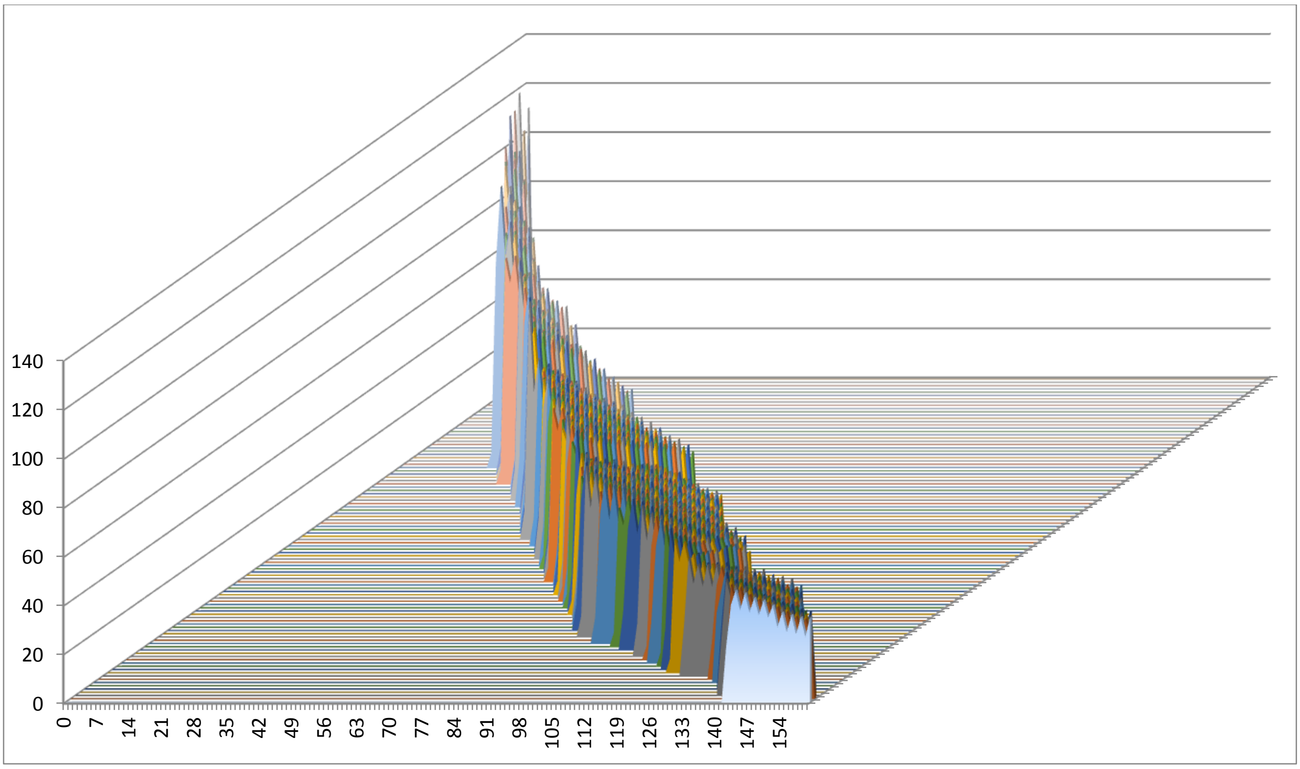


Fig. 8_6. The number of bursting mu-neutrinos in the formation of a cloud of isotopes along the "Horizontal Algorithm" from the same view angle (the ranks are chosen along the N axis)

As you can see, we got two completely different "pictures".
Let's now check how the new graph of the number of bursted mu-neutrinos will be looks to one nucleon in the main-stream isotope chain and the new rook calculated for the "Vertical Algorithm".
Let's start with the graph of the binding energy and, again, for comparison, we immediately give this graph for the "Horizontal Algorithm" (Fig. 8_7, 8_8).

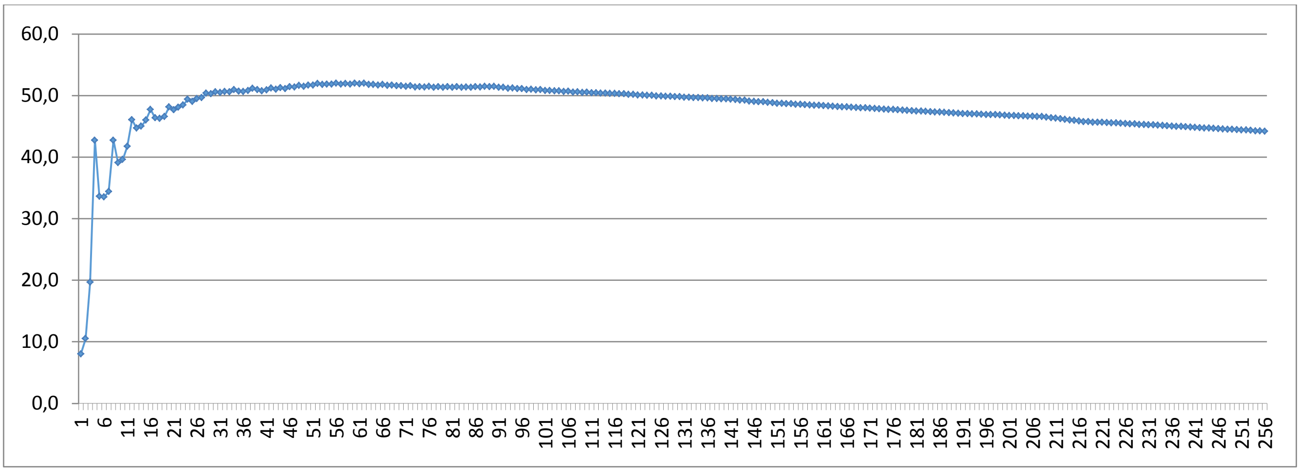


Fig. 8_7. The number of burst mu-neutrinos per nucleon in the formation of the main-stream isotope chain by the "Vertical Algorithm"

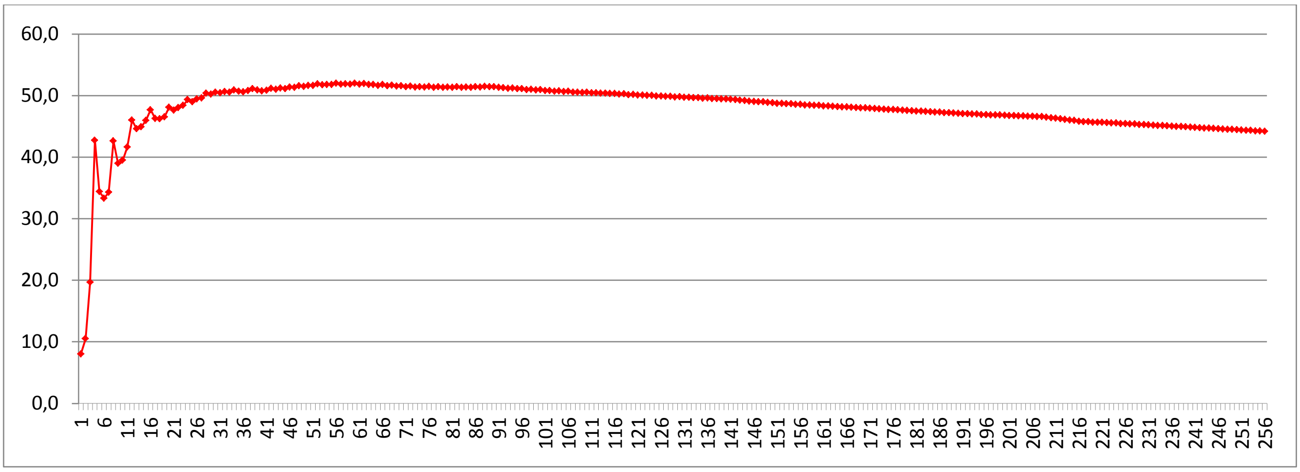


Fig. 8_8. The number of burst mu-neutrinos per nucleon in the formation of the main-stream isotope chain by the "Horizontal Algorithm"

As you can see, these two graphics are absolutely identical, if they impose one another, they practically coincide.
Now let's look at the new "rook" from both sides (Figures 8_9 and 8_10).

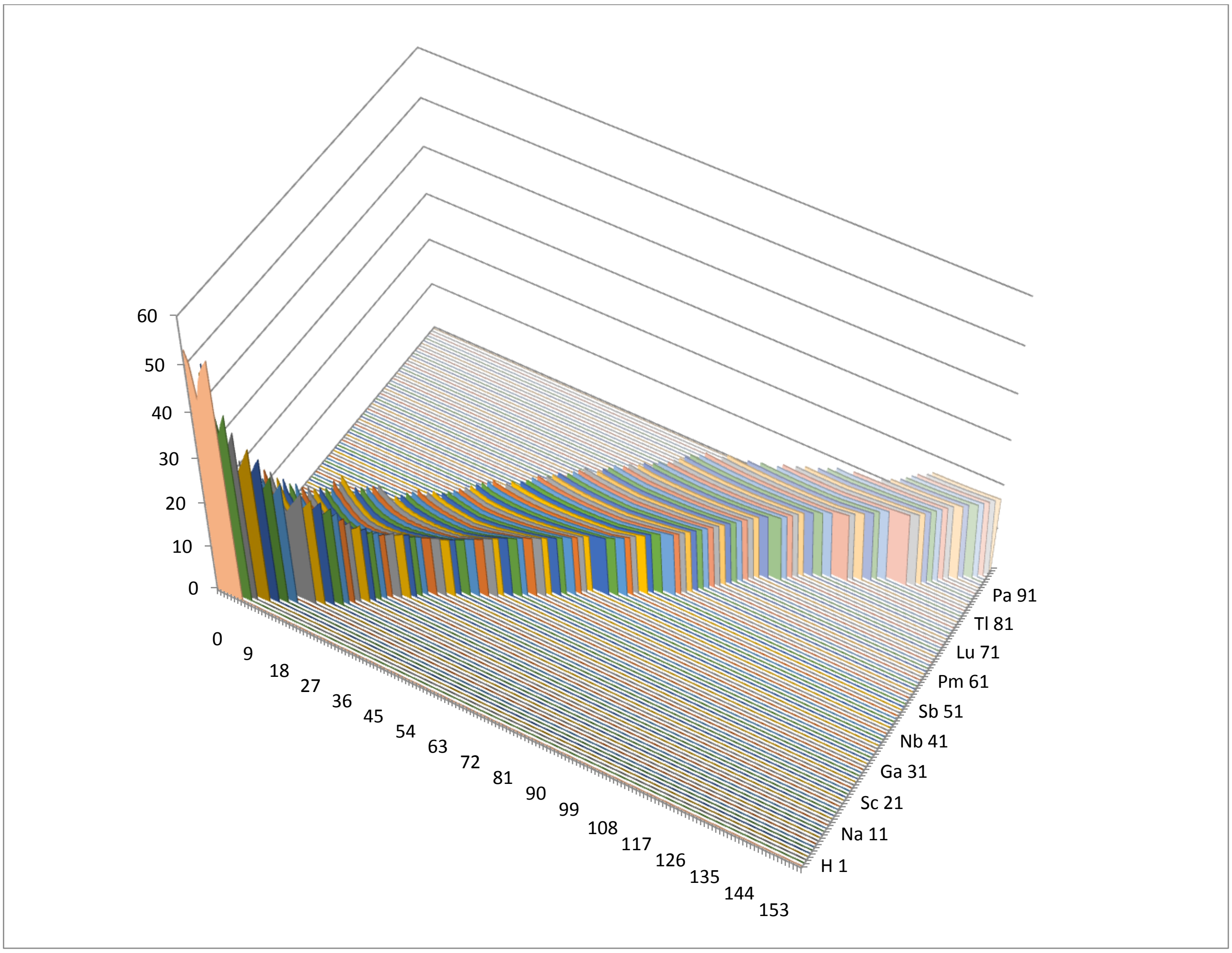


Fig. 8_9. "Rook" in the formation of a cloud of isotopes along the "Vertical Algorithm" (view from the "side of the boad of rook", the rows are chosen along the N axis)

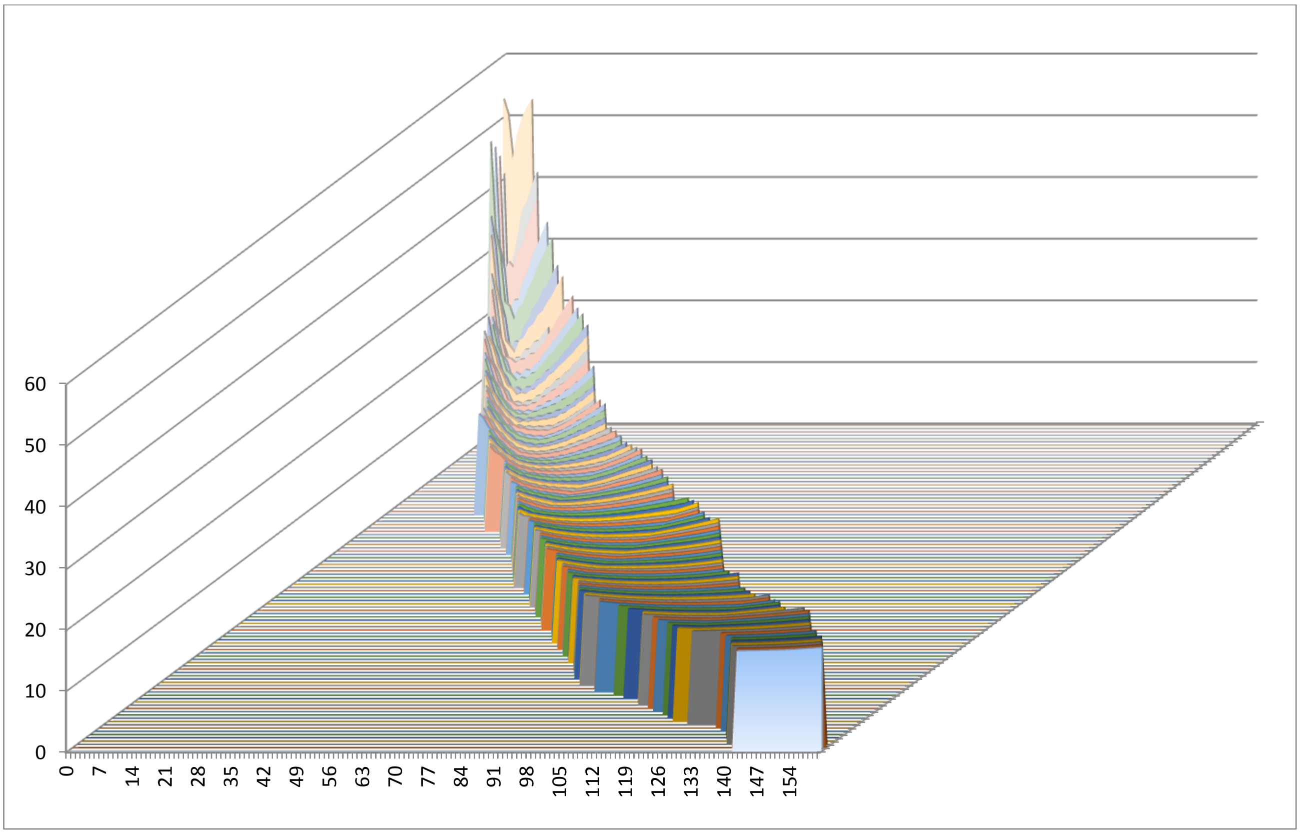


Fig. 8_10. "Rook" in the formation of a cloud of isotopes along the "Vertical Algorithm" (view from the "stern of the rook", the rows are chosen along the N axis)

We will not give here the graphs of the "rook" for the "Horizontal Algorithm", believe us, they are absolutely identical. Those wishing to be convinced of this can look at Fig. 6_2 and 6_3.
And what does all this mean? The number of bursting mu-neutrinos in specific isotopes according to the "Horizontal Algorithm" and "Vertical Algorithm" is completely different (see Figures 8_5 and 8_6), and the resulting graphs of the Communication Energy and the "Rooks" are absolutely identical.
Readers, of course, have already noticed that the graphs of the number of bursting mu-neutrinos in each isotope are not just different, and their dynamics of change are "diametrically opposed". Those. between them there is "some kind of" inverse symmetry. If, under the "Horizontal Algorithm", the number of bursting mu-neutrinos along the axis ON wave-like decreases, then, under the "Vertical Algorithm", on the contrary, along the axis ON grows, although not by "wave", but by a broken monotonically growing line.
Conversely, with the "Vertical Algorithm", the number of bursting mu-neutrinos along the OZ axis wavers like a wavy wave down, but in the case of the "Horizontal Algorithm", on the contrary, along the OZ axis it increases, although not by a "wave", but by a broken, monotonically growing line.
In order to better understand this symmetry, we give the initial part of the table of the number of bursting mu-neutrinos for the "Vertical Algorithm", Fig. 8_11

эл.	p\n	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
H	1	8	13	32	1	1	1	1																									
He	2		38	118	118	123	121	135	1	1																							
Li	3		6	6	28	62	75	83	83	85	1																						
Be	4		6	6	39	101	99	114	117	132	132	9	1	1																			
B	5		6	6	9	8	44	69	84	94	99	107	107	114	1	4																	
C	6			6	15	30	55	94	103	121	122	130	134	149	152	165	1	4															
N	7				6	6	12	19	49	63	70	79	90	97	105	114	121	128	1	1													
O	8					6	17	33	48	74	83	94	100	113	121	134	141	152															
F	9						6	6	6	12	39	52	66	68	76	80	86	90	7	9	1	6	1	2									
Ne	10							6	17	30	43	78	78	91	90	98	100	106	108	121	128	140	142	150	1	3							
Na	11								6	7	20	22	45	56	65	66	73	80	91	94	100	104	111	114	115	121	1	4					
Mg	12								6	23	26	38	49	71	73	85	89	99	100	110	110	121	124	134	137	145	147	157	1	6			
Al	13									6	9	9	19	21	42	53	60	65	76	80	90	89	90	96	104	109	119	121	122	126	2		
Si	14									10	18	26	27	38	49	71	75	81	86	97	98	109	109	114	114	123	124	133	132	141	139	12	
P	15										6	6	9	13	20	23	39	48	55	60	70	74	79	83	92	95	102	106	116	116	126	128	4
S	16											7	12	22	26	32	42	56	60	67	71	79	83	90	93	102	106	114	117	128	130	140	142
Cl	17												6	6	7	10	17	21	36	43	51	54	63	64	71	72	79	83	92	97	109	108	116
Ar	18													6	11	22	26	34	40	54	55	64	66	76	77	86	86	93	99	109	108	119	120
K	19														6	6	6	9	17	18	36	43	49	51	58	59	68	69	78	80	81	83	87
Ca	20															6	14	22	25	33	40	53	56	64	66	74	75	83	85	94	97	98	104
Sc	21																6	6	6	6	11	14	31	35	45	46	53	54	59	60	65	67	72
Ti	22																	6	10	18	22	29	33	55	54	64	65	70	70	74	76	81	83
V	23																		6	6	7	10	20	17	37	36	45	45	51	52	57	61	64
Cr	24																			9	15	23	20	35	34	52	52	60	60	65	68	75	76
Mn	25																				6	6	12	9	20	20	33	37	44	44	49	52	57
Fe	26																				6	12	17	26	22	31	35	48	49	56	58	63	65
Co	27																					6	6	6	8	9	14	17	32	36	40	41	46
Ni	28																					6	6	12	17	23	23	29	33	47	48	52	55
Cu	29																								6	6	6	7	11	12	24	27	33
Zn	30																									6	11	16	16	21	24	36	37
Ga	31																										6	6	6	6	9	10	24
Ge	32																											6	6	11	14	22	20
As	33																												6	6	6	6	8

Fig. 8_11. The number of bursting mu-neutrinos for the "Vertical Algorithm"

Brown isotopes are designated main-strem.

Violet color in the table indicates the wave process ("wave"), only now it goes along the axis of protons, rather than neutrons, as in the "Horizontal Algorithm". The wave maxima, just like in HA, are an even number of protons.

The red color indicates isotopes that are "knocked out" of the wave process. It is necessary to check their masses or the masses of their neighbors.

In Fig. 8_5 with the selected foreshortening (view from the "tail" of the cloud) and the choice of data series along the neutron axis, there was not view wave process for the "Vertical Algorithm". We will construct a new graph for the "Vertical Algorithm", in which to visualize the wave process, we select the ranks of data along the proton axis (see Fig. 8_12) and compare it with the wave process graph for the "Horizontal Algorithm" (see Figure 8_13).

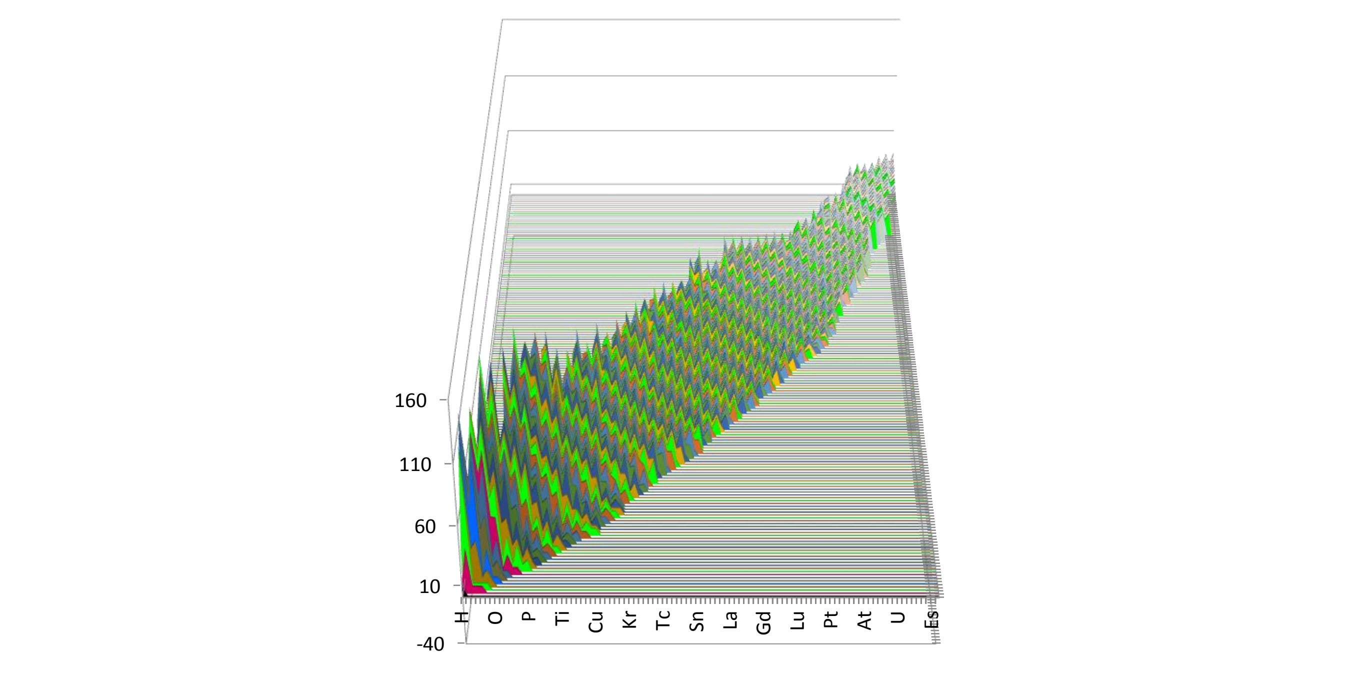


Fig. 8_12. The wave process for the "Vertical Algorithm" (data selected along the OZ axis)

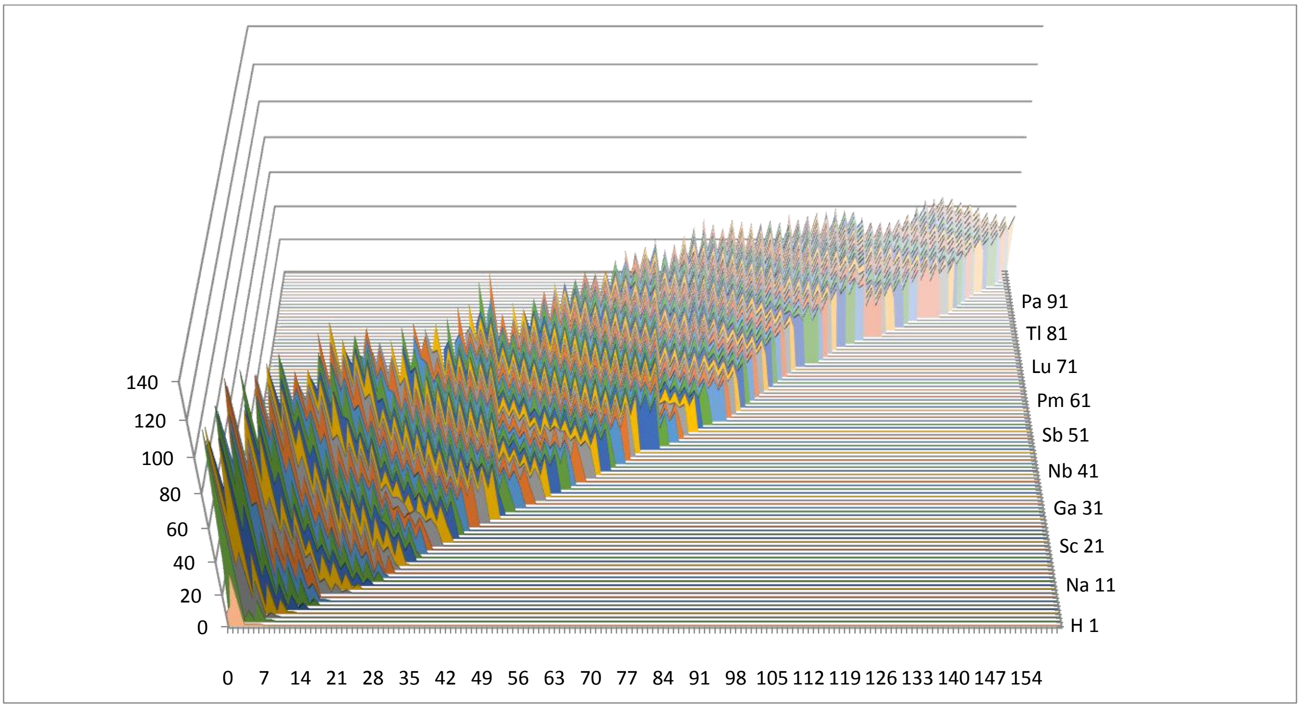


Fig. 8_13. The wave process for the "Horizontal Algorithm" (data selected along the axis ON)

Automatic selection of colors in the series of graphs is not very successful, recoloring them manually is too laborious, but even so we see that the wave process of mu-neutrino bursting is inherent in both algorithms, only it goes along the orthogonal axes of the isotope cloud.
We also see that both here and there wave processes go with decreasing, forming "mountains ".
And if we look again at the table of the number of bursting mu neutrinos for the "Vertical Algorithm," we will find "clamps " in it, only they are formed along the axis of protons, not neutrons.
Proceeding from all told, the symmetry found between "Vertical algorithm" (VA) and "Horizontal algorithm" (HA) can be named from the point of view of geometry "orthogonal". From the point of view of physics, this symmetry

indicates the complete identity of the regularities of isotope formation in the "vertical" and "horizontal" algorithms, i.e. full identity of protons and neutrons in terms of the formation of SIF forces.
This symmetry leads to the fact that the total number of burst mu-neutrinos in each isotope coincides for "Vertical" and "Horizontal" algorithms. (see Figures 8_14 and 8_15).

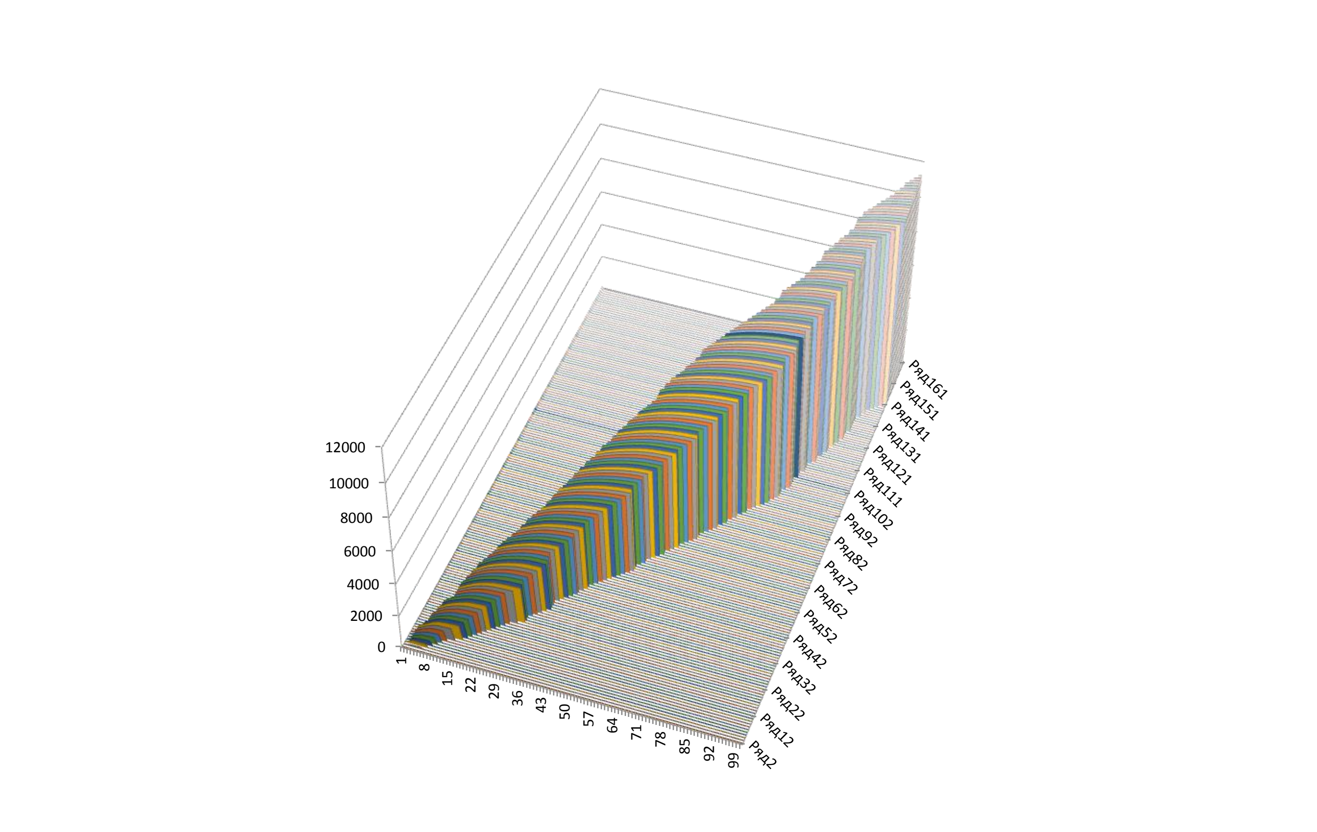


Fig. 8_14. The total number of bursting mu-neutrinos in the isotope for "Vertical Algorithm"

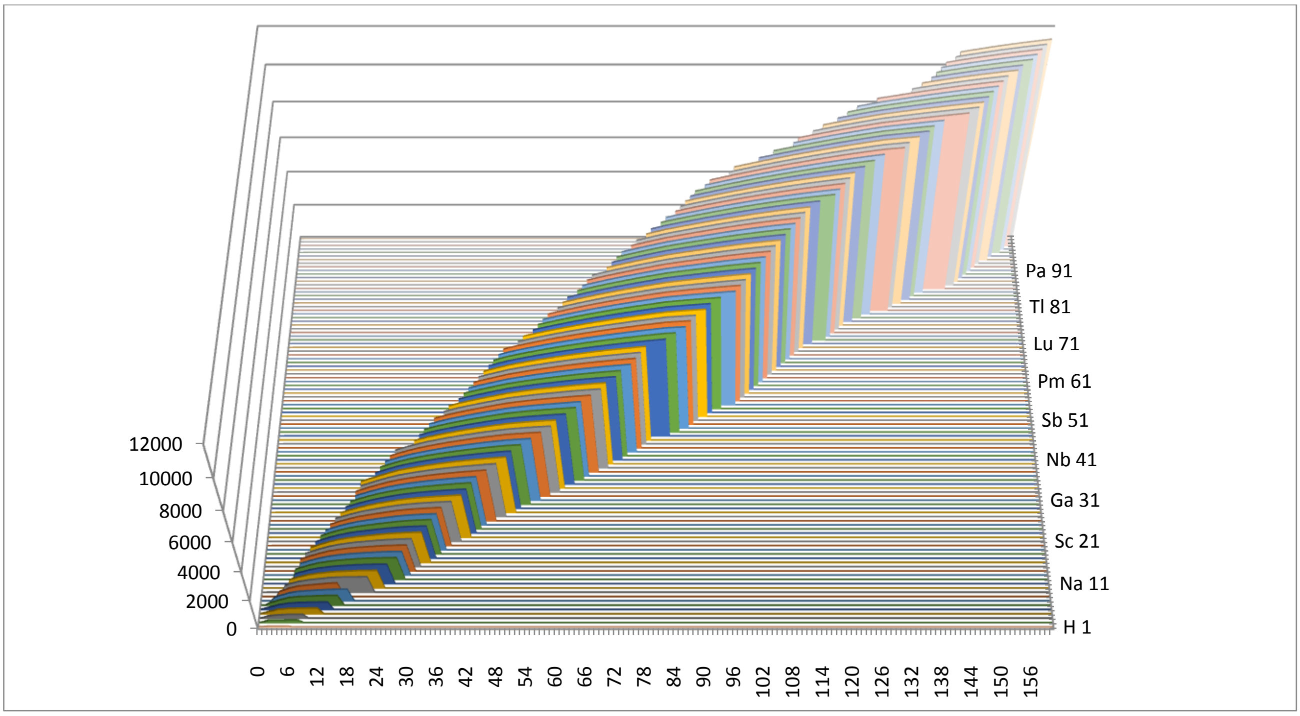


Fig. 8_15. The total number of bursting mu-neutrinos in the isotope for the "Horizontal Algorithm"

We will not affirm that the total number of burst mu-neutrinos for VA and HA is absolutely the same for all isotopes, there is a slight difference within several mu-neutrinos between them. We will return to this difference in the next chapter.
Now we can state that "Vertical" and "Horizontal" algorithms give essentially the same result, from the point of view of formation of a cloud of isotopes.
Just a new question arises - what is the theoretical "key" for the "Vertical Algorithm"? After all, the theoretical "key", in our understanding, is a formula for calculating the number of bursting mu-neutrinos at each step of nr_nucleosynthesis, and it, as we have seen, is completely different for "Vertical" and "Horizontal" algorithms, see Fig. 8_5 and 8_6.
To answer this question, we will have to build a theoretical "key" for the "Vertical Algorithm".

Construction of a theoretical key for the "Vertical Algorithm"

The theoretical "key" for the "Vertical Algorithm" will be constructed in the same way as for the "Horizontal Algorithm".
The difference lies in the fact that we will carry out the transformation of the initial isotope cloud by "clamping" (lifting) the vertical rows (groups) of isotopes up to the neutron axis (ON). Below we present the resulting table of the transformed cloud of isotopes, see Table. 12 The coordinate system in the table is again changed, along the vertical axis there is the neutron axis (from 0 to 159), and the number of protons in the vertical isotope groups is plotted horizontally.

Table 12. The transformed cloud of isotopes according to the "Vertical Algorithm"

р за	A^* =	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
скоб	n/p*	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	1	13	38	6	6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	2	32	118	6	6	6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	3	1	118	28	39	9	15	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	4	1	123	62	101	8	30	6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	5	1	121	75	99	44	55	12	17	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	6	1	135	83	114	69	94	19	33	6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	7	1	83	117	84	103	49	48	6	17	6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	8	1	85	132	94	121	63	74	12	30	7	23	6	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	9	1	132	99	122	70	83	39	43	20	26	9	18	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	10	9	107	130	79	94	52	78	22	38	9	26	6	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	11	1	107	134	90	100	66	78	45	49	19	27	9	12	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	12	1	114	149	97	113	68	91	56	71	21	38	13	22	6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	13	1	152	105	121	76	90	65	73	42	49	20	26	7	11	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	14	4	165	114	134	80	98	66	85	53	71	23	32	10	22	6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	15	1	121	141	86	100	73	89	60	75	39	42	17	26	6	14	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	16	4	128	152	90	106	80	99	65	81	48	56	21	34	9	22	6	6	0	0	0	0	0	0	0	0	0	0	0	0	0
8	17	7	108	91	100	76	86	55	60	36	40	17	25	6	10	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	18	9	121	94	110	80	97	60	67	43	54	18	33	6	18	6	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	19	1	128	100	110	90	98	70	71	51	55	36	40	11	22	7	15	6	6	0	0	0	0	0	0	0	0	0	0	0	0
8	20	6	140	104	121	89	109	74	79	54	64	43	53	14	29	10	23	6	12	6	6	0	0	0	0	0	0	0	0	0	0
8	21	1	142	111	124	90	109	79	83	63	66	49	56	31	33	20	20	12	17	6	6	0	0	0	0	0	0	0	0	0	0
8	22	2	150	114	134	96	114	83	90	64	76	51	64	35	55	17	35	9	26	6	12	0	0	0	0	0	0	0	0	0	0
9	23	1	115	137	104	114	92	93	71	77	58	66	45	54	37	34	20	22	8	17	6	0	0	0	0	0	0	0	0	0	0
9	24	3	121	145	109	123	95	102	72	86	59	74	46	64	36	52	20	31	9	23	6	6	0	0	0	0	0	0	0	0	0
10	25	1	147	119	124	102	106	79	86	68	75	53	65	45	52	33	35	14	23	6	11	6	0	0	0	0	0	0	0	0	0
10	26	4	157	121	133	106	114	83	93	69	83	54	70	45	60	37	48	17	29	7	16	6	6	0	0	0	0	0	0	0	0
11	27	1	122	132	116	117	92	99	78	85	59	70	51	60	44	49	32	33	11	16	6	6	6	0	0	0	0	0	0	0	0
11	28	6	126	141	116	128	97	109	80	94	60	74	52	65	44	56	36	47	12	21	6	11	6	0	0	0	0	0	0	0	0
12	29	2	139	126	130	109	108	81	97	65	76	57	68	49	58	40	48	24	24	9	14	6	0	0	0	0	0	0	0	0	0
13	30	12	128	140	108	119	83	98	67	81	61	75	52	63	41	52	27	36	10	22	6	0	0	0	0	0	0	0	0	0	0
14	31	4	142	116	120	87	104	72	83	64	76	57	65	46	55	33	37	24	20	8	12	0	0	0	0	0	0	0	0	0	0
15	32	17	117	127	88	104	75	91	67	81	60	73	48	60	34	43	23	36	8	19	6	0	0	0	0	0	0	0	0	0	0
15	33	1	123	129	93	111	82	88	71	82	66	73	53	62	40	45	30	35	21	21	6	13	0	0	0	0	0	0	0	0	0
16	34	12	136	96	112	78	98	76	89	67	80	56	68	41	50	30	42	21	35	6	22	6	0	0	0	0	0	0	0	0	0
17	35	4	102	116	86	92	84	89	76	79	61	70	47	50	36	42	27	34	22	23	6	7	0	0	0	0	0	0	0	0	0
18	36	17	119	87	102	82	99	75	87	64	76	49	57	37	48	27	42	21	31	6	18	0	0	0	0	0	0	0	0	0	0
19	37	11	91	102	87	99	79	88	71	76	54	56	43	48	33	41	26	34	23	19	6	0	0	0	0	0	0	0	0	0	0
20	38	17	110	89	107	80	93	71	85	55	62	44	54	33	48	25	41	20	32	8	20	0	0	0	0	0	0	0	0	0	0
20	39	12	110	95	107	86	92	76	89	58	63	50	53	39	48	32	42	27	33	19	20	0	0	0	0	0	0	0	0	0	0
21	40	23	98	114	88	96	77	93	60	68	51	61	39	54	31	47	25	39	22	32	6	0	0	0	0	0	0	0	0	0	0

21	41	10	103	114	93	99	78	94	64	71	55	62	45	55	38	47	30	40	25	33	18	20	0	0	0	0	0	0	0	0	0
22	42	23	121	94	100	85	97	67	77	56	68	46	60	37	53	30	45	25	38	20	31	6	0	0	0	0	0	0	0	0	0
23	43	14	99	100	87	99	72	78	62	68	50	60	42	53	36	44	30	38	23	33	16	16	0	0	0	0	0	0	0	0	0
24	44	27	105	91	102	75	84	63	73	52	64	43	58	35	51	28	43	24	34	19	29	6	0	0	0	0	0	0	0	0	0
25	45	19	92	105	81	82	68	74	56	64	48	57	40	51	34	42	30	36	21	31	14	16	0	0	0	0	0	0	0	0	0
25	46	30	95	109	79	91	68	79	57	70	49	62	40	56	33	48	28	40	22	34	14	28	6	0	0	0	0	0	0	0	0
26	47	19	110	86	89	75	79	62	70	54	61	46	55	38	48	30	42	27	34	19	28	13	12	0	0	0	0	0	0	0	0
26	48	30	113	85	95	76	85	64	75	55	66	46	60	40	51	32	45	25	39	20	33	14	26	6	0	0	0	0	0	0	0
27	49	19	91	94	78	86	69	75	61	68	55	59	45	51	36	45	30	39	24	33	18	26	12	12	0	0	0	0	0	0	0
27	50	32	91	99	81	89	71	80	62	73	55	66	47	53	36	49	30	42	25	36	19	31	14	24	0	0	0	0	0	0	0
28	51	13	100	85	90	76	82	65	75	58	67	49	55	40	50	33	44	27	38	22	30	17	23	0	0	0	0	0	0	0	0
29	52	25	85	95	75	87	66	79	59	70	50	59	41	54	35	48	29	41	23	34	17	28	6	0	0	0	0	0	0	0	0
29	53	12	90	96	80	88	70	80	62	71	54	60	44	55	38	49	32	42	26	35	21	28	6	12	0	0	0	0	0	0	0
30	54	23	100	81	90	73	82	63	75	55	64	45	59	39	53	33	46	26	39	20	32	6	18	0	0	0	0	0	0	0	0
30	55	14	101	86	90	77	84	66	76	60	66	47	58	42	54	37	47	31	39	23	32	10	17	6	0	0	0	0	0	0	0
31	56	23	85	95	78	87	68	81	60	71	49	61	43	58	38	51	31	43	24	37	11	21	6	15	0	0	0	0	0	0	0
31	57	10	89	96	81	88	72	83	65	72	51	61	48	58	41	52	35	44	28	37	15	21	9	16	6	0	0	0	0	0	0
32	58	20	100	82	91	73	86	66	75	53	68	49	63	42	55	35	48	28	40	17	26	8	21	6	13	0	0	0	0	0	0
32	59	13	100	86	92	76	88	68	76	59	67	53	62	46	56	40	48	32	40	20	26	13	21	7	18	0	0	0	0	0	0
33	60	24	86	97	76	92	67	82	60	73	53	67	46	59	40	52	33	44	21	28	14	26	8	20	6	0	0	0	0	0	0
34	61	17	98	82	91	75	81	63	72	57	66	50	59	44	53	37	45	24	30	18	25	12	22	6	17	0	0	0	0	0	0
34	62	24	102	80	98	73	84	67	75	58	69	51	62	43	56	37	49	25	34	18	30	12	26	8	19	6	0	0	0	0	0
35	63	16	86	95	83	83	68	75	61	70	54	62	47	57	41	50	27	35	23	30	17	27	11	21	6	0	0	0	0	0	0
35	64	27	88	99	79	88	72	77	63	72	55	66	47	60	41	54	29	38	22	35	17	29	13	23	7	16	0	0	0	0	0
36	65	17	97	87	88	73	79	64	74	58	65	51	61	45	56	30	38	26	36	21	31	14	24	10	18	6	0	0	0	0	0
37	66	28	85	93	76	82	65	77	61	69	51	64	45	58	32	43	26	39	20	34	16	27	11	21	6	15	0	0	0	0	0
37	67	14	92	93	77	83	68	78	64	69	54	65	49	59	35	43	29	41	24	34	19	28	13	22	8	17	6	0	0	0	0
38	68	23	99	79	87	68	81	65	74	56	68	49	62	36	47	31	43	25	37	19	32	13	25	9	19	6	0	0	0	0	0
38	69	18	99	82	88	74	81	66	73	59	68	52	63	39	48	34	43	29	37	22	32	17	26	11	19	6	0	0	0	0	0
39	70	27	84	92	74	84	68	79	60	72	53	66	40	52	35	46	29	40	22	35	17	31	11	24	6	15	0	0	0	0	0
40	71	19	93	78	84	71	79	64	71	58	66	43	52	38	47	32	39	25	35	20	29	15	23	8	17	6	0	0	0	0	0
40	72	26	97	79	87	72	83	64	77	58	70	44	55	39	50	32	43	26	37	20	32	15	27	8	20	6	13	0	0	0	0
41	73	18	82	87	75	83	69	77	61	71	47	55	42	50	35	43	29	37	23	32	18	27	12	21	7	16	6	0	0	0	0
42	74	29	91	76	85	72	80	62	74	48	57	42	52	35	46	29	41	23	35	17	31	11	25	7	19	6	0	0	0	0	0
42	75	20	91	80	86	74	80	67	75	50	58	45	53	38	47	32	41	27	35	21	31	14	25	10	20	6	15	0	0	0	0
43	76	33	81	89	76	84	68	78	51	60	45	55	38	50	32	44	27	38	20	34	15	28	9	23	6	19	6	0	0	0	0
44	77	22	89	79	85	72	78	54	61	47	56	41	50	35	45	30	38	23	34	19	27	15	22	9	18	6	0	0	0	0	0
45	78	35	80	88	73	82	55	62	48	58	41	52	35	47	30	41	23	37	18	32	13	27	8	24	6	12	0	0	0	0	0
46	79	25	88	79	81	57	63	50	58	44	53	38	47	33	42	27	36	23	31	16	26	12	23	6	17	6	0	0	0	0	0
46	80	34	93	78	86	58	65	52	60	45	55	38	50	33	45	28	39	22	34	16	30	12	25	7	19	6	0	0	0	0	0
46	81	23	93	84	88	60	65	54	60	47	55	41	50	36	45	31	39	27	33	20	28	15	25	9	20	6	12	0	0	0	0
46	82	32	97	83	93	61	67	54	62	48	57	42	52	37	47	32	42	26	37	19	32	15	27	10	24	6	16	6	0	0	0
47	83	11	86	94	65	67	57	63	50	59	45	54	39	49	34	44	29	38	22	33	17	28	13	22	7	18	6	0	0	0	0
47	84	20	87	95	63	73	59	67	51	62	46	56	40	51	34	46	29	41	22	36	17	31	13	26	8	22	6	13	0	0	0
48	85	13	95	70	73	63	66	55	62	49	56	43	51	37	47	32	41	26	35	20	31	15	27	11	21	6	17	6	0	0	0
48	86	19	98	68	78	63	70	56	66	50	60	43	55	38	49	32	44	25	40	20	35	16	30	11	24	7	20	6	9	0	0
49	87	12	74	78	66	70	60	66	53	60	46	55	41	49	35	44	29	39	23	35	19	29	14	24	10	18	6	12	6	0	0
50	88	19	83	67	74	60	70	54	62	47	58	41	53	35	48	29	43	24	38	18	33	14	27	9	22	6	16	6	6	0	0
51	89	16	70	73	63	70	57	63	50	58	44	53	39	48	33	42	27	37	22	32	18	26	13	22	9	15	6	8	0	0	0
51	90	23	70	78	63	74	58	67	51	62	46	55	40	50	34	44	28	40	22	35	18	29	12	25	7	20	6	11	6	0	0
52	91	18	77	67	74	61	67	56	62	49	55	43	50	37	44	30	39	25	34	21	29	15	24	10	19	6	13	6	6	0	0
53	92	26	66	80	63	69	58	66	51	57	44	52	38	46	31	41	25	37	21	32	16	26	10	22	6	15	6	7	0	0	0
53	93	16	69	81	67	72	60	67	54	57	47	52	40	46	33	41	28	36	23	32	18	26	14	20	8	16	6	9	0	0	0
54	94	26	84	68	74	61	70	55	61	48	54	41	48	34	43	28	39	23	34	18	29	13	24	7	19	6	11	0	0	0	0
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54	96	25	87	71	79	64	73	58	63	52	58	45	52	38	45	32	40	26	36	20	32	15	26	10	21	6	16	6	6	0	0
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61	103	21	63	70	57	64	51	56	46	49	37	42	31	39	26	34	21	28	15	24	11	19	6	0	0	0	0	0	0	0	0
62	104	29	72	58	67	52	58	46	51	38	45	32	41	27	36	21	30	16	27	12	20	6	13	0	0	0	0	0	0	0	0
63	105	22	61	68	55	60	49	52	41	45	35	41	29	35	23	30	18	25	15	20	6	17	0	0	0	0	0	0	0	0	0
64	106	30	70	55	63	50	54	42	48	37	44	31	37	24	32	18	30	15	23	6	18	0	0	0	0	0	0	0	0	0	0
65	107	24	57	65	52	56	44	48	39	44	33	38	26	32	21	28	17	24	10	16	0	0	0	0	0	0	0	0	0	0	0
66	108	30	68	53	60	44	52	40	47	35	39	27	34	22	33	18	25	9	20	6	0	0	0	0	0	0	0	0	0	0	0
67	109	25	55	60	49	52	42	47	36	40	28	34	24	33	19	26	12	20	9	14	0	0	0	0	0	0	0	0	0	0	0
68	110	31	63	50	55	44	50	38	43	30	38	25	36	20	28	12	22	7	18	0	0	0	0	0	0	0	0	0	0	0	0
69	111	26	53	55	45	51	40	44	32	38	28	35	22	28	14	21	9	19	0	0	0	0	0	0	0	0	0	0	0	0	0
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70	113	28	58	49	55	43	48	36	42	32	38	25	31	17	23	12	20	7	0	0	0	0	0	0	0	0	0	0	0	0	0
71	114	35	50	58	44	52	37	45	32	41	26	33	17	25	12	22	7	17	0	0	0	0	0	0	0	0	0	0	0	0	0
71	115	26	52	57	48	52	39	46	36	41	29	33	19	25	14	21	9	18	0	0	0	0	0	0	0	0	0	0	0	0	0
71	116	34	53	61	48	56	40	49	36	44	29	35	19	27	15	23	9	20	0	0	0	0	0	0	0	0	0	0	0	0	0
72	117	28	61	51	57	43	49	39	45	31	36	22	27	16	24	11	20	6	0	0	0	0	0	0	0	0	0	0	0	0	0

73	118	37	51	59	44	53	40	47	32	38	22	29	17	25	12	21	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0
74	119	30	59	46	53	43	48	34	38	23	29	18	25	13	22	9	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0
75	120	37	48	57	43	50	35	41	24	30	19	27	14	23	9	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
76	121	32	56	47	50	39	41	26	31	20	27	16	23	10	20	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
76	122	37	60	47	53	39	44	26	32	21	28	16	25	11	21	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
77	123	30	51	52	43	45	28	32	23	29	18	25	13	22	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
77	124	39	51	56	43	48	28	34	23	30	18	26	14	23	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
78	125	32	56	48	49	28	34	24	30	20	27	15	24	11	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
78	126	34	60	48	52	29	35	25	32	20	28	16	25	11	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
79	127	19	51	52	33	35	27	32	22	29	18	26	13	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
79	128	28	51	54	32	40	27	36	23	32	19	28	15	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
79	129	19	53	54	35	40	30	36	25	32	21	28	16	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
79	130	28	53	56	35	44	30	40	26	35	21	31	17	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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81	132	29	38	47	34	43	29	39	25	33	20	29	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81	133	20	40	48	36	44	33	40	28	33	24	29	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
82	134	29	50	37	47	33	42	29	36	24	32	20	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
82	135	21	51	39	47	38	43	32	37	28	32	23	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
83	136	31	40	50	37	45	33	39	28	35	23	31	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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84	138	31	53	40	49	36	43	31	38	26	33	22	29	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85	139	23	43	49	38	44	34	39	29	33	24	30	18	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85	140	33	43	52	38	47	34	41	30	35	25	30	20	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85	141	22	46	52	41	48	36	42	31	36	26	31	21	27	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85	142	32	45	55	40	50	37	44	32	38	28	33	21	28	16	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85	143	22	48	54	44	50	39	45	34	39	30	33	24	28	18	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
86	144	30	57	43	52	39	47	35	41	30	35	24	30	18	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
86	145	23	56	46	52	42	47	37	42	32	36	26	30	20	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
87	146	32	45	55	41	50	37	43	33	38	27	33	21	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
88	147	25	55	45	49	38	44	34	39	29	33	23	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
89	148	32	44	51	39	45	34	41	30	35	23	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90	149	26	51	41	46	36	42	32	36	25	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
91	150	32	41	48	36	44	32	38	27	32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
92	151	27	48	38	45	34	39	29	33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
93	152	33	38	46	35	41	30	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
93	153	26	39	47	36	41	31	37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
94	154	31	48	36	43	32	38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
95	155	25	38	44	33	38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
95	156	32	38	46	33	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
96	157	26	45	35	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
97	158	33	35	42	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
98	159	27	42	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

The coloring of the cells of the transformed cloud VA is similar to the coloring of the cells of the transformed HA cloud, incl. yellow "non-standard" horizontal series of isotopes, the origin of which in the initial cloud falls on a series with an even number of protons (and accordingly the local maximum in these ranks falls on the third rank of transformed cloud).

To model the theoretical "key" VA, we have chosen the following approximating functions, see Fig. 8_16.

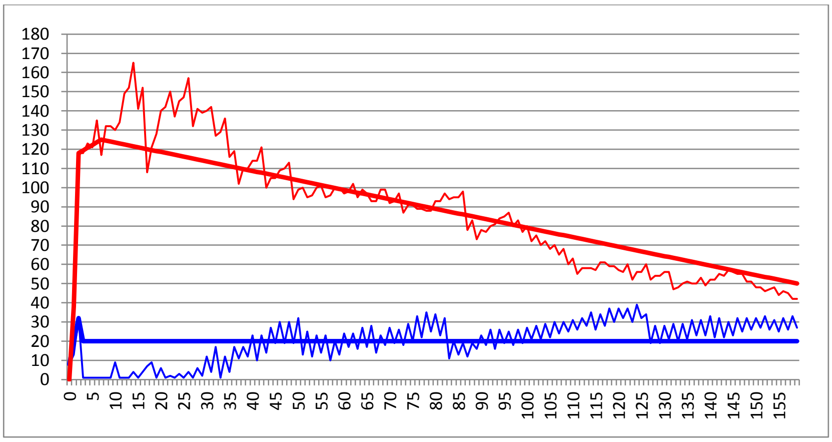


Fig. 8_16. Approximating functions of the parameters N and Max (M2 and M3) for constructing the theoretical key of the "Vertical Algorithm"

In the "Vertical Algorithm, the scanning of the proton isotope ranks proceeds along the neutron axis and the first neutrons of the vertical isotope groups enter the "clamps", therefore, in the first vertical series of the transformed cloud, the parameter P for HA becomes the parameter N for BA.
The parameter Max is equal to the maximum value of the number of bursted mu-neutrinos in the second and third vertical ranks of the transformed cloud (for standard and nonstandard isotope rank).
In the table form, the approximating functions N (TK-BA) and Max (TK-BA) can be written as:

n	0	1	2	3	7	--->	159
N(TK-BA)	8	20	32	20	--->	--->	20
Max(TK-BA)	0	38	118	--->	125	--->	50

It should be noted that on the graph of the function N (TK-VA), the same "ravines" are clearly visible in the coordinates N = 51, 83, 127, as in the HA. Taking into account that the simulation of the "T-key" for VA is carried out in the "accelerated" mode, we do not take into account the "ravines" and "deflections" of the "ladders", setting the coefficients Krav = 1 and Kdef = 0.
Next, we select the approximating functions for the parameters h1 and h2 (steps "ladder" down and up). Here we also introduced "modernization". Earlier, we already pointed out that to describe "ladders" (without taking into account "ravines" and "deflections") it is enough to specify any three parameters from the group of parameters M, Lo, h1, h2. In HA we seted the approximating functions of the parameters M, Lo and h1, and the parameter h2 was calculated.
Now, for the construction of a "T-key" for VA, we define approximating functions for the parameters M, h1 and h2, and the Lo parameter will be calculated.
Below in Fig. 8_17 and 8_18 presents the process of selecting the approximating functions for the parameters h1 and h2. We remind you that the initial graphs of the parameters h1 and h2 are constructed from the values of these parameters in the "ladders" VA, which follow directly behind the maximum values (Max).

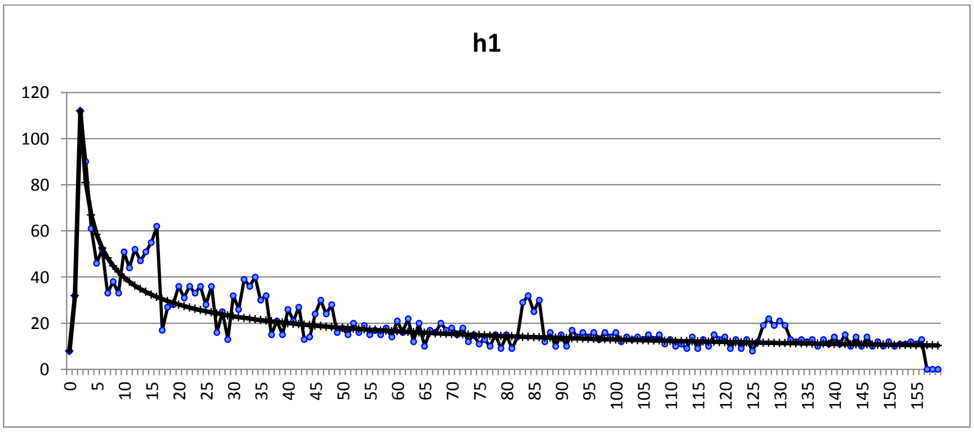


Fig. 8_17. The approximating function of the parameter h1 for the construction theoretical key of the "Vertical Algorithm"

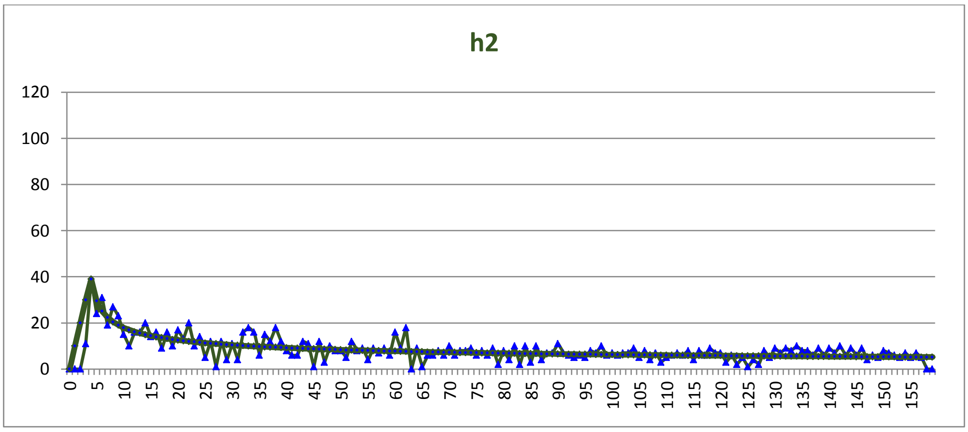


Fig. 8_18 Approximating function of parameter h2 for construction theoretical key of the "Vertical Algorithm"

In the table-algebraic form, the approximating functions h1 and h2 can be written as:

n	0	1	2	3	4	...	159
h1(ТК-ВА)	8	32	112	$112 \cdot (N_i - 1)^{-0,47}$			
h2(ТК-ВА)	0	10	20	30	39	$394 \cdot (N_i - 3)^{-0,4}$	

Further calculation of the theoretical "key" for the "Vertical Algorithm" in the form of a transformed cloud of isotopes was carried out according to the following simplified formulas, without taking into account "ravines" and "deflection":

the first vertical graph of isotopes (p * = 1, all elements)	$X_1 = N$
the second vertical graph of isotopes (p * = 2, standard elements)	$X_2 = Max$
the second vertical graph of isotopes (p * = 2, non-standard (yellow) elements)	$X_2 = Max - h2$
the subsequent vertical graphs of isotopes (p *> 2, A * -are, standard elements)	$Xi = X_{i-1} + h2$
the subsequent vertical graphs of isotopes (p *> 2, A * are odd, standard elements)	$Xi = X_{i-1} - h1$
the third vertical isotope graph of isotopes (p * = 3, non-standard elements)	$X_3 = Max$
the subsequent vertical graphs of isotopes (p *> 3, A * -are non-standard elements)	$Xi = X_{i-1} - h1$
the subsequent vertical graphs of isotopes (p *> 3, A * - odd, non-standard elements)	$Xi = X_{i-1} + h2$

The resulting theoretical "key" for VA looks like the following (Fig. 8_19) and gives the following results based on the graph of the binding energy of main-stream isotopes (Figure 8_20) and "rooks" for the isotope cloud (Fig. 8_21).

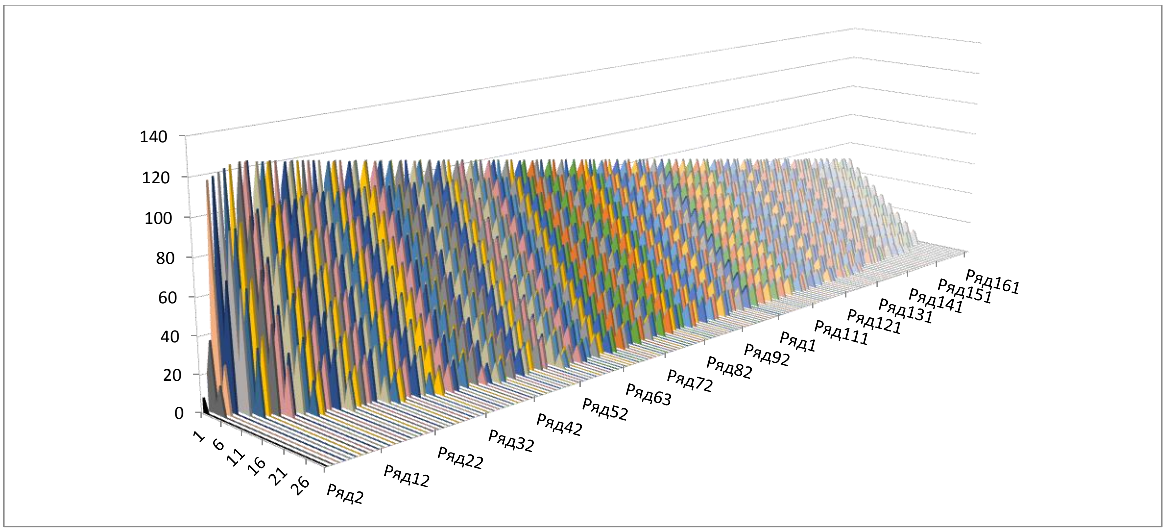


Fig. 8_19. The theoretical key for the "Vertical Algorithm" in the form of a transformed cloud

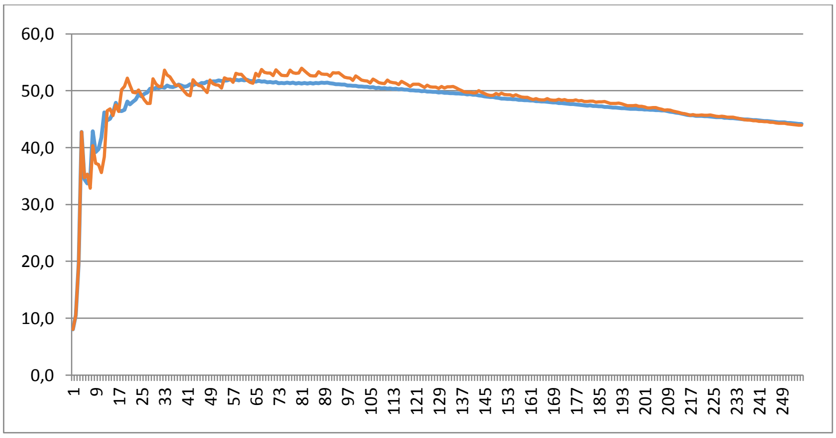


Fig. 8_20. Communications Energy Schedule for the "Vertical Algorithm" (thin red line)

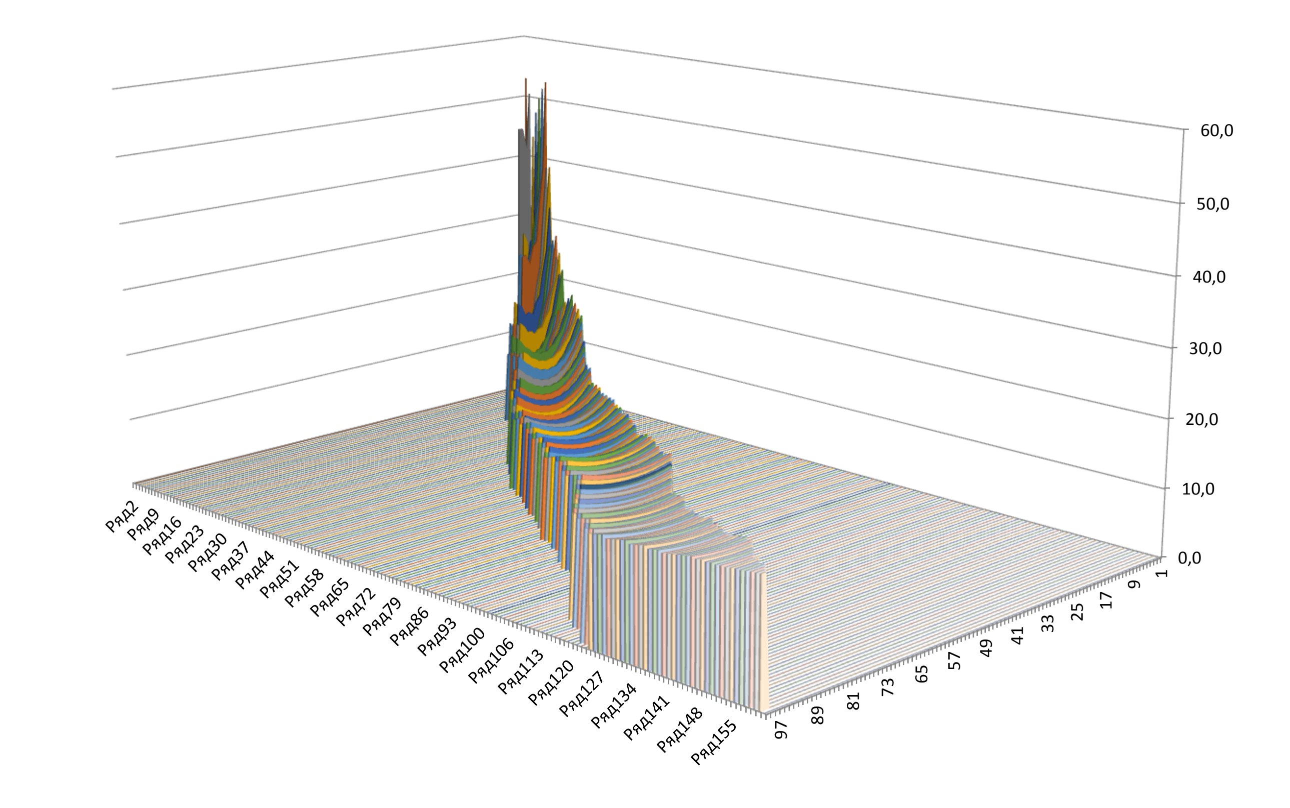


Fig. 8_21. "Rook" for "Vertical Algorithm"

To compare the obtained "rook" _BA, we also give its graph of minimum values in series along the axis OZ and a similar graph for the required "rook" _EK, see Fig. 8_22.

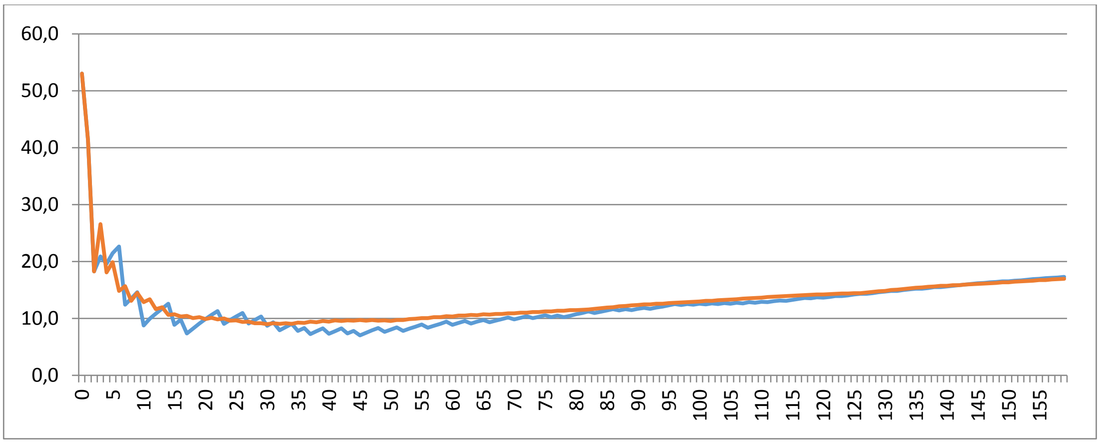


Fig. 8_22. Minima in the rows of the EK and TK for VA clouds along the OZ axis

The above graphs are very similar to the inverted graphs of the binding energy of the main-strem, but they have a completely different dimension along the horizontal axis (from 0 to 159 neutrons, not 256 isotopes, as in main-strem). Yes, and the selection of isotopes for these graphs does not always coincide with the main-strem.

As you can see, the results of the construction of the "T-key" for the VA in something turned out worse, and in something even better than the "T-key" for the HA.

As a result, we obtained two independent theoretical algorithms, claiming to "control" the process of nr_nucleosynthesis of the isotope cloud.

Which of them is true?

Both are true!

Instead of concluding Chapter 8

From the analysis of the processes of formation of the cloud of isotopes according to the "Vertical Algorithm" and the "Horizontal Algorithm", it can be concluded that the real process of formation of the isotope cloud was take place likely for both algorithms at the same time.

The mixed algorithm for the process of nr_nucleosynthesis was called the "Fan Algorithm". We will have to disassemble it as well. Without this, we can not draw definitive conclusions about the order of formation of the cloud of isotopes and the CODE, which "controlled" this process.

Chapter 9. "Fan algorithm" for the formation of an isotope cloud

In Fig. 9_1 is a diagram of the "Fan Algorithm" for the formation of an isotope cloud.

	N	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Эл	Z																	
H	1	1H	2H	3H	4H	5H	6H	7H										
He	2		3He	4He	5He	6He	7He	8He	9He	10He								
Li	3		4Li	5Li	6Li	7Li	8Li	9Li	10Li	11Li	12Li							
Be	4		5Be	6Be	7Be	8Be	9Be	10Be	11Be	12Be	13Be	14Be	15Be	16Be				
B	5		6B	7B	8B	9B	10B	11B	12B	13B	14B	15B	16B	17B	18B	19B		
C	6			8C	9C	10C	11C	12C	13C	14C	15C	16C	17C	18C	19C	20C	21C	22C
N	7				10N	11N	12N	13N	14N	15N	16N	17N	18N	19N	20N	21N	22N	23N
O	8					12O	13O	14O	15O	16O	17O	18O	19O	20O	21O	22O	23O	24O
F	9						14F	15F	16F	17F	18F	19F	20F	21F	22F	23F	24F	25F
Ne	10							16Ne	17Ne	18Ne	19Ne	20Ne	21Ne	22Ne	23Ne	24Ne	25Ne	26Ne
Na	11								18Na	19Na	20Na	21Na	22Na	23Na	24Na	25Na	26Na	27Na
Mg	12								19Mg	20Mg	21Mg	22Mg	23Mg	24Mg	25Mg	26Mg	27Mg	28Mg
Al	13									21Al	22Al	23Al	24Al	25Al	26Al	27Al	28Al	29Al
Si	14									22Si	23Si	24Si	25Si	26Si	27Si	28Si	29Si	30Si
P	15										24P	25P	26P	27P	28P	29P	30P	31P
S	16											26S	27S	28S	29S	30S	31S	32S
Cl	17												28Cl	29Cl	30Cl	31Cl	32Cl	33Cl
Ar	18													30Ar	31Ar	32Ar	33Ar	34Ar
K	19														32K	33K	34K	35K
Ca	20															34Ca	35Ca	36Ca
Sc	21																36Sc	37Sc
Ti	22																	38Ti

Fig. 9_1. "Fan algorithm" for the formation of an isotope cloud

According to this algorithm, each isotope of the cloud, with the exception of the isotopes bordering the cloud from all sides (in the figure they are filled with blue and green colors), could be formed in two ways - according to the "Horizontal" or "Vertical" algorithms, as shown by the corresponding arrows in the figure.
Let us explain the coloring of isotopes. The blue isotopes are formed according by the scheme of transformation of a relic neutron into a proton, the green isotopes according by the scheme of transformation of a relic neutron into a neutron, all the other isotopes (yellow ones) can be formed in two ways, by the one and the other scheme.
The "fan" algorithm assumes the formation of all isotopes (with the exception of "blue" and "green" according to the two schemes, but taking into account that the previous isotopes could have formed, in general, also according to two schemes, a very large number of ways of formation of each isotope It is not possible to calculate all these paths for all isotopes for us, although we have already calculated and analyzed one possible "path" of the fan algorithm (main-stream).

"Integral" CODE of isotope formation in the Universe

In constructing the theoretical "key" for the formation of an isotope cloud for the "Horizontal Algorithm," we have revealed a number of regularities in this process. Madeing formalizing these regularities, we were able to construct a variant of the theoretical "key" that is simulate the process of nr_ nucleosynthesis of isotopes quite well.

But, in the process of constructing the "T-key_HA", we were faced with the prerequisites for the existence of a "vertical algorithm" for the formation of an isotope cloud, the calculation of which showed that the number of bursting mu-neutrinos per step of nr_nucleosynthesis in the formation of the same isotope by different algorithms is different. Incline of "ladders" they go on different axes. At the same time, the total number of bursting mu-neutrinos in the formation of the same isotope by different algorithms practically coincide.

This "difference-similarity" we called the orthogonal symmetry of HA and BA. It is not difficult to understand that the orthogonal symmetry is based on the similarity (symmetry) of S_models of the proton and neutron , or more precisely, on the symmetry of two, the only possible, options for constructing their "quark hoops": u-u-d and u-d-d.

Simultaneous existence of two algorithms for the formation of each isotope destroys our idea - to find a single algorithm (CODE, "key"), which allows calculating the number of bursting mu-neutrinos at the formation of each isotope. The number of bursting mu-neutrinos at each step of nr_nucleosynthesis for different algorithms differ by and depends on the scheme of formation of this isotope. However, for a single isotope of these schemes only two - horizontally or vertically.

Those. it turns out that each already formed isotope are have ready two sets of parameters (P, M, h1, h2) for HA and (N, M, h1, h2) for BA, "cooked" for the formation of the next isotope. And depending at by which option the next isotope will be formed, one or another set of parameters is used.

Conversely, each newly will be formed isotope can be formed from two different precursor isotopes by two different algorithms, wherein a different number of mu-neutrinos will bursted, but the total number of mu-neutrinos remaining in the isotope will coincide. Accordingly, the masses of these isotopes will coincide, in spite of the fact that they were formed according to different algorithms.

This "integral" scheme contains some "artificial" unformalized information parameter that determines the scheme for the formation of the next isotope in each specific case.

In fact, everything is "easier", the process of selecting a "set of parameters" is based not on the information, but on the physical level as follows:

A) Firstly, everything depends on the nucleon in which the relic neutron is transformed - into a proton, or a neutron. This depends on how the mu-neutrino bursts "far" from the "quark hoop" and whether the destruction and confinement of one of the quarks d occurs (we do not consider the quark u disruption option as exotic). If the quark d is destroyed, a proton is formed, if not, a neutron is formed.

B) If the nucleon formed joins the nuclear nucleon of the same type (i.e., co-axially, the magnetic vectors of all three pairs of gap magnets of the conjugating nucleons coincide), then the number of bursting mu-neutrinos is determined by the regularity of "wave-like mountains " and depends on: the first - the kind of nucleons (for neutrons, the process proceeds according to the set of parameters of the HA, and for protons, the process proceeds according to the set of parameters VA), the second one - the even or odd number of the joining nucleon in a series of identical nucleons, counting from the beginning of the "sausage" of the nucleus and a third - a amount of bursting mu-neutrino is determined of parameters corresponding algorithm (GA or BA), depending on the parameters N and Z produced isotope.

B) If the nucleon formed joins the nucleon of the opposite kind and the first "sponge of clamps " is formed, then non-coaxial weak coupling is created (only by two pairs of magnetic "latches" and the number of bursting mu-neutrinos can not be large). The type of mating neutrons automatically determines the type of the join algorithm (HA or VA), and the specific number of mu-neutrino bursts is determined by the parameters of the corresponding algorithm, depending on the parameters Z and N of the isotope formed.

D) If the nucleon formed joins the nucleon of the opposite kind (non-coaxial) and a second "sponge of mites" is formed, then an additional strong coupling arises and the number of bursting mu-neutrinos increases sharply. The type of conjugating nucleons automatically determines the form of the joining algorithm (HA or VA), and the specific number of bursting mu-neutrinos is determined by the parameters of the corresponding algorithm (HA or VA), depending on the parameters Z and N of the isotope formed.

Such a scheme gives an unambiguous result of the number of bursting mu-neutrinos, "involves" both algorithms (HA and VA), and takes into account all the regularities observed by us, including the parity-oddness of the joining nucleon, taking into account its kind .

Moreover, this isotope formation scheme allows the next joining nucleon to jump into another formation algorithm, in comparison with the algorithm of formation of the previous isotope (ie use the "Fan algorithm.") In this case, no special "integral" theoretical "key" is not necessary to build, because at the level of the total number of mu-neutrinos that burst or remain in the isotope (ie, the mass of the isotope), the calculation results for the "Horizontal Algorithm" and the "Vertical Algorithm" are matching.

Those. estimated calculations of the mass of specific reference isotopes (which can not be measured experimentally because of their very short lifetime) can be carried out by any algorithm (HA or VA), starting from known and verified masses of the preceding isotopes.

The relevance of the proposed formulas of theoretical "keys" for HA and VA increases sharply when there is a need to predict the masses of new isotopes that are absent in the reference isotope cloud. And for this, both models - both HA and VA - are needed. According to HA, we can calculate the masses of new isotopes located outside the standard isotope cloud along the neutron axis, and for VA one can calculate the masses of new isotopes located outside the standard isotope cloud along the proton axis.

Below we will present the maximally complete theoretical size of the isotope cloud and calculate the mass of several new isotopes.

"Complete" theoretical isotope cloud according to S_theory

Let us return once again to the "green" and "blue" isotopes bordering the reference cloud of isotopes (Figure 9_1) "Green" coloring of isotopes to some extent can be considered conditional. We wrote about this in detail, analyzing the "Horizontal Algorithm" for the formation of a cloud of isotopes. In the same place, we calculated the new theoretical boundary of the cloud of isotopes Lo (HA). In a cell in front of a given boundary, the number of mu-neutrinos that have bursted must be at least one, and this is the theoretical last isotope of the chemical element. In the next cell, X = 0, which means that the relic neutron can no longer join, the energy of the gluon flagellum emerging from the isotope core is not enough to capture the relic neutron. In Fig. 7_37 and 7_38 visually present the theoretical extension of the isotope cloud in the framework of the "Horizontal Algorithm" along the neutron axis.

A similar theoretical possibility of expanding the isotope cloud within the "Vertical Algorithm" along the proton axis also applies to "blue" isotopes, in which the number of burst mu-neutrinos is greater than 6, see Fig. 9_2, the line Lk (EC). Having extrapolated the "ladders" of the "Vertical Algorithm" to zero level, we resulted in calculation of the theoretical cloud boundary, see Fig. 9_2, line Lo (VA).

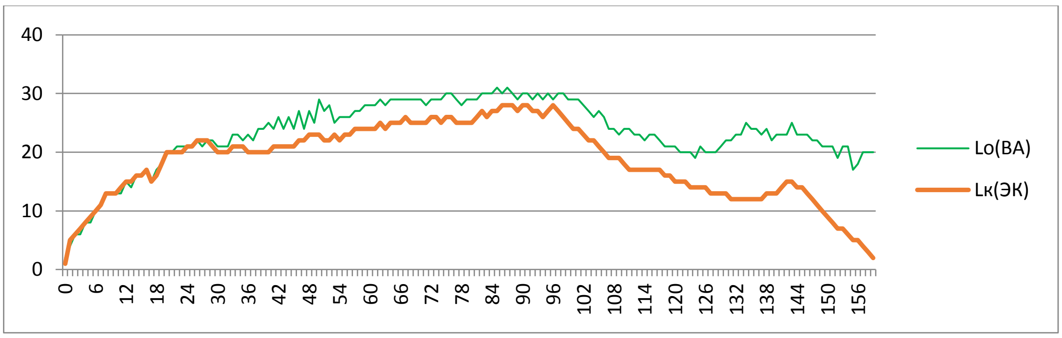


Fig. 9_2. The graphs of the parameters Lk (EC) and Lo_VA for the "Vertical Algorithm"

In comparison with the reference width of the initial cloud along the proton axis, the theoretical cloud width has increased.

Recalculating the obtained results in the initial view of the isotope cloud, we obtain the following form of the full theoretical isotope cloud in S_theory in the range from the 1st to the 100th elements (Fig. 9_3). The symbols UL and LL are the upper and lower boundaries of the cloud.

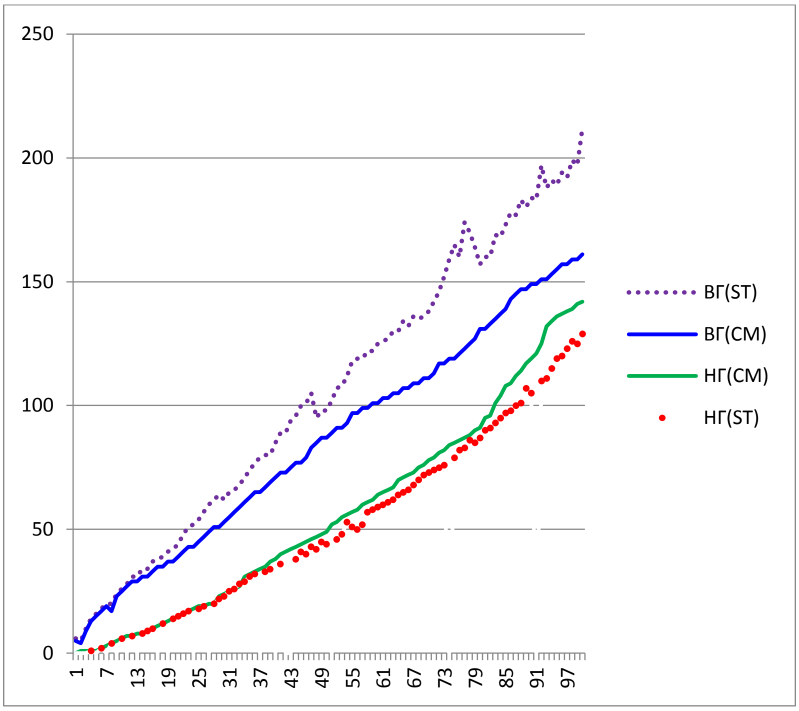


Fig. 9_3. The boundaries of the reference cloud of isotopes LL(SM)-UL(SM) and the theoretical cloud of isotopes of LL(ST)-UL(ST) by S_theory

As we see, the increase in the size of the theoretical isotope cloud along the neutron axis (up) and along the proton axis (down) is significantly different in magnitude. This difference indicates the possible priority of the "Horizontal Algorithm" at the formation of an isotope cloud over the "Vertical Algorithm".
We have already noted that the mathematical models of the CODE made by us make it possible to calculate the mass of potentially new isotopes located beyond the boundaries of the standard isotope cloud. Let's calculate the mass of two new isotopes.

Calculation of the mass of new isotopes 130Ag and 131Ag.

The reference rank of silver isotopes ends with the 129Ag isotope with a mass of 128.94369 amu.
According to the calculation we have done on the "T-key", in addition, theoretically, two more isotopes 130Ag and 131Ag can exist. At that, with the formation of the 130Ag isotope (containing 83 neutrons), one mu-neutrino burst, and with the formation of the 131Ag isotope (containing 84 neutrons), 10 mu-neutrinos burst.
Theoretically, the proposed masses of new isotopes should be equal to:
130Ag = 129Ag + nr - $\nu\mu$ = 128.94369 + 1.0088644 - 0.000199496 = 129.9523549
131Ag = 130Ag + nr - 10$\nu\mu$ = 129.9523549 + 1.0088644 - 10 * 0.000199496 = 130.9592244
Similarly, we can calculate the mass of all theoretically assumed new isotopes.

The Anthropic Side of the Material Considered

On this, we practically complete the S_modeling of the process of nr_nucleosynthesis of the isotope cloud and the consideration of the "tricky" (Anthropic) question - was there a CODE in the process of nr_nucleosynthesis.
Our work allows us to assert that the process of nr_nucleosynthesis was under the "control" of purely physical laws predetermined by the internal electromagnetic properties of protons and neutron.
In conclusion, we want to share two more aspects of the issues we have examined, which are preliminary (hypothetical) in nature and have not been reflected in the material presented.

"A bunch of keys" is one of the directions for improving the "T-key" model

We are talking about the following. The results of calculations based on models of theoretical "keys" that we compiled on the basis of averaged approximating parameters give a completely good enough coincidence with the experimental data recalculated in the number of bursting and remaining mu-neutrinos by one nucleon, such as the graph of the binding energy for main-stream and "rook" for the cloud of isotopes.
But if we look again at the three-dimensional graphs of the number of burst mu-neutrinos by one step of nr_nucleosynthesis for the experimental key (see Figures 7_14 - 7_18) and the theoretical keys (see Figures 7_49 and 8_19), it is impossible not to notice their significant difference. There is great doubt that the required experimental "hedgehog key" can in general be described by some "decent" theoretical function, even if it is ideal to model all the discovered (and not detected) regularities of the physical process of nr_nucleosynthesis.
The variant of solution of this dilemma can be the "standard" physico-mathematical approach of defragmenting a complex function at a set of simpler functions. At the same time, it must be borne in mind that this defragmentation must necessarily have some physical basis, allowing to split a complex function into simple ones. Applied to our problem, such a physical basis can be time, or rather the change in the values of the parameters, revealed by us regularities, in time.
In fact, the formation of the spectrum of isotopes went successively from lungs to heavy and took some time. At the same time, conditions, both external and internal, have changed.
Changes in external conditions include changes in the concentration of relic neutrons, temperature, pressure, etc. Internal conditions include the continuous growth of SGW.
Perhaps, under the influence of these changing conditions, the parameters of the algorithms HA and VA, which determine the number of bursting mu-neutrinos, were also corrected. In this case, the final experimental "key", the equivalence of which we want to achieve, is in fact not an independent function (the "key") but the final combination of work of the "a bunch of keys" .
In other words, from the mathematical point of view, in the "T-key" formula, the argument t (time) should additionally appear.
From the physical point of view, the argument t can be replaced by the parameter A (the number of nucleons in the nucleus), taking into account the complete correlation between these parameters.
Solving the problem in this perspective (distributed over time) requires additional theoretical studies.

Remark:
In the aggregate of all questions of S_theory, the question of constructing the CODE is only an "episode", our main task is to show the fundamental possibility of the formation and construction of our universe on the basis of electromagnetic simples. Ahead still us awaits not less interesting chapters devoted to modeling on the basis of S_theory of modern nuclear reactions, field theory, gravity, dark matter, dark energy, and an "exit" to the questions of modeling the structure of space and the multiplicity of universes.
At this concludes the search for a CODE (theoretical "key") for the formation of the isotope spectrum in the process of nr_nucleosynthesis. The answers to the questions posed, but not solved by us, remain for future research.
But before proceeding to the conclusion of Ch. 7, 8, 9 another aspect of the process of nr_nucleosynthesis, essentially affecting the methods used by us earlier in calculating the parameters of simples and building S_models.

Why are the results of nr_nucleosynthesis of the isotope cloud by the algorithms HA and VA a little different?

This aspect concerns the comparison of the results of calculating the process of nr_nucleosynthesis of an isotope cloud by HA and VA algorithms based on reference isotope masses (and not on the basis of T-key models).
Frankly speaking, we, according to inertia, could "skip" this comparison, taking into account the practical identity of the resulting graphs of the Communication Energy and the "rook" calculated and constructed using algorithms

HA and VA, which allowed us to say that the real process of nr_nucleosynthesis was on a single integrated "Fan Algorithm" (a mixture of steps in HA and VA).
However, let's compare the results of separate calculations for HA and VA once more.
Physically and methodically, the algorithms HA and VA are based on calculations of the number of bursting mu-neutrinos at each step of nr_nucleosynthesis along the horizontal or vertical sections of the isotope cloud.
We have already noted that the results of these calculations on the algorithms of HA and VA are orthogonally symmetric. Once again, we illustrate this with graphs (see Figure 9_4).

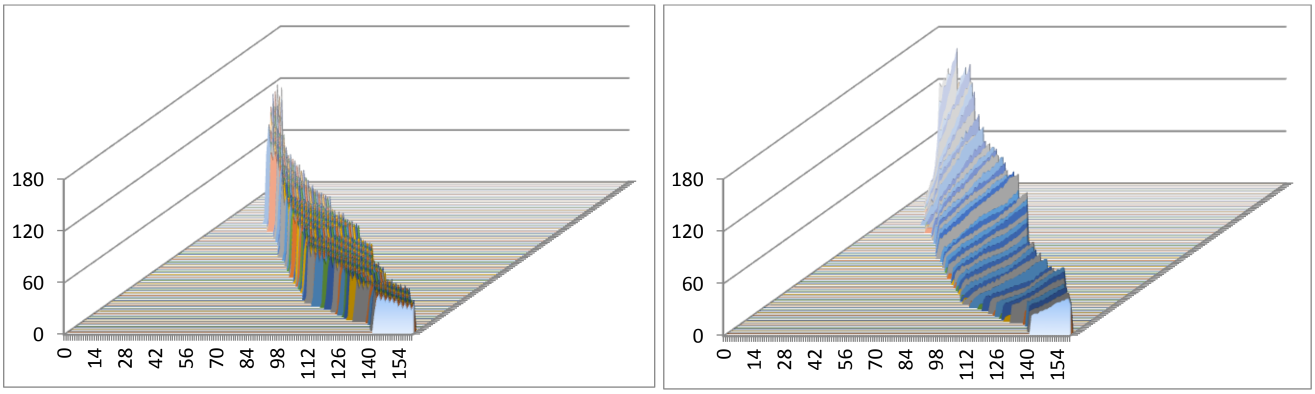


Fig. 9_4. Orthogonal symmetry of the number of bursting mu-neutrinos per step, calculated by the algorithms HA and VA

However, being "summarized" in the total number of burst mu-neutrinos in a particular isotope from the very beginning of the nr_nucleosynthesis process, the results of calculations for HA and VA yield the same "pictures" (see Fig. 9_5).

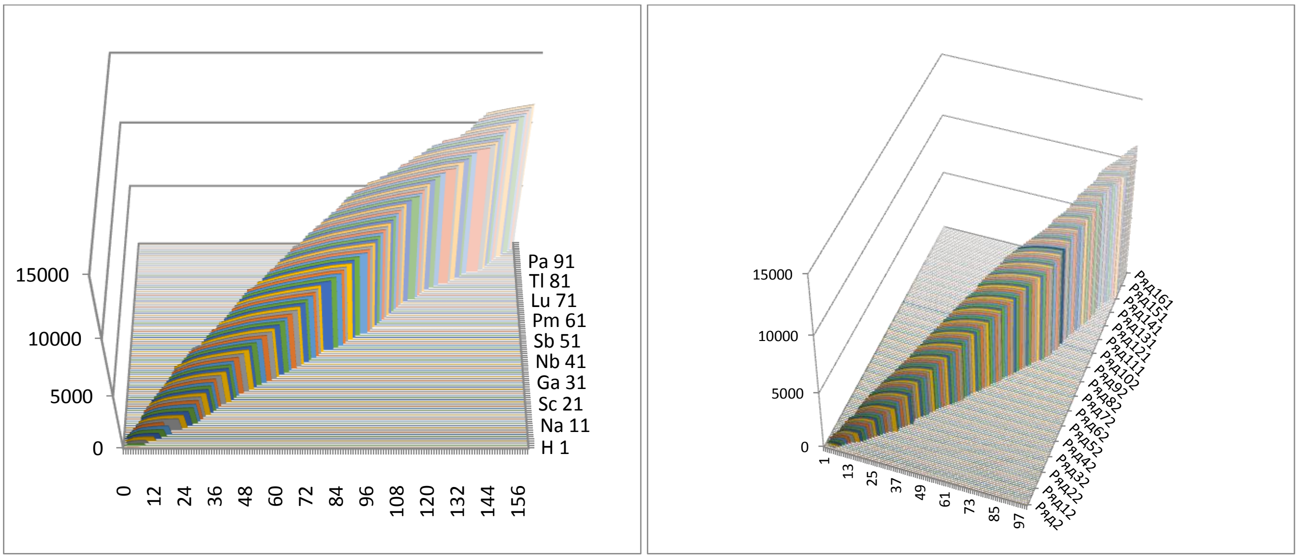


Fig. 9_5. The results of calculating the total number of burst mu-neutrinos from the beginning of the nr_nucleosynthesis process using the HA and VA algorithms

It is the equality of the data of the results (pictures) that leads to the equality of "rooks", calculated by the algorithms HA and VA (see Figures 9_6 and 9_7).

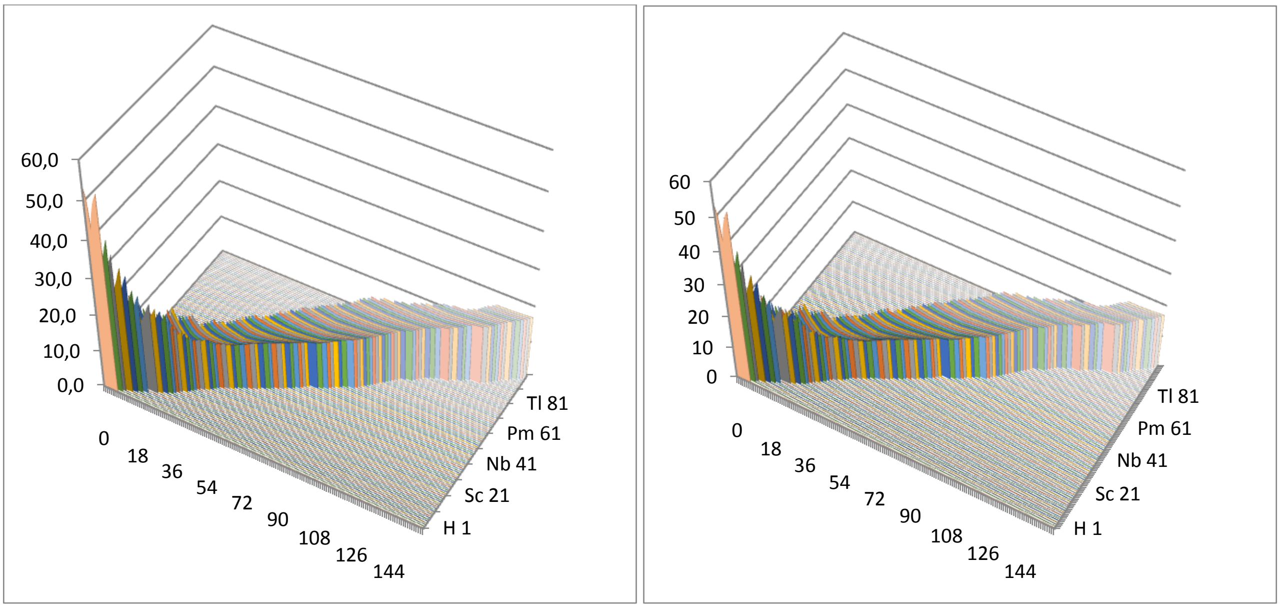


Fig. 9_6. "Rooks" for HA and VA (view from the left "board")

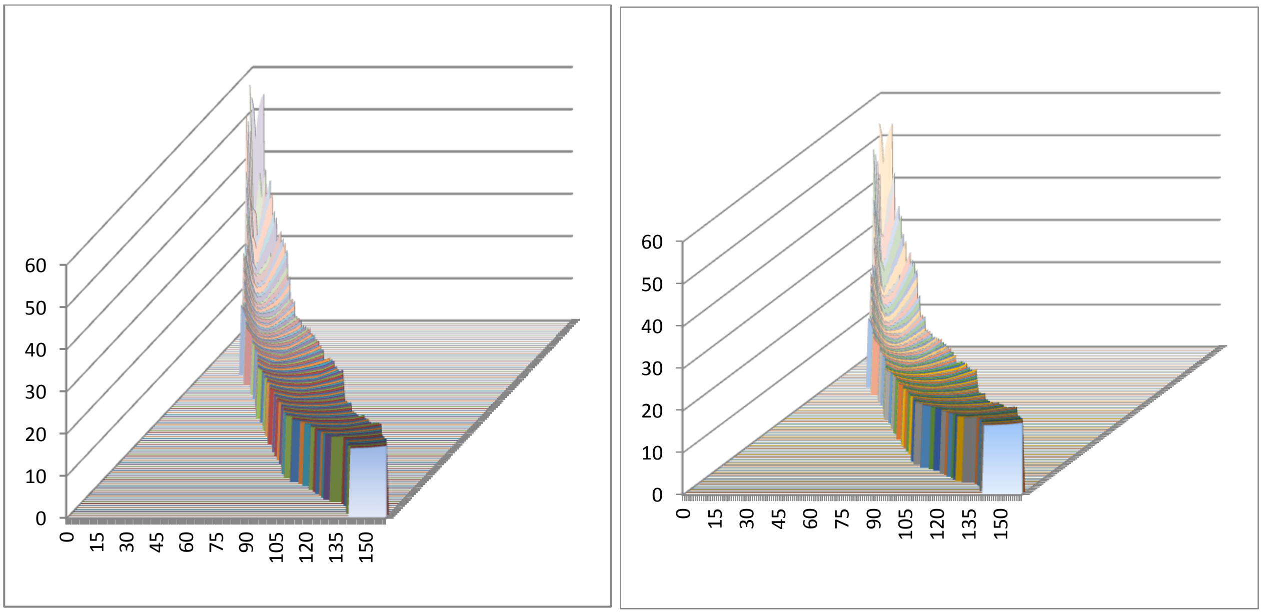


Fig. 9_7. "Rooks" for HA and VA (view from the "stern")

It turns out that the "key" of the process of isotope formation is the parameter (graphs) of the total number of burst mu-neutrinos in the isotope from the beginning of the process of nr_nucleosynthesis, which are identical for the algorithms HA and BA, despite the obviousdifference in the number of bursting mu-neutrinos at each step of nr_nucleosynthesis for these algorithms for HA and VA.
We again ask ourselves a question - how completely different graphs of the number of bursting mu-neutrinos per step of nr_nucleosynthesis in total give the same total number of burst mu-neutrinos from the beginning of the process of nr_nucleosynthesis for each isotope?
It is purely mathematically clear. Both here and there we do the calculate based on the same reference masses of isotopes. Here, only for different algorithms are different supporting isotopes-parents, having different masses. This means that the total mass difference (and the total difference in the total number of mu-neutrinos that burst or remain in the isotope) of any two isotopes must coincide.
We decided to check the results of calculating the total number of burst mu-neutrinos for the algorithms HA and VA in numbers.

Below are the diagrams of the initial part of the cloud that represent the total number of burst mu-neutrinos in each isotope for the algorithms HA and VA (Figures 9_8 and 9_9).

эл.	p\n	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
H	1	8	21	53	55	57	59	61																			
He	2		59	171	172	179	180	193	195	197																	
Li	3		66	178	201	241	253	276	277	280	281																
Be	4		73	185	241	344	354	392	396	415	416	425	426	427													
B	5		80	192	250	351	398	461	481	509	516	532	533	542	543	547											
C	6			198	265	381	453	555	583	628	636	660	665	689	694	711	712	716									
N	7				272	388	465	574	632	692	707	740	757	787	800	826	834	845	846	847							
O	8					394	481	607	680	766	790	835	858	900	922	960	976	997									
F	9						488	614	686	778	829	887	924	969	999	1041	1063	1088	1095	1104	1105	1111	1112	1114			
Ne	10							620	702	807	871	963	1001	1058	1087	1136	1160	1191	1200	1222	1230	1248	1251	1261	1262	1265	
Na	11								708	814	892	986	1047	1115	1154	1204	1236	1274	1295	1320	1334	1356	1366	1380	1383	1391	1392
Mg	12								714	836	917	1023	1095	1185	1226	1287	1323	1370	1391	1427	1441	1474	1487	1511	1516	1533	1536
Al	13									843	926	1032	1114	1207	1270	1342	1385	1437	1469	1509	1533	1564	1579	1609	1622	1645	1657
Si	14									853	943	1058	1140	1244	1317	1411	1458	1517	1554	1605	1631	1673	1688	1723	1736	1767	1780
P	15										949	1064	1149	1257	1337	1435	1497	1565	1609	1665	1700	1747	1767	1805	1827	1862	1881
S	16											1071	1161	1278	1362	1466	1538	1620	1668	1731	1770	1825	1850	1895	1920	1963	1987
Cl	17												1167	1284	1368	1475	1554	1640	1703	1773	1821	1878	1912	1957	1990	2034	2066
Ar	18													1290	1379	1497	1581	1674	1744	1828	1877	1942	1979	2034	2068	2120	2152
K	19														1386	1504	1588	1684	1763	1848	1914	1986	2029	2085	2127	2180	2221
Ca	20															1510	1601	1705	1786	1879	1952	2038	2085	2148	2192	2253	2294
Sc	21																1607	1711	1792	1885	1963	2052	2116	2183	2237	2299	2348
Ti	22																	1717	1802	1903	1985	2081	2149	2238	2291	2363	2412
V	23																		1808	1909	1991	2089	2167	2254	2327	2398	2456
Cr	24																			1918	2007	2113	2188	2289	2361	2450	2508
Mn	25																				2014	2120	2200	2298	2381	2471	2543
Fe	26																				2020	2132	2217	2324	2403	2501	2577
Co	27																					2138	2223	2330	2411	2510	2591
Ni	28																					2144	2229	2341	2427	2532	2613
Cu	29																		0						2433	2538	2619
Zn	30																									2544	2630
Ga	31																										2636

Fig. 9_8. The mu-neutrino bursted (for the "Horizontal Algorithm")

эл.	p\n	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
H	1	8	21	53	55	57	59	61																			
He	2		59	171	173	180	182	196	198	200																	
Li	3		66	177	201	242	255	279	281	285	286																
Be	4		73	183	240	343	354	393	398	417	418	427	428	429													
B	5		80	189	249	351	398	462	482	511	517	534	535	543	544	548											
C	6			195	264	381	453	556	585	632	639	664	669	692	696	713	714	718									
N	7				271	387	465	575	634	695	709	743	759	789	801	827	835	846	847	848							
O	8					393	482	608	682	769	792	837	859	902	922	961	976	998									
F	9						489	614	688	781	831	889	925	970	998	1041	1062	1088	1095	1104	1105	1111	1112	1114			
Ne	10							620	705	811	874	967	1003	1061	1088	1139	1162	1194	1203	1225	1233	1251	1254	1264	1265	1268	
Na	11								711	818	894	989	1048	1117	1153	1205	1235	1274	1294	1319	1333	1355	1365	1378	1380	1389	1390
Mg	12								717	841	920	1027	1097	1188	1226	1290	1324	1373	1394	1429	1443	1476	1489	1512	1517	1534	1537
Al	13									848	929	1036	1116	1209	1268	1343	1384	1438	1470	1509	1533	1565	1579	1608	1621	1643	1656
Si	14									858	947	1062	1143	1247	1317	1414	1459	1519	1556	1606	1631	1674	1688	1722	1735	1766	1780
P	15										953	1068	1152	1260	1337	1437	1498	1567	1611	1666	1701	1748	1767	1805	1827	1861	1882
S	16											1075	1164	1282	1363	1469	1540	1623	1671	1733	1772	1827	1850	1895	1920	1963	1988
Cl	17												1170	1288	1370	1479	1557	1644	1707	1776	1823	1881	1913	1959	1991	2035	2067
Ar	18													1294	1381	1501	1583	1678	1747	1830	1878	1945	1979	2035	2068	2121	2153
K	19														1388	1507	1589	1687	1764	1848	1914	1988	2028	2086	2126	2180	2221
Ca	20															1513	1603	1709	1789	1881	1954	2041	2084	2150	2192	2254	2296
Sc	21																1609	1715	1795	1887	1965	2055	2115	2185	2237	2300	2349
Ti	22																	1721	1805	1905	1987	2084	2148	2240	2291	2364	2414
V	23																		1811	1911	1994	2094	2168	2257	2328	2400	2459
Cr	24																			1920	2009	2117	2188	2292	2362	2452	2511
Mn	25																				2016	2123	2200	2301	2382	2472	2544
Fe	26																				2022	2135	2217	2327	2404	2503	2579
Co	27																					2141	2223	2333	2412	2512	2593
Ni	28																					2147	2229	2345	2429	2535	2616
Cu	29																		0						2435	2541	2622
Zn	30																									2547	2633
Ga	31																										2639

Fig. 9_9. The mu-neutrino bursted (for the "Vertical Algorithm")

As we "feared", starting with the 5He isotope, the total number of burst mu-neutrinos for HA (172 pcs.) And for VA (173 pcs.) begin to diverge. And there are quite a lot of such discrepancies in the entire cloud of isotopes (in the 2841 isotopes of 2970 or 95.7%). The range of differences between the total number of burst mu-neutrinos in

the same isotopes for different algorithms is from -25 pcs. up to +3 pcs. mu-neutrino, which, in terms of the reference isotope masses, ranges from -0.009% to + 0.0085%.
Small values of deviations refer to lighter isotopes at the beginning of the cloud. Large deviations refer to heavy isotopes at the end of the cloud.
This suggests that the deviations of the number of bursting mu-neutrinos for HA and VA algorithms accumulate as the isotope cloud forms.
We decided to test this by calculating the difference in the number of bursting mu-neutrinos in elementary cycles of nr_nucleosynthesis consisting of their four neighboring nucleons, along two possible paths for the formation of the resulting isotope (see Fig. 9_10). Yellow indicates the resultant isotope, blue denotes the initial isotope of the elementary cycle of nr_nucleosynthesis.

$$\begin{tikzcd}[column sep=huge, row sep=huge]
\boxed{m1} \arrow[r, "\begin{matrix}\Delta g21\\ \Delta N21\\ \Delta m21\\ (HA)\end{matrix}"] \arrow[d, "\begin{matrix}\Delta m31\\ \Delta N31\\ \Delta g31\end{matrix}\ (VA)"'] & \boxed{m2} \arrow[d, "(VA)\ \begin{matrix}\Delta m42\\ \Delta N42\\ \Delta g42\end{matrix}"] \\
\boxed{m3} \arrow[r, "\begin{matrix}(HA)\\ \Delta m43\\ \Delta N43\\ \Delta g43\end{matrix}"'] & \boxed{m4}
\end{tikzcd}$$

$$\Delta m21 + \Delta m42 = \Delta m31 + \Delta m43 = m4 - m1$$

$$(\Delta N21 + \Delta N42) \approx (\Delta N31 + \Delta N43)$$

$$\Delta g = \Delta N^{*}\nu\mu - \Delta m,\ \text{или}\ \Delta m = \Delta N^{*}\nu\mu - \Delta g$$

Fig. 9_10. Elementary cycle of nr_nucleosynthesis from the four neighboring nucleons

We perform a demonstration calculation of the elementary cycle for the resulting isotope 221Rn (see Fig. 9_11).

$$\begin{tikzcd}[column sep=huge, row sep=huge]
\boxed{210At} \arrow[r, "\begin{matrix}\Delta N{=}43\\ (ГА)\end{matrix}"] \arrow[d, "\Delta N{=}30\ (ВА)"'] & \boxed{211At} \arrow[d, "(ВА)\ \Delta N{=}32"] \\
\boxed{211Rn} \arrow[r, "\begin{matrix}(ГА)\\ \Delta N{=}44\end{matrix}"'] & \boxed{212Rn}
\end{tikzcd}$$

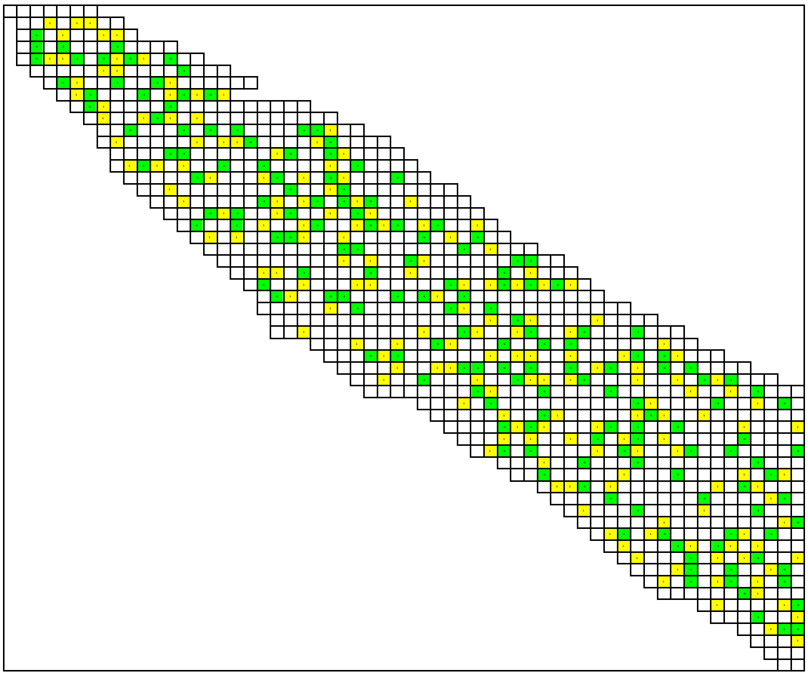
Fig. 9_11. The elementary cycle of nr_nucleosynthesis for the isotope 212Rn

The total difference in the number of bursting mu-neutrinos along two paths of the elementary isotope formation cycle 212Rn is (43 + 32) - (30 + 44) = 1 pc. mu neutrinos.
According to this algorithm, we have calculated all the elementary cycles (EC) for all isotopes of the cloud, which can be formed in two ways. The results of calculations showed that in most elementary cycles (1792 out of 2708 or 66.2%), the number of bursting mu-neutrinos along the different paths coincides. In 469 EC (17.3%), the number of bursting mu neutrinos along the first path (HA + VA) per 1 pc. mu-neutrinos is larger than the number

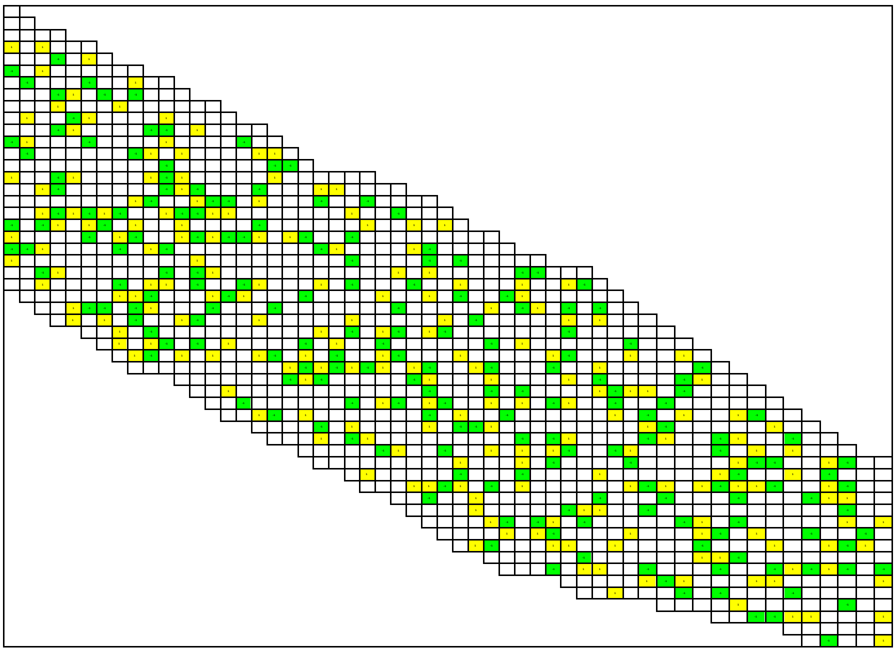
of bursting mu-neutrinos along the second path (VA + HA). And in 447 EC (16.5%) the number of bursting mu-neutrinos along the first path (HA + VA) per 1 pc. mu-neutrinos is smaller than the number of bursting mu neutrinos along the second path (VA + HA).

What is even more interesting, the EC distribution, with a non-zero difference ΔN for the first and second paths, is absolutely uniformly in the area of the isotope cloud, see Fig. 9_12.

Part 1



Part 2



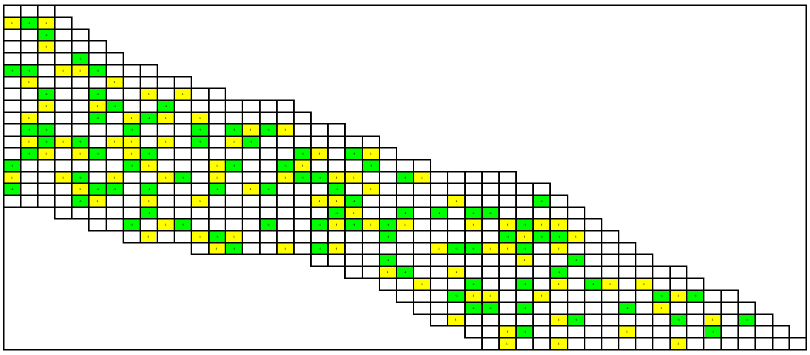


Fig. 9_12. Cloud diagram of the deviation of the number of bursting mu-neutrino in elementary fan-cycles (four-nucleons) by two ways of forming the resulting isotope. Yellow (+1) - 469 cycles. Green (-1) - 447 cycles. White (0) - 1792 cycles.

Why do different ways in the EC sometimes give a different total number of bursting mu-neutrinos? After all, the reference masses of all isotopes in both cases are absolutely equal (!). This means that the total mass defects along the first and second paths are equal.

The whole point is that only a whole number of mu neutrinos can burst, having a well-defined, far from zero mass. This leads to the fact that when the mass defect is broken down between the first and fourth isotopes into two parts in two different options (two ways) and rounding of these parts to an integer, the sum of these integers in two different paths may not coincide in general. It is mathematically easy to prove that the difference of these two sums modulo can not be greater than one, and that it is compensated by the reciprocal difference in the mass (energy) of the gluons_SIF (energy of standing gluon wave - SGW) .

From the foregoing, and in particular from the concept of an integer number of bursting mu-neutrinos, it can be concluded that the **formation (№1) of isotopes according to the "Fan algorithm", which is a combination of orthogonal "horizontal" and "vertical" algorithms, the number of bursting mu--neutrinos in the same isotopes formed by different paths, in the general case may differ. This is explained by the integer nature of the bursting mu neutrinos.**

Let us now further analyze how the number of isotopes is distributed over a certain range (from -0.009% to + 0.009%) of the mass deviation of the isotopes HA and VA.

In Fig. 9-13 shows the distribution of the number of isotopes according to the specified range of mass deviations.

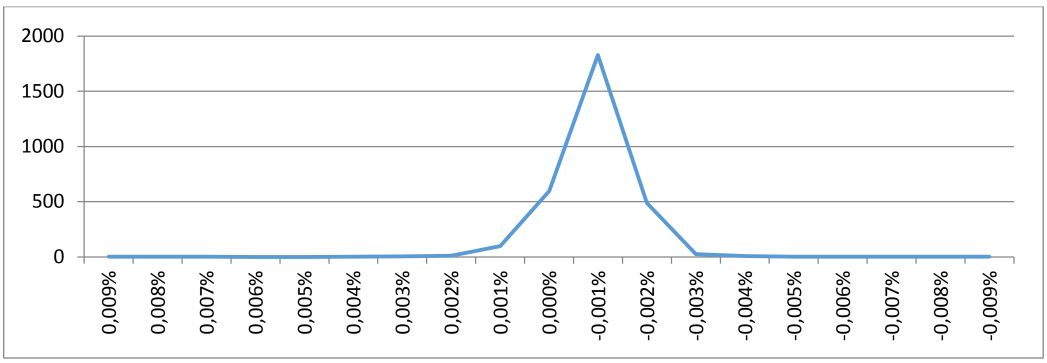


Fig. 9_13. The distribution of the number of isotopes in the range of deviation masses of isotopes of HA and VA (from -0.009% to + 0.009%)

The graph clearly shows the normal distribution law of the dependence constructed. This means that the deviations of the number of remaining mu-neutrinos in the same isotopes after the reactions of nr_nucleosynthesis are of a probabilistic nature. This circumstance indicates the probabilistic nature of the combination of elementary cycles in a particular "fan" way of formation of a specific isotope.

There is one more interesting circumstance. The maximum amount on the graph corresponds to the isotopes not with zero mass deviation, but with a deviation of the mass equal to + 0.001%. Most likely this is due to some factor that we did not take into account when compiling the algorithms HA and VA.
If we "go down" to the level of physical processes, it turns out that the processes of nuclear structure formation are not strictly deterministic, but in reality they are combined with probabilistic processes such as the "game" of gaps between quarks, the spread of the distance from the mu-neutrino burst to the "hoop of quarks ", etc. All this can lead to deviations in the number of bursting mu-neutrinos in the formation of the same isotopes, not only in different ways (through nr_nucleosynthesis or through the reactions of beta decays), but also in isotopes formed in the course of the same reaction, under which there is some probability of formation of slightly different isotopes.
By S_theory, this is entirely permissible. If the base particles from which the isotopes (eg protons or neutrons) are composed have different numbers of mu-neutrinos and, correspondingly, different masses in different isotopes, then the same thing can be assumed about the isotopes themselves.
Taking into account this remark, a possible slight deviation in the number of burst mu-neutrinos in the course of nuclear reactions, we can make the **conclusion (№2) that the number of remaining mu-neutrinos, and hence the mass of the resulting isotopes, is probabilistic in some small range of deviations, even for isotopes formed within the framework of the same nuclear reactions.**
Of course, within the framework of some limited space (by cosmological measures), all the conditions for nr_nucleosynthesis of the entire spectrum of isotopes can coincide and as a result all the same isotopes can be formed along a completely identical path. And this means that they can coincide with the number of mu-neutrinos that remain, and therefore their mass.
Unlike the conclusion we have drawn, in classical physics, the axiom is accepted that the masses of all identical isotopes are equal to each other.
This axiom assumes a priori that identical isotopes have exactly the same (identical) nuclei.
But, is everything so "absolutely identical" in the nuclei of identical isotopes formed, say, as a result of different nuclear reactions (or rather, through different pathways)? S_theory says it does not.
First, they have a completely different sequence of nucleons, which we have already repeatedly noted.
Secondly, we have to state that, according to our calculations, the total number of burst mu-neutrinos in the same isotopes for different ways of formation is small, but different.
Thirdly, let us recall that according to S_theory, the constituent parts of the nuclei (protons and neutrons) in different isotopes have different masses, depending on the number of mu-neutrinos that burst in them. We also pointed out that the α particle with which the nuclei of all isotopes begin, starting from 4He and further, gradually loses its mass (in it the mu neutrino bursts) and acquires the minimum mass in the 56Fe isotope (and subsequent isotopes).
So why are the isotopes themselves, even if they have the same composition of protons and neutrons, but formed in different ways, should have absolutely the same number of mu-neutrinos that have burst and remain in them in the same way and the same mass? For example, after "breaking off" an α particle from any nucleus, we obtain a specific isotope in terms of the composition of the protons and neutrons, but only the nucleon sequence in it, as well as the number of mu-neutrinos remaining in the nucleons, will be completely different from the same isotope initially formed in the process of nr_nucleosynthesis and containing a-particle.
Maybe that's why different experiments on measuring isotope masses sometimes give different results.
From all of the above, we make the **Global conclusion that in the framework of S_theory the possible difference in the masses of identical isotopes exists in reality. This is due to two reasons - the integer and probabilistic nature of the process of the bursted mu-neutrino**.
We call this conclusion <u>Option 1</u> of the answer to our question about the discrepancy between the number of bursting mu-neutrinos and the masses of isotopes in HA and VA. We will <u>call it probabilistic</u>.
This theoretical conclusion of the S-theory, given a certain accuracy in measuring the masses of individual isotopes, can probably be verified experimentally. The positive result of the experiment would be one of their proofs of the validity of the S_theory.
There are, however, two more options for answering the question posed by us.

<u>Option 2. Errors in reference masses of isotopes.</u>

The variant is quite plausible. Readers remember how we successfully changed the masses of five isotopes (by 0.00000000516 aem) in order to reduce the total amount of the remaining mu neutrinos in the 56Fe isotope with 509 pcs. up to 504 pcs. (9 pieces per nucleon).

Similarly, even now, if we reduce the reference mass of the isotope 5He by 0.00000000087 aem, ie, by 0.00000002%, then the total number of burst mu-neutrinos in the isotope 5He becomes equal to 173 pcs. and for HA, and for VA.

The variant, of course, is interesting, but it is hardly possible to correct all the discrepancies between the total number of mu-neutrino bursts in the isotope cloud for HA and VA algorithms (their total quantity is 2,839 cases or 95.6% of the total number of isotopes).

In general, a thorough, scrupulous work on clarifying the reference isotope masses is very important, and we would say - is noble. Precisely the reference isotope masses, in addition to increasing the accuracy of calculations of practical experimental reactions, allow the most reliable way to conduct a preliminary check of the majority of new physical theories. We welcome all sorts of work on clarifying the masses of isotopes, but in our case, this can hardly remove the question of the discrepancy between the number of bursting mu-neutrinos for HA, and for VA.

<u>Option 3 (methodological).</u>

This variant of explaining the discrepancy between the total number of burst mu-neutrinos for HA and VA is related to the methodological basis of S_theory, namely, the technique for calculating the parameters of simples: their mass and length (see Chapter 3).

The fact is that we calculated the parameters of simples using the reference masses of quarks u(SM) and d(SM) determined by the mathematical modeling method, associating with their values with components of S_models of the nucleons, consisting of a hoop of quarks and mu-neutrinos strung on it .

In the S_theory, the quarks u(ST) and d(ST) "got rid" of the mu-neutrino necklaces hung on them and, accordingly, they have a completely different mass.

However, purely methodologically, in order to calculate the mass of the mu-neutrino_ST and the u(ST) and d(ST) quarks, we used an artificial method, combining the triad of quarks(ST) with the corresponding number of mu-neutrinos and equating their total mass to the mass of the triad of quarks(SM) for the reference proton and reference neutron.

What were the reasons for this?

The answer is simple - we must be to have the become attached to something, in addition, we sincerely believe that the quarks(SM) are "invented" by physicists "not from the ceiling," but have a certain experimental base.

However, this algorithm for calculating the masses of quarks(ST) is limited by the accuracy of mathematical modeling of reference masses of SM-quarks (2.01 and 4.79 MeV). It is not excluded that these reference masses of quarks(SM) are subject to specification.

In this case, the mass of the mu-neutrino and the quark(ST) masses, are automatically subject to refinement, which will undoubtedly affect the results of calculations of the number of bursting mu-neutrinos at reactions of nr nucleosynthesis .

Assuming the possibility of such a methodological error in the calculations of the masses of simples, quarks and neutrinos, we generally do not abandon the S-models of these particles and nucleons that we have proposed. In our opinion

we can talk only about clarifying the "control" masses of these particles.

This concludes our analysis and analysis of the materials on the nr_nucleosynthesis of the isotope cloud.

Conclusion of chapters 7, 8, 9

The main element of nr_nucleosynthesis is the process of mu-neutrino bursting in the attached relic neutron and other nucleons of the isotope nucleus and the formation of gluon flagellums (standing gluon wave - SGW), which tighten the nucleons of the nucleus into a single aggregate of the "sausage" type.

An analysis of the number of bursting mu-neutrinos made it possible to reveal a number of regularities ("clamps ", "waves", "mountains ", "ravines", "deflection"), which were given a physical interpretation within the framework of the used S-models, and allowed to made a decomposition of the general bursting of mu neutrinos into individual parameters (P, M, Lo, h1 for HA) and (N, M, h1, h2 for VA).
Modeling of these parameters by the method of selection of approximating functions made it possible to construct theoretical models of the "T-key_HA" and "T-key_VA", which allow calculating the number of bursting mu-neutrinos in the process of nr_ nucleosynthesis of isotopes with good approximation.
The used method of approximating functions gave particularly good results in calculating the specific (averaged by one nucleon) isotope parameters, which resulted in a good agreement of the theoretical and experimental graphs of the binding energy of nucleons in the nuclei of the main-stream isotopes and the "rook" - an inverted graph of the binding energy for the isotope cloud .
The practical coincidence of the final calculation results for the two algorithms HA and VA (the total number of burst mu-neutrinos in one the same isotopes and the associated isotope parameters, including its mass) allows us to conclude that the actual process of nr_nucleosynthesis was carried out using models both algorithms. We called the combined model a "Fan Algorithm", which includes algorithms of HA and VA and uses their mathematical apparatus.
The discrepancies in the calculation of the total number of bursting mu-neutrinos between the two theoretical algorithms have, in our opinion, an admissible value, and in combination with other conclusions of S_theory (in particular on the difference between the masses of protons, neutrons and α particles), it is possible to assume that are not errors in calculations or the calculation technique used. An additional analysis of this question allows us to conclude that there may be a discrepancy between the masses of identical isotopes formed by different paths.
The complexity of the task of constructing a CODE (key) for the process of nr_nucleosynthesis suggests that the proposed technique can be further improved, possibly in the direction of constructing a composite algorithm (a bunch of keys) distributed over time.
An additional result of the work done is the establishment of new theoretical boundaries of the isotope cloud and the possibility to carry out a predictive calculation of the mass of new isotopes according to the theoretical models developed "T-key_HA" and "T-key_ VA".

Chapter 10. S_analysis of modern nuclear reactions.

In the previous chapters, we conducted a detailed S_analysis of relic nuclear reactions, the decay of a relic neutron into a proton and an electron, and the reactions of nr_nucleosynthesis. We continue the verification of S_theory by carrying out an S_analysis of modern nuclear reactions.
With S_analysis of the reactions of nr_nucleosynthesis, we at the physical level modeled four different variants of mu neutrino bursting during these reactions. For calculation, we used only three options, and the fourth (exotic) "was put out of brackets". Recall S_formulas of these variants, which reflect the balance of simples during these reactions.
The first option (the decay of a relic neutron into a proton and an electron = mu-neutrino falls into the gap between two quarks d):
$8\nu\mu + 2d \rightarrow (u + d) + e- + \Delta g_{SIF} + 2\ (ve + \gamma) + g_F + \Delta VF$ or
$nr \rightarrow p + e- + \Delta g_{SIF} + 2\ (ve + \gamma) + g_F + \Delta VF$
The second variant (nr_nucleosynthesis with the transformation of the relic neutron into a "simple" neutron = mu-neutrino shrinks and bursts far from the "quark hoop"):
$N\nu\mu \rightarrow N\ (ve + \gamma) + \Delta g_{SIF} + g_F + \Delta VF$, where N> = 1
or $nr \rightarrow n + N\ (ve + \gamma) + \Delta g_{SIF} + g_F + \Delta VF$
The third variant (nr_nucleosynthesis with transformation of a relic neutron into a "simple" proton = mu-neutrino is shrinks and bursts under a quark d):
$N\nu\mu + d = u + e- + \Delta g_{SIF} + g_F + (N-4)\ (ve + \gamma) + \Delta VF$, where N> = 6
or $nr \rightarrow p + e- + (N-4)\ (ve + \gamma) + \Delta g_{SIF} + g_F + \Delta VF$
The fourth variant (exotic - nr_nucleosynthesis during the two-stage transformation of the relic neutron into a "simple" neutron = mu-neutrino is shrinks and bursts under the quark u):
1 step: $6\nu\mu + u = d + e + + 2\ (ve + \gamma) + \Delta g_{SIF} + g_F + \Delta VF$
2 steps: $8\nu\mu + 2d = (d + u) + e- + 2\ (ve + \gamma) + \Delta g_{SIF} + g_F + \Delta VF$
or $nr \rightarrow n + (e + + e-) + 4\ (ve + \gamma) + \Delta g_{SIF} + g_F + \Delta VF$
The fourth variant is less likely, we "was put out it of brackets" and replaced it with the second option when calculating the reactions of nr_nucleosynthesis.
Relict reactions ended with the end of the relic neutron store in the universe. But this does not end of nuclear reactions in the Universe - the reactions of thermonuclear fusion (TNF), the natural nuclear decay (ND), the reactions of α_ and β_ decays and other "modern" nuclear reactions .
In this chapter we will conduct an S_analysis of modern nuclear reactions, derive their S_formulas, calculate the lists of isotopes subject to these reactions, compare them with reference data, and verify the energy balance of these reactions. Let us start with the β-_decay reactions.

S_formula of the reactions of β-_decay of neutrons inside the nuclei of isotopes

As in the previous chapters, we first analyze the variants of the physical models of mu-neutrino bursting in the reactions of β-_decay inside the isotope nuclei.
When analyzing the reactions of nr-nucleosynthesis, we have already "gone through" two variants reactions of the β-_decay , first this is the decay of a free relic neutron and second the transformation of a relic neutron into a proton in the reactions of nr_nucleosynthesis. These reactions correspond to the first and third variants of the S-formula of the mu-neutrino bursting (retaining the previously assigned numbering of the variants). Let us recall the physical models of these variants and estimate the possibility of their use in the reactions of β-decay of neutrons inside the isotope nuclei:
The first option does not suit us, because in the β-_decay reactions, free relic neutrons are absent inside the nuclei of isotopes.
The third option is very close to the reactions of β-_decay of neutrons inside the nuclei of isotopes with one difference consisting in the fact that instead of the relic neutron a "simple" neutron decays, located, in general, not on the edge of the "sausage" of the nucleus, but in the middle of the "sausage" " of the nucleus.

The fact that "simple" neutrons inside the nucleus can also decay, there is nothing "surprising" in this. All the nucleons in the nucleus are under the action of strong interaction forces (SIF) in a compressed state. This compression force is transmitted to the mu-neutrino. Mu-neutrinos at some point can "not withstand" the impact of compression and burst.
Taking into account the fact that in our case, not a relic neutron decays, but a "simple" neutron, let us call this scheme the fifth option of mu-neutrino bursting, which pertains exclusively to the neutron-beta-decay reactions inside the isotope nuclei. S_formula of this option in a collapsed form will look exactly like in the third option, only without the index "r" for the decaying neutron:
The minimum 5-th option: d + 6νμ → u + e- + Δg_{SIF} + g_F + 2 (νe + γ) + ΔVF or
n → p + e- + Δg_{SIF} + g_F + 2 (νe + γ) + ΔVF
The 5-th option in the general form: d + N * νμ → u + e- + Δg_{SIF} + g_F + (N-4) * (νe + γ) + ΔVF or
n → p + e- + Δg_{SIF} + g_F + (N-4) * (νe + γ) + ΔVF, where N> = 6.

Recall, S_formula is the formula for the nuclear reaction (NR) with respect to the balance of simples (S). For example, in Fig. 4_2 (b) shows the S_formula of the decay process of the relic neutron in expanded form. With sufficient skills, the number of simples in each particle can be "kept in mind," and their transition also counted "in the mind," in which case the S_formula takes a simplified form, very similar to the traditional formulas of NR in the form of particles participating in NR. However, in any case, S_formula has a number of differences from the traditional formulas of NR, in particular:
1) The mandatory participants in all the S_formulas of the NR are the bursting mu-neutrinos, consisting of one positive and one negative symbol (Sμ+ and Sμ-).
2) ST_quarks, entering into S_formulas differ from SM_quarks by mass and have the following composition of simples:
- the quark u has a mass of 0.1517065 MeV and consists of four simples Su+,
- the quark d has a mass of 0.1426625 MeV and consists of two simples Sd-.
3) In the S_formulas, gluons are always present (they appear when shortening of the burst simples-spirales), which are distributed on the increase of gluons_SIF (ΔgSIF) inside the nucleus and the increase in free gluons (gF) leaving the isotope after NR. The gluons that remain in the nuclei do not form a cloud of gluons, as the SM, but are combined into flagellums of gluons_SIF , which tighten the nucleons of the nucleus into a single structure.
4) When calculating the balance of simples, their electric charge must be taken into account. Electrons consist of six negative symbols (Se-), and positrons of six positive symbols (Se +).
5) In the compilation of S_formulas, one must bear in mind that when one pair of simples-spirales (or blocks of simples-spirales) is annihilated, having the same but opposite electric charges, one pair of electron-antineutrinos and gamma-quantum is always produced.
6) The need to balance the simples often changes the quantitative composition of traditional particles formed as a result of NR, in particular, electron-antineutrinos and gamma quanta, in comparison with their number in traditional SM-formulas of NR.
The above S_ formulas of β-_decay reactions contain one controlled parameter, - the minimum number of bursting mu-neutrinos should be at least 6 pieces. (otherwise the electron can not formed). This control parameter makes it possible to verify the calculated isotope cloud (in units of the mu-neutrinos remaining in the isotope) for the potential susceptibility of isotopes to β-_decay reactions. For this, the number of remaining mu-neutrinos in the initial isotope should be equal to. minimum of 6 pcs. more than in the isotope formed after the β-_decay reaction.
In accordance with the formulas given above, we perform a verification calculation of all the isotopes of the cloud for their potential suitability for β-_decay reactions. As a result of the calculation, we determine the number of burst and remaining mu-neutrinos, the increase in the mass (energy) of gluons_SIF in the isotope, and the total energy result of the β-_decay reactions.

The algorithm for calculating the reactions of β-_decay

The algorithm for calculating the reactions of β-_decay differs slightly from the algorithm for calculating the reactions of nr-nucleosynthesis (relic neutrons do not participate in the β-_decay reactions). Figure 10_1 shows the S-model of β-_decay reactions.

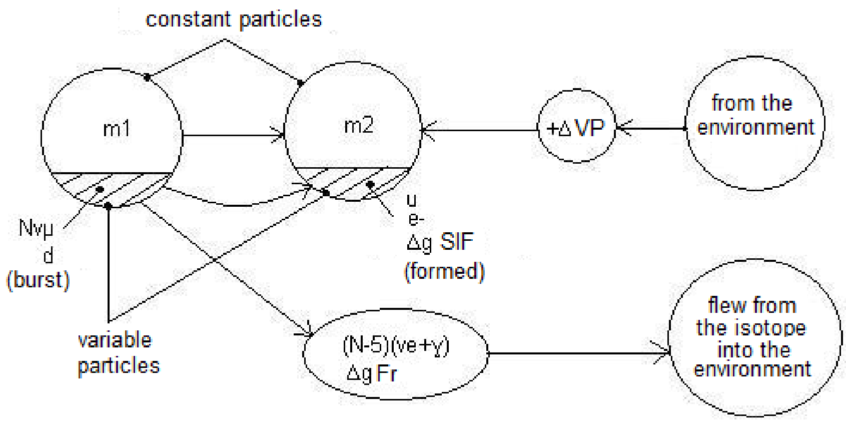


Fig. 10_1. The S-model of the β-decay reaction

The reference mass of isotopes is taken as the basis for the calculation. For each isotope (m1), its potential partner is determined - the isotope result of the β-decay (m2) reaction.

The white part of the "balls" of isotopes are constant isotope particles that do not participate in the β-decay reaction.

The shaded part of the "balls" of isotopes are variable isotope particles participating in the β-decay reaction.

The masses of these isotopes in accordance with ST can be written as follows.

The mass of the first (initial) isotope:

$m_1 = [60v\tau + N_1 v\mu + (u + 2d)] + g_{SIF1} + K + VP_1$, where

the terms in square brackets represent a "simple" neutron inside the nucleus of the isotope, which turns into a "simple" proton during the β-_decay reaction,

N_1 is the number of mu-neutrinos in a given neutron,

g_{SIF1} is the mass (energy) of all gluons-SIF in the nucleus of the initial isotope,

K is the mass of all other nucleons and electrons of the initial isotope,

VF_1 is the mass of flagellums of the VP of the initial isotope (the ionization energy of all electrons).

Then the mass of the second (resulting) isotope should equal:

$m_2 = m_1 - Nv\mu - d + u + e- + \Delta g_{SIF} + \Delta VF = [60v\tau + (N_1\text{-}N)\ v\mu + (2u + d) + e\text{-}] + g_{SIF2} + K + VP_2$ where

the summands in square brackets are the resultant proton and electron formed from the decayed neutron,

N is the total number of bursting mu-neutrinos in the course of the β-_decay reaction (we arbitrarily assign all of them to a decaying neutron, although at a large number of bursting mu-neutrinos they burst in several neighboring nucleons, this does not affect the calculation results)

Δg_{SIF} is the increase in mass (energy) of gluons_SIF,

g_{SIF2} is the mass (energy) of all gluons _SIF in the nucleus of the resulting isotope,

K is the mass of all other nucleons and electrons of the resulting isotope (equal to the parameter K of the initial isotope),

VF_2 is the mass of flagellums of the VP of the resulting isotope (the ionization energy of all electrons).

$VF_2 = VP_1 + \Delta VF$, where ΔVF is the increase in mass (energy) of flagellums VP during the reaction

The remaining mass (energy) of the bursting mu-neutrinos and quark d flew from the isotope in the form of electron-antineutrinos, gamma quarks, and free gluons.

The mass defect of isotopes during the β-_decay reaction is:

$m2\text{-}m1 = -Nv\mu + (u\text{-}d) + e- + \Delta g_{SIF} + \Delta VF$, hence

$N\nu\mu = -(m_2-m_1) + (u-d) + e- + \Delta g_{SIF} + \Delta VF$
Taking the gain of the mass of gluons $\Delta g_{SIF} < \nu\mu$ and $\Delta VF \sim 0$, we obtain the following formula for calculating:
N (pcs) = INTEGER $((m_2-m_1) - (u-d) - e-) / \nu\mu)$

Note:
In the real calculation of the number of burst mu-neutrinos during the β-_decay reactions, we took into account two more limitations:
1) The mass of the second isotope can not be greater than the mass of the first isotope, so all pairs of isotopes in which the mass gain is positive are excluded during the calculation.
2) According to the S_formula of the β-_decay reaction, the number of burst mu-neutrinos can not be less than 6 pcs. (in order for an electron to form).
Further, we calculate the number of remaining mu-neutrinos in the second isotope, taking away the number of mu-neutrinos (N) burst from the number of mu-neutrinos in the first isotope, as well as the mass increase of gluons_SIF, the mass of the gluons_SIF in the second isotope and the change in the ionization energy of isotopes according to the following formulas:
$N_2 = N_1 - N$
$\Delta g_{SIF} = (m_2-m_1) + N\nu\mu$
$g_{SIF2} = g_{SIF1} + \Delta g_{SIF}$
$\Delta VF = VP_2 - VP_1$
We take the mass of gluons_SIF in the first isotope from calculations of the cloud of isotopes in Chapter 6.
The ionization energy of isotopes is taken from the isotope reference book.
Finally, we calculate the energy result of the ($E_{\beta-}$) reactions of β-_decay, as the mass difference (internal energy of the simples) of the burst mu-neutrinos and the quark d, on the one hand, and the mass of the formed quark u, the mass gain of gluons (Δg_{SIF}) and mass formed electron, on the other hand:
$E_{\beta-} = (N\nu\mu + d) - u - \Delta g_{SIF} - e- = (N-4) * (\nu e + \gamma) + g_F$
We remind you that the energy result of all nuclear reactions in ST is identified with the calculated mass (energy) of particles that flew out of the isotope during the reaction, namely, electron-antineutrinos, gamma quanta, and free gluons formed upon shortening and annihilation of simples-spirales. In fact part of this energy result turns into the kinetic energy of all the particles and isotope nuclei formed as a result of the reactions . In this paper, we do not consider physical models of the transformation and distribution of the energy result between all these components. According to our calculations (without taking into account the kinetic energy of the particles), the main part of the energy result is carried away by gamma quanta.
It will be more convenient for us to display the results of calculating the β-_decay reactions in one diagram together with the results of calculating the β+_ decay reactions. Therefore, first we will give an algorithm for calculating the reactions of β+_decay, and then proceed to analyze the calculation results.

S_formula and the algorithm for calculating the reactions β+_ decay of protons in the isotope nuclei

In Fig. 10_2 represents the S_model of reactions of β+ _ decay .

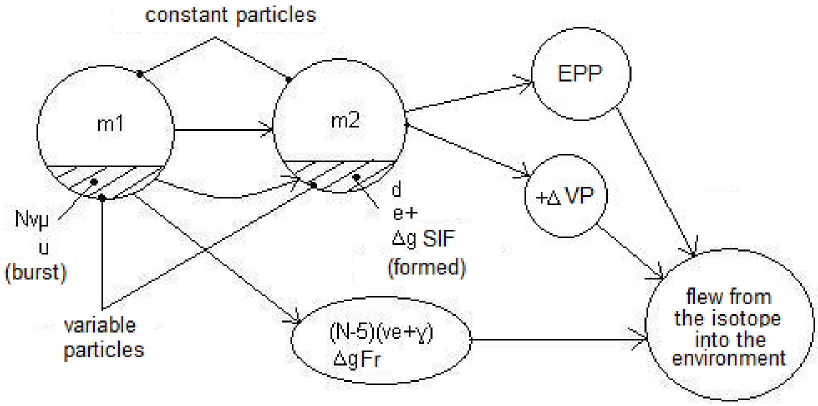


Fig. 10_2. S_model of the β+_ decay reaction

We can not refrain from remarking that the β+_decay of a proton(SM) into a neutron(SM) breaks the classical laws of conservation of mass and energy. In fact, a neutron with a larger mass (energy) is obtained from a proton with a smaller mass (energy).

We have already cited the "explanation" of this "paradox" adopted in the SM, our explanation in ST is another- all protons and neutrons lose mass (energy) in the process of all nuclear reactions due to the bursting of the "surpluses" of the mu-neutrino. Accordingly, all the nucleons (protons and neutrons) involved in the nuclear reaction lose their mass. The proton mass range decreases from 938.272013 to 930.0955216 MeV, and neutrons from 939.5653782 to 930.08808135 MeV. Accordingly, in each concrete reaction β+_decay, the proton mass at the "input" into the reaction is always larger than the neutron mass at the "exit" from the reaction.

The physical model of the reactions of β+_decay in the nucleus of the isotope consists in the following: a mu-neutrino bursts in the proton under the quark u. As a result of the "microexplosion" of the mu-neutrino, occurs the bursting of the quark u ("bursts" into two blocks), and a few (at least 5 pcs) of neighboring mu-neutrinos are bursted to the simples-spirales. From the appeared simples_spirales formed quark d (of two simples Sμ-) and a positron (of six simples Sμ+). The remaining four Sμ- (and four Su+) are annihilated with the formation of two pairs of electron-neutrinos and gamma quanta. After the replacement of the quark, the proton is converted into a neutron, and the initial isotope becomes the isotope of the previous element according to the periodic table. All other decay products are "ejected" from the nucleus and fly away from the isotope, while the positron, flying through the electron shell of the isotope, tears out one electron from it and forms an electron-positron pair (EPP) with it, or they both annihilate (in the case of their bagels bursting at hit).

Let us call this physical model of the reaction of the β+_decay of proton in the nucleus of the isotope the sixth variant of mu-neutrino bursting, below is the S_formula of this reaction.

The minimal 6th option: u + 6νμ → d + e+ + 2 (νe + γ) + Δg_{SIF} + g_F + ΔVF or

p → n + e+ + 2 (νe + γ) + Δg_{SIF} + g_F + ΔVF

The 6th option in the general form: u + Nνμ → d + e+ + (N-4) * (νe + γ) + Δg_{SIF} + g_F + ΔVF or

p → n + e + + (N-4) * (νe + γ) + Δg_{SIF} + g_F + ΔVF

<u>Here one must also make one fundamental remark:</u>

In classical theory, it is assumed that in the β+_decay reactions, an electron-neutrino is produced, and not an antineutrino. Paying tribute to this "tradition", we also removed the underscore sign under the designation of the electronic neutrino.

But in S_theory, the physical annihilation processes in which the electron-antineutrino is produced in the β-_decay reactions and the electron-neutrino in the β+_decay reactions are completely identical. In the first stage the simples-spirales is shortened and "blown off" are completely identical. In the second stage , two arc-shaped simples-spirales with opposite charges, are encountered. Their azimuthal electric vortices are collided, there is a short circuit (micro blast), as a result of which the to the one side , while merged inner magnetic vortex's fly from simples-spirales to the other side and creates a real photon (gamma-quantum). Two toroidal electric vortices was

flying from simples-spirales and form two electronic reverse simples with opposite charges, which "stick together" into the electron-antineutrinos.
But, the process of formation of electron-neutrino in the reactions of β+_decay is absolutely the same. Therefore, according to S_theory, there is no difference between electron-antineutrino and electron-neutrino. In the course of the text of the article, we will call these objects more often electron-antineutrinos, and sometimes electron-neutrinos (in those nuclear reactions where it is accepted in classical nuclear physics). At the same time, we will bear in mind that from the point of view of S_theory, these objects are identical.

Let us continue the analysis of the reactions of β+_ decay.
The algorithm for calculating the isotopes subject to the reactions of β+_decay and the number of burst mu-neutrinos differs from the algorithm for calculating the β-_decay reactions. Let us describe the algorithm for calculating the reactions of β+_decay in more detail.
The mass of the first (initial) isotope:
$m_1 = [60\nu\tau + N_1\nu\mu + (2u + d)] + g_{SIF1} + K_1 + VP_1$, where
the terms in square brackets are a proton that turns into a neutron during the β+_ decay reaction,
N_1 is the number of mu neutrinos in a given proton,
g_{SIF1} is the mass (energy) of all gluons_SIF in the nucleus of the initial isotope,
K_1 is the mass of all other nucleons and electrons of the initial isotope,
VF_1 is the mass of flagellums of the VP of the initial isotope (the ionization energy of all electrons).
The mass of the second (resulting) isotope will then be:
$m_2 = m_1 - N\nu\mu - u + d + e+ + \Delta g_{SIF} - EPP - \Delta VF = [60\nu\tau + (N_1\text{-}N)\ \nu\mu + (u + 2d)] + g_{SIF2} + (K_1 - e\text{-}) + VP_2$
or $m_2 = [60\nu\tau + (N_1\text{-}N)\ \nu\mu + (u + 2d)] + g_{SIF2} + K_2$, where
The terms in square brackets represent the resultant neutron.
The positron is absent in the final mass formula of the second isotope, it flew away, taking with it an electron from the electron shell (this pair we designated EPP), as a result, the parameter K_1 decreased by one electron and became equal to K_2, i.e. $K_2 = K_1 - e\text{-}$.
N is the total number of bursting mu-neutrinos in the course of the β+_decay reaction (conditionally all of them are attributed to a decaying proton, although with a large number of bursting mu-neutrinos they burst in several neighboring nucleons, this condition does not affect the results of calculation)
g_{SIF2} is the mass (energy) of all gluons _SIF in the nucleus of the resulting isotope,
$g_{SIF2} = g_{SIF1} + \Delta g_{SIF}$, where Δg_{SIF} is the increase in mass (energy) of gluons_SIF during the β+_ decay reaction.
VF_2 is the mass of flagellums of the VP of the resulting isotope (the ionization energy of all electrons).
$VF_2 = VP_1 - \Delta VF$, where ΔVF - decrease in mass (energy) of flagellums VP during the reaction, in this case mass (energy) of flagellums VP decreases, because the number of electrons in the isotope decreased.
The remaining mass (energy) of the bursting mu-neutrinos and the quark u flew from the isotope in the form of electron-neutrinos, gamma quarks, and free gluons.
The mass defect of isotopes during the β+_ decay is:
$m_2\text{-}m_1 = - N\nu\mu - u + d - e+ + \Delta g_{SIF} - \Delta VF$, hence
$N\nu\mu = - (m_2\text{-}m_1) - (u\text{-}d) - e+ + \Delta g_{SIF} - \Delta VF$
Taking the gain of the mass of gluons ΔgSIF <νμ and ΔVF ~ 0, we obtain the following formula for calculating:
N (pcs) = WHOLE $((m_2\text{-}m_1) + (u\text{-}d) + e+) / \nu\mu)$

<u>Note:</u>
In the real calculation of the number of burst mu-neutrinos during the reactions of β+_decay, we took into account two more limitations:
1) The mass of the second isotope can not be greater than the mass of the first isotope, so all pairs of isotopes in which the mass gain is positive are excluded during the calculation.
2) According to the S_formula of the β+_decay reaction, the number of burst mu-neutrinos can not be less than 6 pcs. (in order for a positron to form).

Further, we calculate the number of remaining mu-neutrinos in the second isotope, taking the number of mu-neutrinos (N) that have bursted from the number of remaining mu-neutrinos in the first isotope, as well as the increase in the mass of gluons, the mass of gluons in the second isotope, and the change in the ionization energy of isotopes according to the following formulas:

$N_2 = N_1 - N$

$\Delta g_{SIF} = (m_2 - m_1) + N\nu\mu$

$g_{SIF2} = g_{SIF1} + \Delta g_{SIF}$

$\Delta VF = VP_1 - VP_2$

The mass of the gluons in the first isotope is taken from calculations of the isotope clouds in Chapter 6.

The ionization energy of isotopes is taken from the isotope reference book.

Finally, we compute the energy result (Eβ+) of the β+_ decay reactions, as the difference between the masses (internal energy of the simples) of the bursted mu-neutrinos and the quark u, on the one hand, and the mass of the quark d formed, the mass gain of gluons_SIF and the positron formed on the other hand . To the result, we need to add the mass of the EPP (in the case of its annihilation):

$E_{\beta+} = (N\nu\mu + u) - d - \Delta g_{SIF} - e+ + EPP = (N-5) * (\nu e + \gamma) + g_F + EPP$

The transition and distribution of this energy result to other types of energy of the core of a new isotope and other formed particles is not considered by us.

The results of calculating the reactions of β-_decay and β+_decay in S_theory

Because of the large number of isotopes (about 3000 pieces), the calculation results in tabular form would occupy at least 40 pages. Therefore, a full quantitative calculation of all declared parameters is in the Ex-file, which readers can request from us at the e-mail address indicated on the title page. In a condensed form, the results of the calculation are presented in the form of a tabular diagram 13 in the form of a cloud of isotopes, with a color coloring of isotopes potentially "fit" for the β_decay reactions.

As before, the table (diagram) of the cloud of isotopes is presented in an "inverted" form (an increase in the number of neutrons from left to right and an increase in the number of protons from above to below), which coincides with the image of the "rook" in Fig. 6_2.

To save space, we put together in one diagram the results of calculations of isotopes potentially exposed to β-_decays and β+_decays (see Table 13).

Isotopes related to the main stream are colored brown in the diagram.

The square brackets indicate the amount of "extra" mu-neutrinos remaining in the isotope (in excess of the minimum amount of 9 pieces per nucleon) at the beginning of the β_decay reactions (i.e., after the termination of the nr_nucleosynthesis reactions). In the 56Fe isotope, 9 mu-neutrinos (504 mu-neutrino per isotope) are contained in all nucleons, therefore, the number of "superfluous" mu neutrinos in it is equal to 0 pcs.

To the left of the square brackets is the number of mu-neutrinos that burst during the reaction β-_decay of a given (initial) isotope. The resulting isotope formed during the β-_decay reaction is located on the diagram to the left and below the initial isotope.

To the right of the square brackets is the number of mu-neutrinos that burst during the β+_decay of the given (initial) isotope. The resulting isotope formed during the β+_decay reaction is located on the diagram to the right-upward from the initial isotope.

We immediately draw your attention to the fact that the difference in the number of "superfluous" mu neutrinos indicated in the initial isotope and the number of burst mu-neutrinos in the course of the β_ decay reactions indicated to the left and right of the square brackets is in most cases not equal to the number of mu-neutrinos in the resulting isotope (after the nr_nucleosynthesis reaction). We will give an explanation of this inequality in the analysis of calculation results.

Among the isotopes calculated by us, there are susceptible to both the reactions of β-_decay and the reactions of β+_decay. In the diagram they are colored in blue.

Table 13. The diagram of isotopes subject to the reactions of β-decays (11 parts).

Part 1

эл.	p\n	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
H	1	- [44] -	- [83] -	6 [103] -	117 [154] -	117 [205] -	122 [256] -	122 [307] -								
He	2		- [97] -	- [37] -	- [88] -	22 [133] -	61 [184] -	61 [223] -	82 [274] -	82 [325] -						
Li	3		- [142] 106	- [90] -	- [110] -	- [122] -	89 [162] -	77 [191] -	113 [242] -	114 [291] -	131 [342] -					
Be	4		- [188] 98	- [131] 21	- [124] -	- [73] -	- [115] -	6 [129] -	65 [177] -	66 [210] -	93 [261] -	91 [304] -	106 [355] -	106 [406] -		
B	5		- [234] 103	- [187] 63	- [167] 94	- [118] -	- [123] -	- [112] -	75 [144] -	76 [168] -	114 [213] -	106 [249] -	129 [300] -	126 [343] -	148 [394] -	148 [442] -
C	6			- [230] 63	- [204] 86	- [140] 17	- [120] 8	- [70] -	- [94] -	- [101] -	56 [145] -	46 [173] -	74 [220] -	67 [248] -	92 [295] -	88 [330] -
N	7				- [249] 110	- [190] 71	- [160] 91	- [103] 10	- [97] -	- [89] -	59 [126] -	50 [145] -	78 [180] -	71 [202] -	100 [241] -	96 [267] -
O	8					- [236] 77	- [195] 93	- [121] 25	- [100] 13	- [66] -	- [94] -	- [101] -	29 [130] -	24 [140] -	47 [170] -	38 [184] -
F	9						- [241] 120	- [173] 73	- [147] 81	- [107] 13	- [108] 7	- [102] -	41 [117] -	34 [124] -	62 [146] -	49 [156] -
Ne	10							- [216] 69	- [183] 76	- [130] 22	- [118] 15	- [78] -	- [92] -	- [87] -	27 [110] -	17 [113] -
Na	11								- [229] 99	- [175] 58	- [149] 72	- [107] 17	- [98] 13	- [82] -	33 [95] -	24 [97] -
Mg	12								- [275] 100	- [205] 55	- [176] 68	- [122] 23	- [102] 20	- [64] -	- [75] -	- [66] -
Al	13									- [250] 75	- [219] 98	- [165] 64	- [135] 72	- [94] 21	- [83] 19	- [63] -
Si	14									- [292] 73	- [254] 89	- [191] 56	- [161] 66	- [109] 25	- [88] 24	- [46] -
P	15										- [300] 109	- [239] 79	- [204] 95	- [148] 60	- [120] 75	- [74] 24
S	16											- [281] 78	- [243] 96	- [178] 58	- [146] 72	- [94] 31
Cl	17												- [289] 111	- [231] 85	- [191] 97	- [136] 62
Ar	18													- [273] 82	- [233] 97	- [167] 58
K	19														- [278] 112	- [219] 85
Ca	20															- [258] 76

Part 2

эл.	p\n	15	16	17	18	19	20	21	22	23	24	25	26	27	28
C	6	113 [381] -	118 [429] -												
N	7	126 [311] -	131 [352] -	151 [403] -	- [454] -										
O	8	64 [220] -	65 [251] -												
F	9	76 [186] -	75 [213] -	99 [258] -	99 [301] -	120 [352] -	123 [398] -	139 [449] -	140 [499] -						
Ne	10	42 [141] -	43 [162] -	71 [205] -	69 [235] -	86 [279] -	83 [313] -	101 [362] -	101 [404] -	113 [455] -	113 [504] -				
Na	11	54 [117] -	52 [131] -	79 [162] -	75 [189] -	96 [227] -	89 [257] -	111 [299] -	111 [337] -	132 [386] -	129 [430] -	144 [481] -	143 [529] -		
Mg	12	17 [82] -	13 [87] -	44 [118] -	41 [134] -	66 [172] -	58 [191] -	76 [230] -	66 [258] -	91 [305] -	87 [340] -	107 [389] -	105 [427] -	120 [478] -	116 [524] -
Al	13	28 [72] -	23 [72] -	49 [92] -	46 [104] -	73 [132] -	68 [153] -	95 [190] -	80 [212] -	102 [251] -	92 [280] -	112 [320] -	108 [356] -	132 [406] -	122 [448] -
Si	14	- [51] -	- [44] -	11 [59] -	- [60] -	35 [86] -	28 [96] -	60 [133] -	45 [150] -	70 [189] -	61 [210] -	83 [249] -	76 [275] -	105 [326] -	97 [359] -
P	15	- [64] 20	- [48] -	12 [56] -	- [52] -	32 [69] -	25 [74] -	59 [106] -	46 [120] -	68 [150] -	59 [167] -	83 [200] -	77 [222] -	103 [263] -	99 [296] -
S	16	- [74] 27	- [44] -	- [48] -	- [37] -	- [50] -	- [47] -	29 [74] -	19 [81] -	39 [108] -	29 [117] -	48 [145] -	42 [159] -	69 [197] -	63 [219] -
Cl	17	- [109] 66	- [75] 28	- [64] 27	- [46] -	7 [50] -	- [45] -	30 [63] -	22 [70] -	44 [89] -	34 [97] -	54 [117] -	45 [128] -	70 [156] -	65 [173] -
Ar	18	- [135] 60	- [94] 30	- [76] 30	- [44] -	- [47] -	- [34] -	6 [49] -	- [46] -	17 [64] -	7 [64] -	28 [84] -	20 [87] -	40 [110] -	34 [117] -
K	19	- [182] 89	- [137] 62	- [110] 67	- [77] 31	- [63] 30	- [43] -	10 [52] 6	- [48] -	22 [58] -	13 [57] -	34 [68] -	26 [71] -	45 [84] -	39 [90] -
Ca	20	- [219] 83	- [167] 57	- [138] 60	- [97] 34	- [76] 33	- [42] -	- [47] -	- [36] -	- [44] -	- [35] -	- [46] -	- [41] -	14 [52] -	- [49] -
Sc	21	- [265] 98	- [221] 84	- [186] 90	- [143] 68	- [116] 75	- [79] 33	- [67] 32	- [52] 10	- [50] 17	- [40] -	16 [43] -	7 [36] -	25 [42] -	14 [38] -
Ti	22		- [259] 73	- [225] 82	- [176] 61	- [146] 67	- [102] 35	- [86] 35	- [49] -	- [48] 9	- [28] -	- [31] -	- [19] -	- [26] -	- [18] -
V	23			- [271] 95	- [228] 81	- [192] 89	- [146] 59	- [120] 70	- [85] 36	- [64] 36	- [45] 13	- [39] 19	- [27] -	9 [27] 10	- [18] -
Cr	24				- [266] 74	- [229] 83	- [175] 55	- [152] 67	- [103] 39	- [83] 38	- [46] 7	- [40] 12	- [21] -	- [22] -	- [8] -
Mn	25					- [274] 100	- [224] 72	- [192] 90	- [146] 64	- [115] 70	- [77] 39	- [57] 39	- [34] 15	- [28] 23	- [14] -
Fe	26					- [320] 96	- [260] 68	- [227] 82	- [172] 58	- [145] 68	- [99] 42	- [75] 41	- [38] 10	- [31] 18	- [10] -
Co	27						- [306] 79	- [277] 104	- [224] 78	- [190] 91	- [143] 67	- [114] 75	- [74] 42	- [52] 42	- [27] 16
Ni	28						- [352] 75	- [321] 98	- [259] 70	- [225] 83	- [172] 58	- [143] 69	- [97] 45	- [71] 44	- [32] 9
Cu	29									- [271] 99	- [226] 83	- [189] 92	- [143] 71	- [113] 80	- [73] 45
Zn	30										- [267] 79	- [229] 88	- [178] 67	- [147] 76	- [103] 48
Ga	31											- [275] 97	- [236] 89	- [200] 96	- [153] 68
Ge	32												- [281] 82	- [242] 90	- [191] 64
As	33													- [288] 97	- [248] 82

Part 3

эл.	p\n	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43
Al	13	139 [498] -														
Si	14	115 [410] -	115 [451] -													
P	15	117 [337] -	117 [375] -	137 [423] -												
S	16	85 [258] -	86 [286] -	103 [332] -	100 [367] -	116 [418] -										
Cl	17	84 [200] -	86 [230] -	106 [268] -	103 [302] -	121 [347] -	118 [387] -									
Ar	18	56 [145] -	49 [164] -	69 [201] -	62 [228] -	80 [271] -	74 [304] -	93 [352] -								
K	19	68 [116] -	62 [133] -	80 [167] -	78 [192] -	91 [230] -	89 [260] -	103 [303] -	99 [338] -							
Ca	20	32 [72] -	30 [88] -	43 [115] -	45 [140] -	56 [172] -	59 [201] -	65 [239] -	67 [271] -	76 [312] -						
Sc	21	40 [56] -	38 [70] -	52 [92] -	53 [114] -	64 [139] -	68 [171] -	77 [201] -	72 [233] -	87 [270] -	85 [305] -	98 [345] -				
Ti	22	17 [34] -	14 [42] -	30 [63] -	26 [77] -	44 [105] -	42 [127] -	61 [163] -	54 [185] -	67 [222] -	62 [248] -	77 [287] -	72 [316] -	88 [358] -		
V	23	25 [29] -	22 [34] -	41 [52] -	35 [63] -	53 [87] -	48 [104] -	66 [132] -	62 [156] -	78 [187] -	72 [211] -	89 [245] -	82 [271] -	99 [308] -	92 [337] -	
Cr	24	- [16] -	- [14] -	17 [31] -	12 [37] -	30 [59] -	25 [70] -	44 [98] -	39 [113] -	54 [143] -	44 [160] -	62 [193] -	54 [213] -	73 [249] -	65 [272] -	81 [310] -
Mn	25	7 [16] -	- [11] -	23 [22] -	18 [26] -	37 [42] -	31 [51] -	48 [70] -	43 [86] -	62 [112] -	53 [128] -	69 [155] -	58 [173] -	75 [204] -	69 [226] -	81 [259] -
Fe	26	- [10] -	- [0] -	- [9] -	- [5] -	12 [20] -	- [23] -	25 [43] -	17 [50] -	37 [75] -	30 [86] -	48 [114] -	38 [128] -	54 [156] -	48 [177] -	66 [210] -
Co	27	- [23] 22	- [12] -	- [16] 10	- [10] -	18 [20] -	10 [20] -	32 [35] -	23 [40] -	43 [58] -	35 [68] -	57 [92] -	50 [105] -	68 [132] -	57 [146] -	76 [177] -
Ni	28	- [27] 15	- [12] -	- [14] -	- [3] -	- [11] -	- [4] -	- [18] -	- [17] -	15 [35] -	- [37] -	23 [56] -	15 [65] -	34 [91] -	24 [103] -	44 [131] -
Cu	29	- [57] 44	- [39] 24	- [35] 31	- [22] 10	- [25] 19	- [17] -	6 [25] 7	- [22] -	18 [34] -	6 [35] -	27 [51] -	18 [57] -	39 [79] -	28 [87] -	48 [110] -
Zn	30	- [83] 47	- [53] 20	- [48] 28	- [29] 6	- [30] 16	- [17] -	- [25] -	- [16] -	- [29] -	- [25] -	8 [41] -	- [42] -	18 [61] -	6 [64] -	26 [86] -
Ga	31	- [128] 74	- [97] 48	- [78] 47	- [61] 28	- [56] 36	- [42] 15	- [43] 26	- [33] -	- [39] 13	- [34] -	12 [43] -	- [43] -	25 [58] -	12 [59] -	32 [75] -
Ge	32	- [166] 70	- [127] 50	- [109] 50	- [76] 22	- [72] 31	- [51] 9	- [53] 20	- [37] -	- [43] 10	- [31] -	- [42] -	- [35] -	- [49] -	- [45] -	10 [60] -
As	33	- [218] 91	- [177] 68	- [153] 78	- [120] 48	- [103] 52	- [82] 30	- [77] 41	- [62] 19	- [62] 31	- [50] 9	- [55] 21	- [47] -	11 [55] 11	- [50] -	19 [61] -
Se	34			- [193] 73	- [153] 50	- [134] 52	- [100] 23	- [96] 34	- [72] 10	- [73] 23	- [54] -	- [59] 12	- [45] -	- [52] -	- [42] -	- [53] -
Br	35				- [199] 65	- [181] 82	- [146] 51	- [126] 55	- [103] 30	- [100] 45	- [82] 22	- [80] 35	- [66] 14	- [67] 24	- [58] -	7 [64] 17
Kr	36					- [219] 73	- [176] 50	- [155] 52	- [124] 25	- [117] 36	- [93] 14	- [89] 24	- [71] -	- [72] 14	- [57] -	- [63] 6
Rb	37						- [222] 67	- [207] 83	- [171] 54	- [147] 54	- [126] 36	- [116] 44	- [100] 26	- [96] 37	- [82] 17	- [82] 28
Sr	38							- [246] 75	- [205] 58	- [180] 55	- [146] 31	- [134] 35	- [112] 18	- [107] 26	- [88] 8	- [89] 19
Y	39									- [226] 80	- [190] 56	- [167] 55	- [143] 36	- [135] 47	- [116] 27	- [111] 40
Zr	40										- [222] 56	- [199] 57	- [162] 28	- [153] 38	- [129] 19	- [124] 29
Nb	41												- [208] 55	- [188] 58	- [163] 38	- [154] 49
Mo	42													- [220] 58	- [184] 30	- [173] 41
Tc	43														- [230] 57	- [210] 59
Ru	44															- [246] 61

эл.	p\n	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59
Mn	25	74 [284] -															
Fe	26	56 [230] -	73 [263] -	62 [285] -													
Co	27	64 [194] -	82 [226] -	72 [245] -	90 [278] -	81 [300] -											
Ni	28	35 [145] -	52 [174] -	44 [189] -	58 [220] -	54 [239] -	67 [272] -	60 [292] -									
Cu	29	38 [121] -	55 [144] -	48 [161] -	63 [185] -	58 [205] -	71 [233] -	63 [253] -	86 [292] -								
Zn	30	16 [91] -	36 [116] -	26 [125] -	42 [150] -	38 [164] -	52 [192] -	42 [208] -	67 [246] -	61 [273] -	74 [313] -						
Ga	31	22 [80] -	41 [99] -	31 [108] -	47 [127] -	41 [140] -	59 [165] -	48 [178] -	71 [211] -	65 [238] -	79 [273] -	73 [302] -	87 [340] -				
Ge	32	- [60] -	18 [78] -	8 [82] -	26 [102] -	18 [109] -	37 [133] -	29 [144] -	52 [176] -	45 [197] -	58 [232] -	53 [256] -	66 [293] -	63 [322] -	76 [364] -		
As	33	7 [59] -	26 [72] -	16 [75] -	33 [90] -	24 [95] -	42 [114] -	33 [123] -	56 [151] -	52 [173] -	65 [203] -	60 [227] -	71 [259] -	68 [288] -	81 [326] -	76 [358] -	88 [397] -
Se	34	- [47] -	- [60] -	- [57] -	12 [71] -	- [72] -	23 [91] -	13 [95] -	37 [121] -	31 [138] -	42 [166] -	40 [188] -	54 [220] -	50 [245] -	63 [282] -	57 [309] -	70 [348] -
Br	35	- [57] -	14 [65] 8	- [61] -	20 [71] -	9 [70] -	28 [84] -	19 [87] -	44 [110] -	40 [127] -	52 [151] -	47 [170] -	59 [198] -	56 [222] -	69 [256] -	62 [282] -	75 [317] -
Kr	36	- [52] -	- [60] -	- [51] -	- [61] -	- [55] -	7 [67] -	- [64] -	24 [85] -	19 [98] -	30 [121] -	27 [138] -	38 [165] -	36 [186] -	50 [219] -	43 [242] -	56 [277] -
Rb	37	- [71] 10	- [74] 21	- [66] -	8 [69] 12	- [63] -	13 [67] -	- [64] -	32 [82] -	27 [94] -	39 [114] -	35 [130] -	47 [153] -	43 [172] -	59 [201] -	53 [223] -	66 [255] -
Sr	38	- [72] -	- [75] 10	- [61] -	- [66] -	- [55] -	- [60] -	- [51] -	11 [67] -	6 [76] -	18 [95] -	14 [106] -	26 [128] -	22 [142] -	36 [169] -	32 [188] -	43 [217] -
Y	39	- [96] 22	- [93] 33	- [80] 15	- [79] 26	- [66] 8	- [66] 17	- [55] -	16 [69] -	12 [77] -	23 [92] -	19 [102] -	30 [119] -	27 [132] -	41 [154] -	39 [172] -	51 [199] -
Zr	40	- [104] 12	- [102] 23	- [84] 6	- [83] 17	- [67] -	- [67] 13	- [53] -	- [65] -	- [69] -	- [83] -	- [89] -	9 [105] -	- [113] -	18 [133] -	15 [149] -	28 [175] -
Nb	41	- [133] 30	- [126] 41	- [110] 26	- [107] 38	- [89] 20	- [85] 31	- [71] -	- [79] 9	- [82] -	14 [94] -	8 [99] -	20 [112] -	14 [119] -	28 [137] -	23 [151] -	37 [171] -
Mo	42	- [151] 26	- [141] 33	- [121] 16	- [116] 28	- [95] 11	- [91] 22	- [73] -	- [80] -	- [78] -	- [89] -	- [90] -	- [104] -	- [108] -	11 [127] -	- [133] -	18 [154] -
Tc	43	- [185] 44	- [173] 51	- [152] 36	- [141] 46	- [122] 31	- [113] 40	- [95] 15	- [99] 21	- [96] 7	- [104] 14	- [104] -	13 [115] 7	- [117] -	21 [131] -	12 [136] -	28 [153] -
Ru	44	- [208] 36	- [194] 43	- [170] 29	- [159] 37	- [135] 22	- [127] 32	- [106] 6	- [108] 12	- [101] -	- [108] -	- [104] -	- [114] -	- [112] -	- [126] -	- [127] -	7 [144] -
Rh	45	- [254] 60	- [233] 63	- [208] 49	- [192] 57	- [168] 41	- [155] 50	- [133] 25	- [133] 32	- [124] 17	- [128] 25	- [122] 9	- [129] 17	- [126] -	9 [136] 10	- [136] -	16 [149] -
Pd	46		- [269] 61	- [233] 40	- [217] 49	- [188] 33	- [175] 42	- [149] 16	- [148] 23	- [136] 8	- [138] 16	- [129] -	- [135] 8	- [129] -	- [138] -	- [135] -	- [147] -
Ag	47			- [279] 62	- [257] 68	- [227] 52	- [210] 60	- [183] 35	- [178] 42	- [165] 27	- [165] 36	- [156] 20	- [158] 28	- [151] 12	- [156] 21	- [153] -	- [161] 14
Cd	48				- [297] 70	- [253] 43	- [236] 53	- [205] 27	- [200] 35	- [183] 19	- [182] 27	- [168] 12	- [170] 20	- [159] -	- [164] 12	- [156] -	- [164] -
In	49					- [299] 63	- [277] 72	- [244] 44	- [235] 52	- [218] 36	- [214] 46	- [200] 30	- [199] 40	- [188] 24	- [189] 33	- [180] 16	- [184] 25
Sn	50						- [317] 73	- [272] 37	- [264] 46	- [242] 29	- [238] 39	- [220] 22	- [218] 31	- [203] 15	- [204] 25	- [192] 9	- [196] 18
Sb	51									- [288] 50	- [285] 65	- [267] 49	- [261] 57	- [245] 40	- [242] 49	- [229] 32	- [229] 42
Te	52										- [325] 59	- [301] 41	- [296] 52	- [275] 34	- [272] 44	- [254] 26	- [255] 38
I	53												- [342] 67	- [324] 51	- [316] 62	- [298] 44	- [293] 53
Xe	54													- [359] 43	- [353] 54	- [330] 36	- [326] 46
Cs	55														- [399] 69	- [379] 54	- [371] 65
Ba	56															- [414] 44	- [404] 55

эл.	p\n	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74
Se	34	62 [376] -														
Br	35	69 [345] -	81 [380] -	75 [408] -												
Kr	36	47 [300] -	59 [335] -	54 [359] -	65 [395] -	60 [420] -										
Rb	37	59 [278] -	70 [307] -	64 [332] -	76 [362] -	67 [386] -	83 [421] -									
Sr	38	35 [236] -	46 [267] -	41 [285] -	54 [318] -	51 [338] -	65 [375] -	60 [399] -	72 [437] -							
Y	39	44 [218] -	53 [241] -	49 [261] -	56 [284] -	54 [307] -	65 [336] -	63 [362] -	73 [394] -	70 [423] -	81 [457] -					
Zr	40	21 [188] -	33 [212] -	28 [228] -	41 [253] -	35 [271] -	49 [299] -	43 [320] -	56 [351] -	49 [374] -	61 [408] -	56 [433] -				
Nb	41	28 [183] -	42 [204] -	33 [217] -	47 [241] -	38 [255] -	53 [282] -	46 [301] -	60 [331] -	53 [352] -	67 [383] -	60 [406] -	73 [439] -	68 [465] -		
Mo	42	9 [161] -	23 [183] -	15 [193] -	30 [216] -	22 [229] -	36 [254] -	28 [270] -	43 [299] -	33 [316] -	47 [347] -	42 [366] -	55 [398] -	49 [420] -	61 [454] -	
Tc	43	18 [160] -	33 [178] -	23 [186] -	39 [207] -	29 [218] -	45 [242] -	37 [257] -	52 [283] -	43 [299] -	54 [323] -	49 [342] -	61 [371] -	53 [392] -	66 [423] -	58 [446] -
Ru	44	- [147] -	14 [166] -	- [171] -	19 [191] -	11 [199] -	26 [221] -	18 [233] -	34 [258] -	26 [271] -	38 [296] -	31 [312] -	45 [341] -	37 [359] -	51 [390] -	42 [408] -
Rh	45	6 [151] -	22 [166] -	11 [170] -	28 [187] -	17 [194] -	33 [213] -	23 [222] -	39 [243] -	30 [256] -	46 [280] -	37 [295] -	53 [321] -	44 [338] -	59 [366] -	48 [383] -
Pd	46	- [146] -	- [161] -	- [162] -	9 [179] -	- [182] -	15 [202] -	- [207] -	21 [228] -	11 [236] -	28 [260] -	17 [269] -	34 [295] -	25 [308] -	41 [336] -	33 [351] -
Ag	47	- [160] -	12 [171] 8	- [172] -	19 [186] -	9 [189] -	25 [205] -	14 [210] -	31 [228] -	20 [235] -	36 [255] -	26 [264] -	42 [286] -	32 [299] -	48 [322] -	38 [334] -
Cd	48	- [159] -	- [170] -	- [167] -	- [180] -	- [180] -	- [195] -	- [197] -	11 [214] -	- [218] -	17 [237] -	6 [243] -	24 [265] -	13 [272] -	29 [295] -	19 [304] -
In	49	- [178] 9	- [185] 19	- [182] -	7 [191] 12	- [191] -	14 [202] 6	6 [204] -	21 [218] -	11 [221] -	27 [237] -	16 [242] -	32 [260] -	21 [266] -	38 [285] -	27 [293] -
Sn	50	- [186] -	- [193] 11	- [185] -	- [194] -	- [189] -	- [199] -	- [198] -	- [211] -	- [211] -	- [227] -	- [228] -	- [245] -	- [248] -	11 [267] -	- [272] -
Sb	51	- [218] 25	- [221] 36	- [213] 19	- [220] 30	- [214] 14	- [222] 23	- [219] 7	- [230] 17	- [229] -	9 [242] 12	- [243] -	14 [257] 6	- [259] -	19 [275] -	7 [279] -
Te	52	- [242] 21	- [243] 30	- [231] 12	- [237] 24	- [227] 6	- [235] 17	- [228] -	- [238] 10	- [233] -	- [245] -	- [243] -	- [256] -	- [256] -	- [271] -	- [272] -
I	53	- [278] 37	- [276] 47	- [264] 29	- [265] 40	- [256] 23	- [260] 34	- [252] 16	- [259] 28	- [253] 10	- [261] 20	- [258] -	- [268] 15	- [267] -	10 [279] 9	- [280] -
Xe	54	- [306] 28	- [305] 39	- [288] 22	- [289] 31	- [275] 13	- [278] 24	- [267] 6	- [272] 18	- [264] -	- [272] 12	- [266] -	- [276] 7	- [272] -	- [284] -	- [283] -
Cs	55	- [350] 46	- [344] 57	- [328] 39	- [324] 50	- [310] 33	- [309] 42	- [299] 27	- [300] 37	- [291] 20	- [294] 30	- [288] 14	- [294] 24	- [291] 9	- [300] 19	- [299] -
Ba	56	- [381] 38	- [374] 47	- [354] 30	- [349] 39	- [333] 25	- [330] 32	- [316] 17	- [317] 27	- [306] 12	- [310] 21	- [301] 7	- [307] 16	- [300] -	- [309] 11	- [304] -
La	57	- [427] 53	- [420] 66	- [398] 49	- [390] 58	- [372] 43	- [368] 52	- [353] 35	- [352] 45	- [340] 30	- [341] 39	- [332] 24	- [335] 34	- [328] 18	- [333] 28	- [329] 13
Ce	58		- [455] 57	- [431] 41	- [422] 50	- [401] 34	- [395] 44	- [377] 27	- [374] 36	- [359] 20	- [360] 30	- [348] 14	- [351] 25	- [341] 10	- [346] 20	- [338] -
Pr	59			- [477] 55	- [469] 67	- [447] 51	- [439] 61	- [420] 45	- [414] 55	- [399] 38	- [396] 47	- [385] 33	- [384] 42	- [374] 27	- [376] 37	- [368] 22
Nd	60					- [483] 44	- [473] 53	- [452] 37	- [445] 46	- [426] 31	- [422] 38	- [406] 22	- [407] 33	- [394] 18	- [396] 28	- [385] 13
Pm	61						- [519] 67	- [499] 54	- [490] 63	- [471] 48	- [464] 58	- [448] 41	- [444] 50	- [431] 35	- [431] 46	- [421] 31
Sm	62							- [536] 46	- [526] 55	- [504] 40	- [497] 49	- [477] 32	- [474] 42	- [458] 26	- [458] 36	- [444] 21
Eu	63								- [572] 68	- [553] 56	- [543] 66	- [524] 51	- [517] 61	- [501] 44	- [497] 54	- [484] 41
Gd	64											- [559] 42	- [552] 52	- [533] 37	- [528] 45	- [511] 30
Tb	65												- [598] 65	- [581] 53	- [574] 63	- [557] 48
Dy	66													- [618] 44	- [610] 54	- [589] 39
Ho	67														- [656] 67	- [640] 57

эл.	p\n	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89
Tc	43	72 [478] -														
Ru	44	57 [440] -	48 [459] -													
Rh	45	62 [412] -	53 [431] -	67 [461] -												
Pd	46	49 [379] -	38 [394] -	54 [423] -	45 [440] -											
Ag	47	54 [360] -	43 [374] -	58 [400] -	49 [416] -	64 [443] -	55 [461] -	71 [490] -	61 [510] -							
Cd	48	36 [329] -	26 [339] -	42 [364] -	33 [377] -	49 [405] -	41 [419] -	56 [448] -	48 [464] -	73 [505] -	66 [537] -					
In	49	43 [314] -	32 [323] -	47 [344] -	38 [356] -	52 [377] -	44 [392] -	58 [415] -	53 [431] -	79 [469] -	73 [500] -	83 [539] -	76 [572] -			
Sn	50	16 [292] -	- [298] -	21 [319] -	10 [327] -	25 [349] -	15 [359] -	28 [381] -	20 [392] -	46 [429] -	43 [458] -	51 [497] -	48 [527] -	57 [567] -		
Sb	51	23 [296] -	12 [301] -	27 [319] -	16 [326] -	31 [346] -	21 [355] -	33 [375] -	25 [386] -	48 [419] -	47 [450] -	55 [483] -	53 [515] -	61 [550] -	60 [583] -	
Te	52	7 [289] -	- [292] -	11 [310] -	- [315] -	15 [334] -	6 [341] -	19 [360] -	11 [369] -	35 [402] -	31 [427] -	41 [460] -	38 [487] -	47 [522] -	43 [550] -	52 [586] -
I	53	15 [294] -	- [297] -	19 [313] -	9 [317] -	23 [333] -	13 [339] -	25 [356] -	17 [365] -	41 [395] -	35 [418] -	45 [448] -	40 [474] -	50 [506] -	45 [533] -	56 [566] -
Xe	54	- [296] -	- [297] -	- [312] -	- [314] -	6 [330] -	- [334] -	10 [350] -	- [357] -	26 [386] -	18 [405] -	31 [436] -	25 [457] -	36 [489] -	30 [511] -	42 [545] -
Cs	55	- [309] 14	- [310] -	10 [322] 9	- [324] -	14 [337] -	- [340] -	17 [354] -	10 [360] -	32 [387] -	26 [406] -	37 [433] -	32 [454] -	43 [482] -	37 [504] -	49 [535] -
Ba	56	- [314] -	- [312] -	- [324] -	- [324] -	- [337] -	- [338] -	- [351] -	- [355] -	16 [380] -	9 [396] -	21 [422] -	15 [439] -	26 [467] -	20 [486] -	33 [517] -
La	57	- [336] 23	- [334] 9	- [343] 18	- [342] -	6 [352] 13	- [353] -	9 [363] 7	- [366] -	24 [389] -	17 [404] -	28 [427] -	22 [444] -	33 [469] -	25 [486] -	39 [514] -
Ce	58	- [345] 14	- [339] -	- [347] 9	- [344] -	- [354] -	- [352] -	- [362] -	- [363] -	6 [384] -	- [396] -	11 [419] -	- [432] -	17 [457] -	9 [472] -	22 [499] -
Pr	59	- [372] 32	- [366] 18	- [371] 25	- [368] 12	- [375] 22	- [373] 9	- [381] 16	- [381] -	15 [400] -	8 [411] -	19 [431] -	13 [444] -	26 [467] -	18 [481] -	30 [504] -
Nd	60	- [389] 23	- [380] 9	- [385] 17	- [379] -	- [386] 13	- [381] -	- [388] 8	- [386] -	- [404] -	- [412] -	- [432] -	- [442] -	8 [464] -	- [475] -	12 [498] -
Pm	61	- [421] 41	- [413] 27	- [415] 36	- [408] 22	- [411] 30	- [406] 17	- [410] 24	- [407] -	6 [422] 10	- [430] -	12 [447] 6	- [456] -	17 [475] -	9 [486] -	22 [506] -
Sm	62	- [445] 30	- [433] 16	- [435] 25	- [426] 13	- [430] 22	- [421] 9	- [425] 16	- [419] -	- [433] -	- [438] -	- [454] -	- [461] -	- [480] -	- [488] -	- [508] -
Eu	63	- [482] 50	- [469] 35	- [468] 43	- [459] 30	- [459] 39	- [450] 26	- [450] 32	- [444] 12	- [456] 19	- [461] 7	- [475] 14	- [481] -	9 [497] 10	- [505] -	13 [522] 8
Gd	64	- [509] 40	- [493] 26	- [492] 34	- [479] 21	- [479] 30	- [467] 18	- [468] 25	- [458] -	- [469] 9	- [471] -	- [484] -	- [488] -	- [504] -	- [508] -	- [525] -
Tb	65	- [552] 59	- [537] 44	- [530] 51	- [519] 40	- [516] 48	- [504] 36	- [501] 43	- [492] 23	- [500] 29	- [502] 17	- [511] 23	- [515] 12	- [527] 19	- [531] 6	- [544] 17
Dy	66	- [583] 47	- [565] 36	- [559] 41	- [543] 29	- [541] 39	- [525] 26	- [523] 33	- [510] 12	- [518] 18	- [516] 7	- [526] 13	- [526] -	- [538] 9	- [538] -	- [552] 9
Ho	67	- [630] 65	- [611] 52	- [602] 59	- [588] 47	- [582] 57	- [566] 43	- [561] 51	- [548] 30	- [554] 37	- [552] 25	- [559] 33	- [558] 20	- [567] 29	- [567] 14	- [578] 26
Er	68	- [667] 57	- [644] 42	- [636] 49	- [616] 35	- [610] 45	- [592] 32	- [588] 40	- [573] 20	- [578] 27	- [573] 14	- [580] 22	- [576] 9	- [585] 18	- [581] -	- [592] 16
Tm	69		- [690] 54	- [686] 70	- [666] 55	- [657] 64	- [638] 50	- [631] 58	- [616] 38	- [618] 45	- [613] 33	- [618] 42	- [613] 28	- [619] 37	- [616] 23	- [623] 33
Yb	70				- [703] 46	- [693] 54	- [672] 40	- [664] 47	- [645] 27	- [648] 35	- [640] 22	- [644] 31	- [636] 17	- [642] 26	- [635] 12	- [643] 23
Lu	71					- [739] 67	- [723] 59	- [713] 67	- [693] 44	- [694] 53	- [685] 40	- [686] 49	- [678] 35	- [681] 45	- [675] 31	- [679] 40
Hf	72							- [750] 57	- [728] 35	- [728] 43	- [715] 29	- [717] 39	- [706] 25	- [709] 35	- [699] 21	- [704] 31
Ta	73								- [774] 46	- [777] 63	- [763] 47	- [763] 57	- [752] 43	- [751] 52	- [743] 39	- [744] 48
W	74										- [799] 37	- [798] 47	- [783] 33	- [784] 43	- [772] 29	- [774] 39
Re	75											- [844] 61	- [833] 49	- [832] 60	- [819] 46	- [817] 55
Os	76												- [872] 40	- [870] 51	- [854] 36	- [855] 46
Ir	77													- [916] 62	- [906] 52	- [905] 64
Pt	78														- [947] 43	- [945] 54

эл.	p\n	90	91	92	93	94	95	96	97	98	99	100	101	102	103
Te	52	48 [615] -													
I	53	51 [595] -	61 [629] -												
Xe	54	36 [569] -	46 [604] -	41 [630] -	50 [666] -										
Cs	55	43 [559] -	54 [590] -	49 [616] -	61 [648] -	55 [674] -	66 [707] -	60 [734] -							
Ba	56	25 [537] -	37 [568] -	31 [589] -	43 [620] -	38 [643] -	49 [676] -	43 [700] -	53 [734] -						
La	57	31 [533] -	42 [560] -	35 [580] -	45 [607] -	42 [629] -	52 [659] -	49 [683] -	59 [715] -	55 [741] -					
Ce	58	15 [515] -	27 [542] -	22 [559] -	32 [584] -	29 [604] -	37 [631] -	33 [652] -	43 [682] -	38 [705] -	48 [738] -				
Pr	59	21 [519] -	32 [541] -	26 [556] -	37 [579] -	34 [598] -	44 [624] -	39 [644] -	50 [672] -	45 [695] -	55 [725] -	50 [750] -			
Nd	60	- [509] -	16 [531] -	9 [542] -	21 [564] -	18 [580] -	28 [604] -	23 [622] -	33 [649] -	29 [669] -	39 [699] -	34 [721] -	43 [752] -		
Pm	61	10 [514] -	22 [533] -	13 [543] -	25 [562] -	21 [577] -	31 [599] -	27 [616] -	36 [641] -	32 [660] -	43 [687] -	39 [708] -	49 [737] -	45 [761] -	
Sm	62	- [514] -	8 [533] -	- [541] -	12 [560] -	7 [572] -	18 [593] -	14 [608] -	24 [631] -	19 [648] -	29 [674] -	24 [693] -	34 [721] -	30 [743] -	40 [774] -
Eu	63	- [526] -	14 [542] -	- [549] -	16 [565] -	11 [575] -	22 [594] -	17 [607] -	28 [629] -	23 [645] -	34 [669] -	29 [687] -	39 [713] -	35 [734] -	45 [762] -
Gd	64	- [528] -	- [544] -	- [549] -	- [565] -	- [573] -	9 [592] -	- [602] -	14 [622] -	11 [636] -	20 [658] -	16 [674] -	26 [699] -	21 [717] -	31 [744] -
Tb	65	- [545] -	6 [558] 11	- [561] -	8 [575] -	- [582] -	13 [598] -	6 [607] -	17 [624] -	13 [637] -	24 [658] -	19 [673] -	29 [696] -	25 [713] -	36 [738] -
Dy	66	- [552] -	- [565] -	- [567] -	- [581] -	- [585] -	- [601] -	- [607] -	- [624] -	- [633] -	10 [653] -	6 [666] -	16 [687] -	11 [701] -	21 [724] -
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Er	68	- [589] -	- [600] 13	- [599] -	- [611] 8	- [612] -	- [625] -	- [628] -	- [643] -	- [648] -	- [664] -	- [673] -	- [691] -	- [702] -	11 [722] -
Tm	69	- [620] 19	- [628] 29	- [626] 16	- [635] 24	- [635] 11	- [647] 20	- [648] 6	- [661] 14	- [665] -	- [679] 7	- [686] -	9 [701] -	- [711] -	13 [728] -
Yb	70	- [638] 9	- [647] 20	- [643] 7	- [653] 16	- [651] -	- [662] 12	- [662] -	- [674] 8	- [676] -	- [690] -	- [695] -	- [710] -	- [717] -	- [733] -
Lu	71	- [674] 26	- [680] 35	- [677] 22	- [685] 32	- [682] 18	- [691] 28	- [690] 14	- [699] 22	- [701] 10	- [712] 16	- [716] 6	- [729] 11	- [735] -	- [749] -
Hf	72	- [696] 17	- [702] 27	- [695] 13	- [703] 24	- [698] 9	- [707] 19	- [704] 7	- [715] 16	- [714] -	- [725] 11	- [727] -	- [739] 6	- [744] -	- [758] -
Ta	73	- [736] 34	- [739] 44	- [732] 29	- [738] 39	- [733] 25	- [740] 35	- [737] 22	- [745] 31	- [744] 18	- [753] 25	- [754] 14	- [765] 20	- [769] 9	- [782] 15
W	74	- [763] 25	- [767] 35	- [758] 20	- [764] 31	- [756] 17	- [763] 27	- [757] 13	- [765] 23	- [761] 10	- [770] 17	- [769] 6	- [779] 13	- [781] -	- [793] 9
Re	75	- [808] 42	- [809] 52	- [800] 37	- [802] 47	- [795] 33	- [799] 43	- [794] 29	- [800] 38	- [796] 26	- [802] 33	- [800] 21	- [808] 28	- [809] 16	- [819] 23
Os	76	- [842] 32	- [843] 43	- [831] 29	- [834] 39	- [824] 25	- [829] 35	- [820] 21	- [826] 31	- [819] 17	- [825] 26	- [821] 14	- [829] 21	- [827] 9	- [837] 17
Ir	77	- [891] 48	- [889] 58	- [878] 44	- [878] 55	- [868] 40	- [869] 50	- [861] 36	- [865] 47	- [858] 34	- [863] 42	- [858] 29	- [864] 37	- [861] 24	- [869] 32
Pt	78	- [928] 39	- [928] 50	- [914] 35	- [915] 46	- [903] 32	- [906] 43	- [895] 28	- [900] 39	- [890] 24	- [895] 34	- [888] 21	- [894] 29	- [889] 17	- [896] 25
Au	79	- [974] 46	- [980] 66	- [966] 51	- [964] 61	- [952] 47	- [952] 58	- [942] 42	- [943] 54	- [934] 40	- [937] 50	- [930] 37	- [934] 45	- [929] 33	- [934] 40
Hg	80		- [1023] 57	- [1005] 42	- [1004] 53	- [989] 38	- [989] 49	- [976] 34	- [978] 45	- [966] 30	- [970] 41	- [959] 27	- [964] 37	- [955] 23	- [961] 32
Tl	81						- [1035] 59	- [1026] 49	- [1025] 60	- [1013] 44	- [1014] 56	- [1003] 40	- [1007] 53	- [997] 37	- [1002] 49
Pb	82							- [1067] 42	- [1066] 53	- [1052] 38	- [1053] 50	- [1040] 33	- [1043] 46	- [1031] 29	- [1035] 42
Bi	83												- [1089] 58	- [1084] 48	- [1086] 60

эл.	p\n	104	105	106	107	108	109	110	111	112	113	114	115	116	117
Eu	63	42 [785] -													
Gd	64	27 [765] -	37 [795] -												
Tb	65	33 [758] -	43 [785] -	39 [807] -											
Dy	66	17 [741] -	27 [767] -	23 [787] -	32 [815] -										
Ho	67	21 [742] -	31 [766] -	28 [785] -	38 [811] -	35 [833] -									
Er	68	8 [736] -	17 [758] -	14 [774] -	23 [799] -	19 [818] -	28 [845] -								
Tm	69	10 [741] -	20 [761] -	16 [776] -	25 [799] -	22 [816] -	33 [841] -	29 [862] -							
Yb	70	- [743] -	6 [762] -	- [776] -	11 [797] -	7 [811] -	18 [836] -	16 [854] -	24 [880] -						
Lu	71	- [758] -	10 [775] -	6 [787] -	15 [805] -	11 [819] -	20 [839] -	18 [857] -	26 [879] -	24 [899] -	31 [923] -				
Hf	72	- [765] -	- [781] -	- [790] -	- [808] -	- [819] -	9 [839] -	- [853] -	14 [875] -	11 [892] -	20 [916] -	15 [933] -	24 [959] -	19 [977] -	
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W	74	- [796] -	- [809] -	- [814] -	- [829] -	- [836] -	- [853] -	- [864] -	6 [884] -	- [896] -	10 [917] -	- [931] -	17 [955] -	10 [968] -	21 [992] -
Re	75	- [821] 12	- [832] 18	- [835] 7	- [848] 13	- [853] -	- [869] 6	- [878] -	9 [895] -	- [906] -	15 [925] -	9 [938] -	20 [958] -	14 [972] -	26 [993] -
Os	76	- [837] 6	- [848] 14	- [849] -	- [861] 9	- [865] -	- [880] -	- [886] -	- [903] -	- [911] -	- [930] -	- [939] -	- [959] -	- [969] -	9 [989] -
Ir	77	- [868] 20	- [877] 28	- [878] 16	- [888] 23	- [891] 11	- [904] 18	- [908] 6	- [923] 13	- [929] -	6 [945] 8	- [952] -	11 [969] -	- [978] -	15 [996] -
Pt	78	- [893] 13	- [902] 22	- [901] 10	- [912] 17	- [913] -	- [926] 14	- [927] -	- [941] 8	- [944] -	- [960] -	- [964] -	- [981] -	- [987] -	- [1005] -
Au	79	- [931] 28	- [937] 35	- [936] 24	- [944] 31	- [944] 18	- [955] 27	- [955] 13	- [966] 22	- [968] 8	- [981] 17	- [985] -	- [998] 11	- [1003] -	7 [1018] 6
Hg	80	- [954] 19	- [962] 28	- [956] 15	- [965] 24	- [961] 9	- [971] 19	- [969] 6	- [980] 15	- [979] -	- [991] 10	- [992] -	- [1005] 6	- [1008] -	- [1022] -
Tl	81	- [994] 32	- [999] 43	- [994] 28	- [1002] 40	- [997] 25	- [1006] 36	- [1003] 21	- [1012] 31	- [1011] 18	- [1021] 27	- [1021] 13	- [1032] 21	- [1035] 10	- [1047] 16
Pb	82	- [1025] 27	- [1030] 38	- [1022] 22	- [1029] 34	- [1022] 19	- [1030] 30	- [1025] 16	- [1034] 25	- [1030] 12	- [1040] 22	- [1038] 9	- [1048] 17	- [1048] -	- [1059] 13
Bi	83	- [1076] 44	- [1079] 55	- [1071] 40	- [1074] 49	- [1068] 35	- [1073] 46	- [1068] 32	- [1074] 42	- [1070] 28	- [1077] 37	- [1075] 25	- [1084] 34	- [1083] 22	- [1092] 29
Po	84	- [1112] 34	- [1114] 44	- [1104] 32	- [1108] 42	- [1099] 27	- [1105] 38	- [1098] 25	- [1105] 35	- [1099] 22	- [1107] 32	- [1103] 19	- [1111] 28	- [1109] 16	- [1118] 24
At	85					- [1145] 40	- [1148] 51	- [1143] 39	- [1148] 49	- [1142] 35	- [1147] 45	- [1142] 32	- [1148] 41	- [1145] 29	- [1153] 37
Rn	86						- [1186] 44	- [1176] 29	- [1180] 40	- [1173] 27	- [1179] 37	- [1173] 25	- [1180] 34	- [1175] 21	- [1183] 30
Fr	87									- [1219] 40	- [1224] 52	- [1217] 39	- [1222] 48	- [1217] 35	- [1223] 44
Ra	88											- [1252] 30	- [1256] 40	- [1249] 27	- [1255] 36
Ac	89														- [1301] 51

эл.	p\n	118	119	120	121	122	123	124	125	126	127	128	129	130	131
W	74	14 [1007] -													
Re	75	20 [1008] -	30 [1030] -												
Os	76	- [1001] -	14 [1023] -	10 [1038] -											
Ir	77	9 [1008] -	21 [1027] -	15 [1040] -	25 [1060] -	19 [1075] -									
Pt	78	- [1013] -	7 [1032] -	- [1042] -	12 [1063] -	7 [1074] -	18 [1096] -	13 [1109] -							
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Hg	80	- [1027] -	- [1042] -	- [1049] -	- [1066] -	- [1075] -	6 [1093] -	- [1103] -	12 [1123] -	10 [1137] -	29 [1170] -	23 [1194] -	32 [1227] -	26 [1251] -	
Tl	81	- [1051] 6	- [1063] 11	- [1069] -	- [1083] -	- [1091] -	7 [1106] -	- [1116] -	12 [1132] -	11 [1146] -	30 [1176] -	25 [1200] -	33 [1231] -	27 [1255] -	35 [1286] -
Pb	82	- [1061] -	- [1073] 8	- [1076] -	- [1089] -	- [1094] -	- [1108] -	- [1115] -	- [1129] -	- [1140] -	7 [1169] -	- [1192] -	11 [1222] -	6 [1245] -	14 [1276] -
Bi	83	- [1093] 18	- [1104] 26	- [1107] 15	- [1119] 22	- [1124] 12	- [1137] 18	- [1144] 11	- [1157] 13	- [1167] -	10 [1193] -	6 [1216] -	15 [1243] -	11 [1266] -	21 [1295] -
Po	84	- [1118] 13	- [1128] 20	- [1130] 10	- [1142] 17	- [1145] 8	- [1158] 13	- [1163] -	- [1176] 8	- [1185] -	- [1211] -	- [1229] -	- [1256] -	- [1275] -	7 [1303] -
At	85	- [1152] 25	- [1161] 32	- [1162] 22	- [1172] 29	- [1175] 19	- [1186] 24	- [1191] 16	- [1203] 19	- [1212] -	- [1235] 7	- [1253] -	8 [1277] -	- [1295] -	14 [1321] -
Rn	86	- [1180] 19	- [1189] 26	- [1189] 15	- [1199] 23	- [1201] 13	- [1212] 19	- [1215] 10	- [1227] 13	- [1235] -	- [1258] -	- [1272] -	- [1296] -	- [1311] -	- [1336] -
Fr	87	- [1220] 32	- [1227] 40	- [1225] 29	- [1233] 35	- [1234] 25	- [1243] 31	- [1246] 22	- [1256] 25	- [1263] 9	- [1284] 16	- [1298] 6	- [1319] 12	- [1333] -	- [1355] 8
Ra	88	- [1250] 24	- [1257] 32	- [1254] 21	- [1262] 28	- [1262] 18	- [1271] 25	- [1273] 16	- [1283] 19	- [1289] -	- [1309] 10	- [1320] -	- [1341] 6	- [1352] -	- [1374] -
Ac	89	- [1295] 39	- [1300] 46	- [1297] 35	- [1304] 43	- [1302] 32	- [1309] 38	- [1310] 29	- [1319] 32	- [1324] 16	- [1342] 24	- [1352] 13	- [1371] 20	- [1382] 9	- [1401] 16
Th	90		- [1335] 39	- [1329] 26	- [1335] 34	- [1332] 24	- [1339] 30	- [1338] 21	- [1346] 24	- [1350] 9	- [1367] 17	- [1375] 6	- [1393] 13	- [1401] -	- [1420] 11
Pa	91				- [1381] 49	- [1378] 38	- [1384] 45	- [1382] 35	- [1389] 38	- [1392] 24	- [1408] 32	- [1414] 19	- [1431] 28	- [1438] 16	- [1454] 24
U	92								- [1420] 28	- [1423] 15	- [1437] 23	- [1443] 12	- [1458] 20	- [1464] 9	- [1479] 17

эл.	p\n	132	133	134	135	136	137	138	139	140	141	142	143	144	145
Pb	82	9 [1299] -	19 [1331] -												
Bi	83	15 [1317] -	25 [1347] -	19 [1370] -	30 [1401] -										
Po	84	- [1323] -	11 [1352] -	- [1372] -	16 [1403] -	9 [1424] -									
At	85	7 [1340] -	19 [1367] -	12 [1386] -	23 [1414] -	16 [1434] -	27 [1463] -	20 [1484] -							
Rn	86	- [1351] -	- [1378] -	- [1395] -	10 [1423] -	- [1440] -	14 [1468] -	8 [1487] -	18 [1516] -	11 [1535] -	21 [1565] -	15 [1585] -	24 [1615] -		
Fr	87	- [1370] -	10 [1392] -	- [1409] -	14 [1433] -	9 [1451] -	19 [1476] -	13 [1495] -	23 [1521] -	17 [1540] -	27 [1567] -	21 [1588] -	31 [1615] -	24 [1637] -	34 [1666] -
Ra	88	- [1386] -	- [1408] -	- [1422] -	- [1445] -	- [1461] -	- [1485] -	- [1501] -	10 [1527] -	- [1544] -	13 [1571] -	7 [1589] -	17 [1617] -	11 [1636] -	21 [1665] -
Ac	89	- [1412] 6	- [1430] 10	- [1444] -	- [1464] -	- [1479] -	9 [1500] -	- [1515] -	15 [1538] -	10 [1555] -	19 [1578] -	15 [1596] -	23 [1620] -	18 [1640] -	27 [1666] -
Th	90	- [1428] -	- [1447] 6	- [1457] -	- [1477] -	- [1489] -	- [1510] -	- [1522] -	- [1544] -	- [1558] -	- [1581] -	- [1597] -	10 [1622] -	- [1639] -	14 [1666] -
Pa	91	- [1462] 13	- [1477] 19	- [1487] 9	- [1503] 13	- [1514] -	- [1532] 9	- [1544] -	6 [1563] -	- [1577] -	10 [1598] -	6 [1613] -	15 [1635] -	11 [1653] -	19 [1676] -
U	92	- [1485] 8	- [1501] 14	- [1508] -	- [1524] 9	- [1532] -	- [1550] -	- [1559] -	- [1578] -	- [1589] -	- [1608] -	- [1622] -	- [1644] -	- [1659] -	6 [1682] -
Np	93	- [1521] 20	- [1534] 27	- [1540] 17	- [1553] 22	- [1560] 12	- [1575] 17	- [1584] 8	- [1600] 13	- [1610] -	- [1628] 7	- [1641] -	6 [1661] -	- [1676] -	10 [1697] -
Pu	94			- [1563] 11	- [1577] 17	- [1582] 7	- [1596] 12	- [1603] -	- [1619] 9	- [1628] -	- [1645] -	- [1656] -	- [1675] -	- [1688] -	- [1708] -
Am	95					- [1616] 20	- [1628] 25	- [1634] 15	- [1648] 20	- [1656] 11	- [1671] 15	- [1680] 6	- [1697] 10	- [1709] -	- [1727] -
Cm	96						- [1653] 20	- [1657] 9	- [1670] 15	- [1677] 7	- [1692] 12	- [1700] -	- [1717] 7	- [1727] -	- [1745] -
Bk	97							- [1693] 24	- [1704] 27	- [1709] 18	- [1722] 24	- [1729] 14	- [1743] 19	- [1752] 11	- [1768] 13
Cf	98								- [1732] 23	- [1736] 13	- [1748] 18	- [1754] 10	- [1768] 15	- [1775] 6	- [1791] 10
Es	99										- [1785] 31	- [1790] 22	- [1803] 28	- [1809] 18	- [1823] 22
Fm	100											- [1819] 16	- [1831] 22	- [1837] 14	- [1851] 18

эл.	p\n	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160
Ra	88	15 [1685] -														
Ac	89	22 [1687] -	31 [1714] -													
Th	90	9 [1685] -	17 [1712] -	13 [1732] -												
Pa	91	15 [1695] -	22 [1719] -	18 [1740] -	25 [1766] -											
U	92	- [1699] -	10 [1724] -	- [1743] -	14 [1769] -	10 [1789] -										
Np	93	7 [1714] -	15 [1737] -	10 [1755] -	18 [1779] -	15 [1799] -	22 [1824] -									
Pu	94	- [1723] -	- [1745] -	- [1762] -	6 [1785] -	- [1803] -	10 [1828] -	- [1847] -	13 [1873] -							
Am	95	- [1742] -	7 [1763] -	- [1779] -	11 [1801] -	8 [1819] -	16 [1843] -	12 [1862] -	20 [1887] -	16 [1908] -						
Cm	96	- [1758] -	- [1778] -	- [1792] -	- [1813] -	- [1829] -	- [1852] -	- [1869] -	8 [1894] -	- [1913] -	11 [1940] -	6 [1960] -				
Bk	97	- [1780] 6	- [1798] 10	- [1811] -	- [1830] -	- [1845] -	8 [1866] -	- [1883] -	13 [1907] -	9 [1926] -	17 [1951] -	12 [1971] -	20 [1997] -			
Cf	98	- [1801] -	- [1818] 6	- [1829] -	- [1847] -	- [1860] -	- [1880] -	- [1895] -	- [1918] -	- [1935] -	- [1960] -	- [1978] -	7 [2004] -	- [2023] -		
Es	99	- [1832] 14	- [1847] 18	- [1858] 11	- [1874] 14	- [1886] 6	- [1904] 9	- [1918] -	6 [1940] -	- [1956] -	9 [1979] -	- [1997] -	12 [2021] -	8 [2040] -	16 [2065] -	
Fm	100	- [1858] 10	- [1873] 14	- [1882] 6	- [1898] 11	- [1908] -	- [1925] 6	- [1937] -	- [1958] -	- [1973] -	- [1996] -	- [2012] -	- [2036] -	- [2053] -	- [2078] -	- [2095] -

S_analysis of the results of calculating the reactions of β-_decay

As the calculation results show, the number of bursting mu-neutrinos in the β-_decay reactions is in the range of 6 pcs. (min) up to 151 pcs. (in the β-_decay reaction 24N → 24O). 151 pcs. mu-neutrinos in one nucleon can not burst (there are simply no such mu-neutrinos in any nucleon), they burst in several nucleons, but the very reaction of the β-_decay of the conversion of a neutron into a proton occurs only in one nucleon. In the remaining nucleons, due to the additional compression of nucleons, mu-neutrino bursting occurs in the second variant (the mu-neutrinos burst far from the "quark string" without destroying it). Such an increased number of bursting mu-neutrinos in several nucleons leads to the formation of "through holes" that permeate a group of neighboring nucleons or all the nucleons of the nucleus. "Through holes" that permeate all or separate groups of nucleons of the nucleus are filled with through flagellums of gluons, which provide the most stable compression of nucleons into a single nucleus. That is why the core of the 56Fe isotope, which has the maximum number of through holes (52 pcs.) in all nucleons and, correspondingly, the maximum number of flagellums of gluons permeating all nucleons of the nucleus, is the most stable isotope.

The β-_decay reactions in SM are related to the "weak interaction" reactions. However, according to the calculation results, the maximum number of bursting mu-neutrinos in the β-_decay reactions (151 in the 24N → 24O reaction) is greater than the maximum number of bursting mu-neutrinos in the reactions of nr_nucleosynthesis (126 in the reaction 13O → 14O). This suggests that the β-_decay reactions are not so "weak".

Let us compare the obtained list of isotopes potentially exposed to the β-_decay reactions in ST with reference data from the resource [12], which lists the isotopes that are prone to the β-_decay reactions in the SM.

This comparison reveals a number of discrepancies (problems) that require separate analysis.

The first problem.

Analysis of the results of the comparison immediately gives a completely "unexpected" result for one of the most known reactions of β-_decay. It is a question of the β-_decay of the isotope of tritium (3H), which results in the production of the 3He isotope. The problem lies in the absence of this reaction in the ST_list of potentially possible β-_decay reactions, which was calculated by us.

The reference mass of the isotope 3H is 3.0160492777 aem (the mu-neutrino residue after nr_nucleosynthesis is 127 pcs or 100 "superfluous"). The reference mass of the 3He isotope is 3.0160293191 aem (the mu-neutrino residue after nr_nucleosynthesis is 124 pieces or 97 pieces of "superfluous").

Calculation of the above formula on the basis of reference masses of these isotopes gives the number of burst mu-neutrinos equal to 3 pcs. This contradicts the S_formula of the β-_decay reactions, according to which at least 6 pcs should burst. mu-neutrinos.

Having identified this problem, we somehow immediately "were sad" - on an absolutely "trivial" nuclear reaction, the entire S_theory collapsed.

Once again having rechecked all the postulates and calculations of the S_theory, we did not reveal any errors and decided that it was the reference masses of 3H and 3He isotopes were guilty.

After analyzing the materials on the determination of the masses of these isotopes, we "came across" a source [15], which describes in detail with what difficulty and for how long physicists have determined the mass of the isotope 3H. To do this, they had to create an international team (conglomeration), which, thanks to the substantial financial assistance of the "sponsors", determined the known reference mass of the isotope 3H (tritium). One of the main problems encountered on their way was the process of purification of the tritium sample released from impurities, while a tritium-deuterium pair was an important fraction and a problem in purification.

As is known, isotopes of deuterium are lighter than tritium isotopes, and we assumed that this purification was not performed perfectly. As a result of the presence of isotopes of deuterium in the sample of tritium, its mass was determined with a slight decrease in the lower side.

Having made such an assumption, we decided to "theoretically" correct the "experimental" error and add 3 additional mu-neutrinos to the tritium (3H) isotope. . As a result, ST_ the mass of the 3H isotope became equal to

3.0166477657 aem, instead of reference mass 3H equal to 3.0160492777 aem. The change in the mass of the isotope was 0.000598488 aem or slightly less than 0.02%.

An uncomplicated calculation based on the reference masses of the isotopes 2H, 3H, and ST_ of the 3H isotope shows that the amount of admixture of deuterium atoms in the allocated tritium sample is 6 deuterium atoms per 10,000 tritium atoms.

We must say that for all previous ST_calculations and conclusions of S_theory, this correction of the mass of the isotope 3H does not affect. We reduced from 35 pcs. up to 32 pcs. the number of bursting mu-neutrinos for nr_nucleosynthesis of 3H isotope from isotope 2H (this change was taken into account in all previously calculated and presented the tables and graphs). All the rest, stated in this work remains unchanged.

The second problem.

Let us compare the calculated ST_ list of isotopes subject to the β-_decay reactions in S_theory, with a similar list of isotopes from the resource [12] (let's call it the list_SM).

We have the following differences between the ST list and the list of SM:

A) List ST contains 1166 isotopes, and list_SM - 1126 isotope.

B) Overlapping the lists of ST and SM is 1053 isotopes (90.3% of the list_ST and 93.5% of the list_SM).

C) List ST contains 113 isotopes (9.7% of ST), which are not in the list of SM.

D) The list_SM contains 73 isotopes (6.5% of SM), which are not in the list ST.

The lists of isotopes in (C) and (D) are given in Table. 14 and tabl. 15.

Table. 14. List (C) - list of isotopes included in the list_ST (β-_decay reactions) but absent from the SM list (Wiki-2016)

Mnemonic1	Mnemonic2	Period half-life	Modes of decay Wiki-2016
4H	1_3	1.39(10)×10−22 s [4.6(9) MeV]	n
5H	1_4	>9.1×10−22 s ?	2n
6H	1_5	2.90(70)×10−22 s [1.6(4) MeV]	3n 4n
7H	1_6	2.3(6)×10−23 s#	4n
7He	2_5	2.9(5)×10−21 s [159(28) keV]	n
9He	2_7	7(4)×10−21 s	n
10He	2_8	2.7(18)×10−21 s	2n
10Li	3_7	2.0(5)×10−21 s [1.2(3) MeV]	n
12Li	3_9	<10 ns	n
13Be	4_9	2.7x10−21 s	n
15Be	4_11	<200 ns	0
16Be	4_12	<200 ns	2n
16B	5_11	<190×10−12 s [<0.1 MeV]	n
18B	5_13	<26 ns	n
21C	6_15	<30 ns	n
24N	7_17	<52 ns	n
28F	9_19	<40 ns	n
30F	9_21	<260 ns	0
31F	9_22	1# ms [>260 ns]	0
33Ne	10_23	<260 ns	0
34Ne	10_24	1# ms [>1.5 µs]	0
36Na	11_25	<260 ns	0
37Na	11_26	1# ms [>1.5 µs]	0
38Mg	12_26	1# ms [>260 ns]	0
39Mg	12_27	<260 ns	0
40Mg	12_28	1# ms	0
40Al	13_27	10# ms [>260 ns]	0
41Al	13_28	2# ms [>260 ns]	0
42Al	13_29	1 ms	0
43Si	14_29	15# ms [>260 ns]	0
44Si	14_30	10# ms	0
49S	16_33	<200 ns	n
60Sc	21_39	3# ms	0
62Ti	22_40	10# ms	0
63Ti	22_41	3# ms	0
64V	23_41	10# ms [>300 ns]	0
65V	23_42	10# ms	0

Mnemonic1	Mnemonic2	Period half-life	Modes of decay Wiki-2016
96Br	35_61	20# ms [>300 ns]	0
97Br	35_62	10# ms [>300 ns]	0
98Kr	36_62	46(8) ms	0
99Kr	36_63	40(11) ms	0
100Kr	36_64	10# ms [>300 ns]	0
105Sr	38_67	20# ms [>300 ns]	0
107Y	39_68	30# ms [>300 ns]	0
108Y	39_69	20# ms [>300 ns]	0
109Zr	40_69	60# ms [>300 ns]	0
110Zr	40_70	30# ms [>300 ns]	0
111Nb	41_70	80# ms [>300 ns]	0
112Nb	41_71	60# ms [>300 ns]	0
113Nb	41_72	30# ms [>300 ns]	0
114Mo	42_72	80# ms [>300 ns]	0
115Mo	42_73	60# ms [>300 ns]	0
116Tc	43_73	90# ms [>300 ns]	0
117Tc	43_74	40# ms [>300 ns]	0
118Tc	43_75	30# ms [>300 ns]	0
119Ru	44_75	170# ms [>300 ns]	0
120Ru	44_76	80# ms [>300 ns]	0
122Rh	45_77	50# ms [>300 ns]	0
124Pd	46_78	100# ms [>300 ns]	0
128Ag	47_81	58(5) ms	0
129Ag	47_82	44(7) ms [46(+5−9) ms]	0
131Cd	48_83	68(3) ms	0
132Cd	48_84	97(10) ms	0
135In	49_86	92(10) ms	0
120Sb	51_69	15.89(4) min	β+
136La	57_79	9.87(3) min	β+
144Pm	61_83	363(14) d	β+
150Eu	63_87	36.9(9) y	β+
174Ho	67_107	8# s	0
175Ho	67_108	5# s	0
187Hf	72_115	30# s [>300 ns]	0
188Hf	72_116	20# s [>300 ns]	0
189Ta	73_116	3# s [>300 ns]	0
190Ta	73_117	0.3# s	0

Mnemonic1	Mnemonic2	Period half-life	Modes of decay Wiki-2016
68Mn	25_43	28(4) ms	0
69Mn	25_44	14(4) ms	0
70Fe	26_44	94(17) ms	0
71Fe	26_45	30# ms [>300 ns]	0
72Fe	26_46	10# ms [>300 ns]	0
73Co	27_46	41(4) ms	0
74Co	27_47	50# ms [>300 ns]	0
75Co	27_48	40# ms [>300 ns]	0
83Zn	30_53	80# ms [>300 ns]	0
85Ga	31_54	50# ms [>300 ns]	0
86Ga	31_55	30# ms [>300 ns]	0
87Ge	32_55	0.14# s	0
88Ge	32_56	>=300 ns	0
89Ge	32_57	>150 ns	0
90As	33_57	80# ms [>300 ns]	0
91As	33_58	50# ms [>300 ns]	0
92As	33_59	30# ms [>300 ns]	0
93Se	34_59	50# ms [>300 ns]	0
94Se	34_60	20# ms [>300 ns]	0
95Br	35_60	50# ms [>300 ns]	0

Mnemonic1	Mnemonic2	Period half-life	Modes of decay Wiki-2016
191W	74_117	20# s [>300 ns]	0
192W	74_118	10# s [>300 ns]	0
193Re	75_118	30# s [>300 ns]	0
194Re	75_119	2# s [>300 ns]	0
190Ir	77_113	11.78(10) d	β+
209Hg	80_129	37(8) s	0
210Hg	80_130	10# min [>300 ns]	0
211Tl	81_130	1# min [>300 ns]	0
212Tl	81_131	30# s [>300 ns]	0
215Pb	82_133	36(1) s	0
217Bi	83_134	98.5(8) s	0
218Bi	83_135	33(1) s	0
219Po	84_135	2# min [>300 ns]	0
220Po	84_136	40# s [>300 ns]	0
214At	85_129	558(10) ns	α
223At	85_138	50(7) s	0
229Rn	86_143	12 s	0
248Bk	97_151	>300 y[8]	α
258Es	99_159	3# min	0

Table. 15. List (D) - list of isotopes not included in the list_ST (β-_decay reactions), but present in the SM list (Wiki-2016)

The initial isotope	The resulting isotope	Weight gain (ST_calculation)	Potential of mu neutrino tufting	Period half-life	Modes of decay Wiki-2016
14C	14N	-0.156476285	4	5,730 years	β−
32Si	32P	-0.224313085	4	153(19) y	β−
33P	33S	-0.248466726	5	25.34(12) d	β−
35S	35Cl	-0.167184554	4	87.51(12) d	β−
45Ca	45Sc	-0.255881419	5	162.67(25) d	β−
48Ca	48Sc	-0.2822427	5	43(38)×1018 y	β−β−[n 9]
44V	44Cr	10.65629206	-	111(7) ms	β+ (>99.9%) β−, α (<.1%)
60Fe	60Co	-0.237437836	5	2.6×106 y	β−
63Ni	63Cu	-0.066974423	4	100.1(20) y	β−
66Ni	66Cu	-0.251969144	5	54.6(3) h	β−
76Ge	76As	0.923483212	-	1.78(8)×1021 y	β−β−
79Se	79Br	-0.150902038	4	3.27(8)×105 y	β−
82Se	82Br	0.097527428	-	0.97(5)×1020 y	β−β−
87Rb	87Sr	-0.282640448	5	4.923(22)×1010 y	β−
93Zr	93Nb	-0.091193269	4	1.53(10)×106 y	β−
96Zr	96Nb	-0.160589576	4	20(4)×1018 y	β−β−[n 9]
92Nb	92Mo	-0.356762225	5	3.47(24)×107 a[n 3]	β+ (99.95%) β− (.05%)
100Mo	100Tc	0.168414126	-	8.5(5)×1018 a	β−β−
99Tc	99Ru	-0.293793227	5	2.111(12)×105 a	β−
106Ru	106Rh	-0.039122751	4	373.59(15) d	β−
107Pd	107Ag	-0.033533786	3	6.5(3)×106 a	β−
112Pd	112Ag	-0.287831665	5	21.03(5) h	β−
106Ag	106Cd	-0.195613753	4	23.96(4) min	β+ (99.5%) β− (0.5%)
113Cd	113In	-0.320154509	5	8.04(5)×1015 y	β−
116Cd	116In	0.469473007	-	2.8(2)×1019 y	β−β−
121Sn	121Sb	-0.391041207	5	27.03(4) h	β−

The initial isotope	The resulting isotope	Weight gain (ST_calculation)	Potential of mu neutrino tufting	Period half-life	Modes of decay Wiki-2016
155Eu	155Gd	-0.252714339	5	4.7611(13) y	β−
154Tb	154Dy	-0.23846248	5	21.5(4) h	β+ (99.9%) β− (.1%)
169Er	169Tm	-0.35126641	5	9.392(18) d	β−
168Tm	168Yb	-0.257092361	5	93.1(2) d	β+ (99.99%) β− (.01%)
171Tm	171Yb	-0.096502785	4	1.92(1) y	β−
182Hf	182Ta	-0.374646911	5	8.90(9)×106 y	β−
188W	188Re	-0.348937675	5	69.78(5) d	β−
187Re	187Os	-0.002421885	3	41.2(2)×109 y[n 7]	β− (99.99%) α (10−4%)
191Os	191Ir	-0.312702556	5	15.4(1) d	β−
194Os	194Ir	-0.096595934	4	6.0(2) y	β−
210Pb	210Bi	-0.063434746	4	22.20(22) y 0	β− (100%) α (1.9×10−6%)
216Po	216At	0.473198983	-	0.145(2) s	α β−β− (rare)
218Po	218At	-0.259886843	5	3.10(1) min	α (99.98%) β− (.02%)
212At	212Rn	-0.038191257	3	0.314(2) s 0	α (99.95%) β+ (0.05%) β− (2×10−6%)
220Rn	220Fr	0.869083959	-	55.6(1) s	α β−β− (rare)
221Fr	221Ra	-0.314844993	5	4.9(2) min	α (99.9%) β− (.1%) CD (8.79×10−11%)
225Ra	225Ac	-0.355830731	5	14.9(2) d	β−
226Ra	226Ac	0.641054213	-	1600(7) y	α β−β− (rare) CD (2.6×10−9%)
228Ra	228Ac	-0.045829508	4	5.75(3) y	β−
224Ac	224Th	-0.23846248	5	2.78(17) h 0	β+ (90.9%) α (9.1%) β− (1.6%)
227Ac	227Th	-0.044711715	4	21.772(3) y	β− (98.61%) α (1.38%)
231Th	231Pa	-0.391506954	5	25.52(1) h	β− α (10−8%)
232Th	232Pa	0.499932863	-	1.405(6)×1010 y	α β−β− (rare) SF (1.1×10−9%) CD (2.78×10−10%)
234Th	234Pa	-0.27292776	5	24.10(3) d	β−
238U	238Np	0.14736236	-	4.468(3)×109 y 0	α SF (5.45×10−5%) β−β− (2.19×10−10%)
240U	240Np	-0.400542446	5	14.1(1) h	β− α (10−10%)

The initial isotope	The resulting isotope	Weight gain (ST_calculation)	Potential of mu neutrino tufting	Period half-life	Modes of decay Wiki-2016
126Sn	126Sb	-0.375392107	5	2.30(14)×105 y	β− (66.5%) β− (33.5%)
128Te	128I	1.253697857	-	2.2(3)×1024 y[n 9]	β−β−
130Te	130I	0.41879973	-	790(100)×1018 y	β−β−
129I	129Xe	-0.194309661	4	1.57(4)×107 y	β−
136Xe	136Cs	0.08625635	-	2.165(0.016 (stat), 0.059 (sys))×1021 y[4]	β−β−
130Cs	130Ba	-0.361605994	5	29.21(4) min	β+ (98.4%) β− (1.6%)
135Cs	135Ba	-0.268642887	5	2.3 x106 y	β−
144Ce	144Pr	-0.318570969	5	284.91(5) d	β−
150Nd	150Pm	0.086628948	-	6.7(7)×1018 y	β−β−
147Pm	147Sm	-0.224117471	4	2.6234(2) y	β−
151Sm	151Eu	-0.076568812	4	88.8(24) y	β−

The initial isotope	The resulting isotope	Weight gain (ST_calculation)	Potential of mu neutrino tufting	Period half-life	Modes of decay Wiki-2016
241Pu	241Am	-0.020865467	3	14.290(6) y 0	β− (99.99%) α (.00245%) SF (2.4×10−14%)
244Pu	244Am	0.07526472	-	8.00(9)×107 y 0	α (99.88%) SF (.123%) β−β− (7.3×10−9%)
246Pu	246Am	-0.400542446	5	10.84(2) d	β−
248Cm	248Bk	0.690237099	-	3.48(6)×105 y 0	α (91.74%) SF (8.26%) β−β− (rare)
250Cm	250Bk	-0.037259762	3	8,300# y 0	SF (80%)[n 5] α (11%) β− (9%)
249Bk	249Cf	-0.124075009	4	330(4) d 0	β− α (.00145%) SF (4.7×10−8%)
253Cf	253Es	-0.287179619	5	17.81(8) d	β− (99.69%) α (.31%)
254Cf	254Es	0.651114349	-	60.5(2) d 0	SF (99.69%) α (.31%) β−β− (rare)
256Cf	256Es	0.14903905	-	12.3(12) min	SF (99%) β− (1%) α (10−6%) β−β− (rare)
255Es	255Fm	-0.289694653	5	39.8(12) d 0	β− (92%) α (8%) SF (.0041%)

It is necessary to understand why the ST and SM lists do not coincide (?).

<u>Differences in paragraphs (A) and (B)</u> is a statement, an explanation of their differences is contained in paragraphs (C) and (D).

<u>With the explanation of paragraph (C)</u> "simpler" - it can be assumed that the β-_decay reactions theoretically calculated from ST in the experimental "field" of SM in these isotopes have not yet been "detected" because of the low percent probability of this mode of decay in these isotopes . This list of isotopes can be considered a "program" for additional experimental studies in order to verify these isotopes for the presence of β-_decay reactions.

<u>The situation with the explanation of paragraph (D)</u> is more complicated.

It turns out that these isotopes do not have a reactions of β-_decay in the S_theory, but in fact (according to the list of SM) they are have a reactions of β-_decay (???). It is not a good result, which casts doubt on all calculations on S_theory (!!!).

What are the reasons for this result? There can be three of them:

1) Our calculation of the β-_decay reactions contains some "arithmetic" or algorithmic errors.

2) S_theory is incorrect in principle (is not excluded and this).

3) Remember our idea of existence of identical isotopes formed by different paths and having different masses (different amounts of mu-neutrinos remaining in them). We have already expressed this idea when trying to find the "key" (or "bunch of keys") to the reactions of nr_nucleosynthesis. In this case, the question of the presence of the β-_decay reaction for these isotopes becomes probabilistic, depending on the number of mu-neutrinos remaining in them.

Analysis of possible causes

1) Our the methodology (algorithm) of calculation is based on the idea of the identity of all nuclear reactions with the process of mu-neutrino bursting and the transformation of simples, as we have repeatedly said. Within the framework of this idea of algorithmic and any arithmetic errors, no calculation was found.

2) It is certainly not up to us to judge the correctness of the S-theory. It is based on the idea of stretching virtual photons in a simples-spirales. If the length is long enough, the helix is folded into a bagel. This idea is very "beautiful" and very "deep". It allows us to create a single concept of building an electro-magnetic universe (which we are doing in this work). So far, up to this point, we have succeeded. Ahead of us is planned to analyze on the basis of this concept a number of sections of physics (dark matter, dark energy, field theory, gravity, space), and all this on the basis of simples and electro-magnetic interaction. And now on our way met the list (D). Does he really "bury" everything? We do not agree with this. There remains a way to "bypass" the list (D) through the third option.

3) The third option is the idea of the existence of isotopes of the same species, formed by different paths and having slightly different masses.
We have already expressed this idea earlier when trying to find the "key" to calculate the reference masses of all isotopes in the process of nr_nucleosynthesis.
Our calculation of the number of bursting mu-neutrinos in the reactions of β-_decays gives additional arguments in support of this idea.
We have already noted that most isotopes formed as a result of reactions
β-_decay, he number of remaining mu-neutrinos does not coincide with the analogous amount of mu-neutrinos in the same isotopes formed as a result of the reactions of nr-nucleosynthesis.
Let us analyze this discrepancy. According to calculations, in 933 cases from 1166 isotopes subject to β-_decay in ST, the amount of mu-neutrinos remaining in the resulting isotope after the β-_decay reaction is insignificant (from -7 pcs to +6 pcs.) differs from the number of mu-neutrinos remaining in a similar isotope formed after the nr_nucleosynthesis reaction. 634 isotope have deviations in the negative region, 299 - in the positive.
In Fig. 10_3 is a graph of the number of such isotopes as a function of the deviation of the number of burst mu-neutrinos.

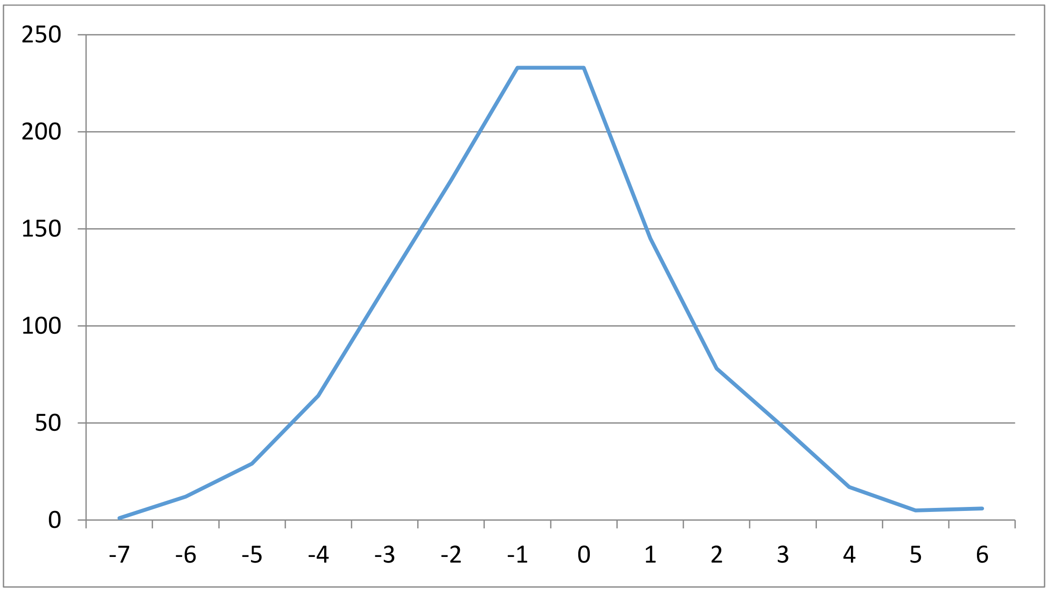


Fig. 10_3. The number of isotopes with deviations of the remaining mu-neutrinos after the reactions of β-_decay and nr_nucleosynthesis

The graph clearly shows the normal distribution law of the dependence constructed. On the whole, this indicates that the deviations of the number of remaining mu-neutrinos in the same isotopes after the β-_decay and nr_nucleosynthesis reactions are of a probabilistic nature.
We recall that when analyzing the reactions of nr_nucleosynthesis we already noted the probabilistic nature of the difference in the number of bursting mu-neutrinos in the isotope formation by the Horizontal and Vertical algorithms of the process of nr_nucleosynthesis.
In view of this circumstance, we return to the analysis of the list (D).
First, there are 18 isotopes in the list (D) in which the "positive" growth of the mass "is observed" during the β-decay reaction, which can not be in either S_ theory or the Standard Model (in Table 15, these isotopes are labeled with a weak brown color). A special issue is the possibility of the β-_decay reaction of isotopes 44V → 44Cr with a mass gain of 10.656292 MeV. Classical SM_physics had to wonder - how did these β-_decay reactions have been "detected" in these isotopes? True, their probability for these isotopes according to the Wiki-2016 data is either very low or "rare," but still there is. The answer to this question is given by the idea that we proposed the possibility of the existence of identical isotopes with small differences in mass. In this case, a small positive mass

defect can "roll over" into a negative mass defect for different batches of experimental isotopes and a probability of the β-_decay reaction arises.
The remaining isotopes in the list (D) have a negative mass defect, but in the "decay mode" graph they basically have a "bare" sign of "β-" without specifying the probability of this decay. We dare to assume that this sign is based on some calculation technique, rather than on the basis of experimental data. In this case, our calculation is "equal in rights", but gives, however, a different result, if we consider the reference masses of isotopes. The potential for mu-neutrino bursting is, in this case, from 3 to 5 pieces, which "lacks" to the minimum required number of ST (6 pcs.) on 1-3 mu-neutrinos. If these calculations are considered to be "nominal" (most probable), then there is a possibility that a part of the isotopes will have a larger number of bursting mu-neutrinos to the required 6 pieces. In this case, the number of symbols released during the β-_decay reaction is sufficient for the formation of an electron and the β-_decay reaction takes place.
Thus, the idea of the possibility of the existence of identical isotopes with different masses explains the discrepancy between the lists of ST and SM isotopes subject to the β-_decay reactions, or rather, it is possible to add part of isotopes from the list (D) to the ST list (but with a lower probability of performing these reactions).

The energy result of the β-decay reactions.

It should be noted that the calculated diagram of isotopes subject to β-_decay reactions should be carefully checked for compliance with the experimental data of all known β-_decay reactions. As a result, it may be possible to find additional discrepancies in the reference isotope masses, which will have to be corrected by the above method (adding or subtracting the mu-neutrino to the reference masses of individual isotopes). Well, an experimental thorough check of the masses of such isotopes will be an indirect confirmation or refutation of individual calculations of S_theory.
Verification should include the verification of the energy result of the reactions.
Unfortunately, the question of the energy of the β-_decay reactions in the Standard Model is not entirely unambiguous.
On the one hand, the general formula for calculating the energy result of the reactions is given: $E_{SM} = (m_1 - m_2) * c^2$, where m1 and m2 are the masses of isotopes before and after the β-_decay reaction.
On the other hand, experimental data of β-_decay reactions which are given in different sources are differ with calculation results for the indicated formula. However, in this case, as a rule, we are talking about the individual components of the released energy, in the greater part about the kinetic energy of individual particles.
Without going into the enumeration of these examples and analyzing this "leapfrog", we just want to note that the energy result of the β-_decay reactions, determined and calculated by the S_theory method, as the sum of the mass (energy) of all the departed particles (free gluons and electron-antineutrinos and gamma- quanta), ideally converges with the result calculated by the formula $E_{SM} = (m_1 - m_2) * c^2$.
In this, however, there is nothing surprising. Analytically, the energy result of the β-_decay reactions in S_ theory can be written as follows:

$$E_{\beta-} = (N\nu\mu + d) - u - \Delta g_{SIF} - e- = (N-5) * (\nu e + \gamma) + g_F$$

This formula is physically equivalent to the mass (energy) that has flown from the isotope, i.e. actually converges with the formula $ECM = (m_1 - m_2) * c^2$. The question of converting the energy result into other types of energy is, of course, not touched in our work.
Calculations show that the energy result of the reactions of β-_decay_ST should be in the range from 0.4273387 MeV (for the isotope 133Xe) to 27.399821 MeV (for the isotope 24N).
In a number of sources, the maximum energy of the β-_decay_SM decay is given as 20.4 MeV and refers to the β-decay of the 11Li isotope into the 11Be isotope. Below is the table 16 with a list of isotopes, the energy result of the β-_ decay reactions of which over ST is more than 21 MeV.

Table. 16. A list of isotopes with an energy of β-_decay greater than 21 MeV

Mnemo-code 1 source isotope	"Superfluous" ν (μ) y source isotope	Period half-life source isotope	Mnemo-code 1 the result tata β-	"Superfluous" ν (μ) y the result tata β-	Bursted ν (μ) at β-	ΔE (ST) (MeV)
4H	154	1.39(10)×10−22 s [4.6(9) MeV]	4He	37	117	21,154
5H	205	>9.1×10−22 s ?	5He	88	117	21,154
6H	256	2.90(70)×10−22 s [1.6(4) MeV]	6He	134	122	22,126
7H	307	2.3(6)×10−23 s#	7He	185	122	22,126
12Li	342	<10 ns	12Be	211	131	23,792
16B	300	<190×10−12 s [<0.1 MeV]	16C	171	129	23,389
17B	343	5.08(5) ms	17C	217	126	22,732
18B	394	<26 ns	18C	246	148	26,915
19B	442	2.92(13) ms	19C	294	148	26,939
22C	429	6.2(13) ms [6.1(+14-12) ms]	22N	311	118	21,247
22N	311	13.9(14) ms	22O	185	126	22,747
23N	352	14.5(24) ms [14.1(+12−15) ms]	23O	221	131	23,781
24N	403	<52 ns	24O	252	151	27,400
28F	352	<40 ns	28Ne	232	120	21,755
29F	398	2.6(3) ms	29Ne	275	123	22,235
30F	449	<260 ns	30Ne	310	139	25,267
31F	499	1# ms [>260 ns]	31Ne	359	140	25,448
34Na	386	5.5(10) ms	34Mg	254	132	23,949
35Na	430	1.5(5) ms	35Mg	301	129	23,427
36Na	481	<260 ns	36Mg	337	144	26,226
37Na	529	1# ms [>1.5 μs]	37Mg	386	143	26,026
39Mg	478	<260 ns	39Al	358	120	21,671
40Al	406	10# ms [>260 ns]	40Si	274	132	23,828
41Al	448	2# ms [>260 ns]	41Si	326	122	22,142
42Al	498	1 ms	42Si	359	139	25,243
44P	337	18.5(25) ms	44S	220	117	21,219
45P	375	8# ms [>200 ns]	45S	258	117	21,154
46P	423	4# ms [>200 ns]	46S	286	137	24,806
50Cl	347	20# ms	50Ar	226	121	21,806
51Cl	387	2# ms [>200 ns]	51Ar	269	118	21,294

The maximum excess of the S_energetic result over the reference value (20.4 MeV) is 7 MeV for the isotope 24N (27.4 MeV). It seems to us that this excess refers to the hard-to-measure components of the energy result, such as the kinetic energy of neutrinos, the energy of free gluons, etc. If so, experimental estimates of the energy result of all "pure" nuclear reactions (without the presence of unaccounted "side" reactions) should be somewhat less than the theoretical ones calculated from the formula $E = (m_1\text{-}m_2) * c^2$ or in S_ theory, as the sum of the departed electron-antineutrinos, gamma quanta and free gluons, as we have revealed for p β-_decay shares.

S_analysis of the results of calculating the reactions of β+_decay

As the calculation results show, the number of bursting mu-neutrinos in the β+_decay reactions is in the range of 6 pcs. (min) up to 120 pcs. (in the β+_decay reaction 14F → 14O).

Let us compare the obtained list of isotopes potentially exposed to the reactions of beta+ decay in ST (see table-diagram 13), with reference data from the resource [12], which lists isotopes subject to the β_decay reactions over the SM.

As a result of the comparison, we get the following differences between the ST list and the SM list:

A) List_ST contains 1276 isotopes, and list_SM - 1167 isotope.

B) Overlapping the lists of ST and SM is 1110 isotope (87% of ST and 95.1% of SM).

C) List_ST contains 165 isotopes (12.9% of ST), which are not on the list of SM.

D) The list of SM contains 57 isotopes (4.9% of SM), which are not in the list ST.

The lists of isotopes in (C) and (D) are given in Table. 17 and tab. 18.

Table. 17. (C) - a list of isotopes included in the list of ST (reactions of β + decay), but absent from the list_SM (Wiki-2016)

Mnemonic1	Mnemonic2	Period half-life	Modes of decay Wiki-2016
4Li	3_1	91(9)×10−24 s [6.03 MeV]	p
5Be	4_1	0	p
6Be	4_2	5.0(3)×10−21 s [0.092(6) MeV]	2p
6B	5_1	0	0
7B	5_2	350(50)×10−24 s [1.4(2) MeV]	p
8C	6_2	2.0(4) × 10−21 s [230(50) keV]	2p
10N	7_3	200(140)×10−24 s [2.3(16) MeV]	p
11N	7_4	590(210)×10−24 s [1.58(+75−52) MeV]	p
12O	8_4	580(30)×10−24 s [0.40(25) MeV]	2p (60.0%) p (40.0%)
14F	9_5	0	p
15F	9_6	410(60)×10−22 s [1.0(2) MeV]	p
16F	9_7	11(6)×10−21 s [40(20) keV]	p
16Ne	10_6	9×10−21 s [122(37) keV]	2p
18Ne	10_8	1.672(8) s	Electron capture (EC) 2p (possibly 2He)[2]
19Na	11_8	<40 ns	p
19Mg	12_7	0	0
21Al	13_8	<35 ns	p
25P	15_10	<30 ns	p
26S	16_10	10# ms	2p
28Cl	17_11	0	p
29Cl	17_12	<20 ns	p
30Cl	17_13	<30 ns	p
30Ar	18_12	<20 ns	p
32K	19_13	unknown	p
33K	19_14	<25 ns	p
34K	19_15	<25 ns	p
34Ca	20_14	<35 ns	p
37Sc	21_16	0	p
38Sc	21_17	<300 ns	p
39Sc	21_18	<300 ns	p
38Ti	22_16	<120 ns	2p
40V	23_17	0	p
41V	23_18	0	p
42V	23_19	<55 ns	p
44Mn	25_19	<105 ns	p
45Mn	25_20	unknown	p
47Co	27_20	0	0
48Co	27_21	0	p
48Ni	28_20	10# ms [>500 ns]	0
49Ni	28_21	13(4) ms [12(+5-3) ms]	0
52Cu	29_23	0	p
53Cu	29_24	<300 ns	p
54Cu	29_25	<75 ns	p
54Zn	30_24	0	2p
56Ga	31_25	0	p
57Ga	31_26	0	p
58Ga	31_27	0	p
59Ga	31_28	0	p
58Ge	32_26	0	2p
59Ge	32_27	0	2p
60As	33_27	0	p
61As	33_28	0	p
62As	33_29	0	p
63As	33_30	0	p
67Br	35_32	0	p
68Br	35_33	<1.2 µs	p
69Br	35_34	<24 ns	p

Mnemonic1	Mnemonic2	Period half-life	Modes of decay Wiki-2016
136Tb	65_71	0.2# s	0
137Tb	65_72	600# ms	0
138Dy	66_72	200# ms	0
139Dy	66_73	600(200) ms	0
140Ho	67_73	6(3) ms	0
141Ho	67_74	4.1(3) ms	0
143Er	68_75	200# ms	0
145Tm	69_76	3.1(3) µs	0
153Hf	72_81	400# ms [>200 ns]	0
155Ta	73_82	13(4) µs [12(+4−3) µs]	0
158W	74_84	1.37(17) ms	α
160Re	75_85	860(120) µs [0.82(+15−9) ms]	p (91%) α (9%)
161Re	75_86	0.37(4) ms	p
162Os	76_86	1.87(18) ms	α
164Ir	77_87	1# ms	0
165Ir	77_88	<1# µs	p α (rare)
166Ir	77_89	10.5(22) ms	α (93%) p (7%)
166Pt	78_88	300(100) µs	0
167Pt	78_89	700(200) µs	0
169Au	79_90	150# µs	0
170Au	79_91	310(50) µs [286(+50−40) µs]	0
171Au	79_92	30(5) µs	p α (rare)
172Au	79_93	4.7(11) ms	α (98%) p (2%)
171Hg	80_91	80(30) µs [59(+36−16) µs]	0
172Hg	80_92	420(240) µs [0.25(+35−9) ms]	0
173Hg	80_93	1.1(4) ms [0.6(+5−2) ms]	0
174Hg	80_94	2.0(4) ms [2.1(+18−7) ms]	0
175Hg	80_95	10.8(4) ms	α
176Tl	81_95	5.2(+30−14) ms	0
177Tl	81_96	18(5) ms	p α (rare)
178Tl	81_97	255(10) ms	α p (rare)
179Tl	81_98	270(30) ms	α p (rare)
178Pb	82_96	0.23(15) ms	0
179Pb	82_97	3# ms	0
180Pb	82_98	4.5(11) ms	0
184Bi	83_101	6.6(15) ms	0
185Bi	83_102	2# ms	p α (rare)
188Po	84_104	430(180) µs [0.40(+20−15) ms]	0
189Po	84_105	5(1) ms	0
193At	85_108	28(+5−4) ms	α
195Rn	86_109	6 ms	0
199Fr	87_112	16(7) ms	0
200Fr	87_113	24(10) ms	α
214Fr	87_127	5.0(2) ms	α
215Fr	87_128	86(5) ns	α
218Fr	87_131	1.0(6) ms	α
202Ra	88_114	2.6(21) ms [0.7(+33−3) ms]	0
206Ra	88_118	0.24(2) s	α
215Ra	88_127	1.55(7) ms	α
217Ra	88_129	1.63(17) µs	α
206Ac	89_117	25(7) ms	0
207Ac	89_118	31(8) ms [27(+11−6) ms]	α
218Ac	89_129	1.08(9) µs	α
221Ac	89_132	52(2) ms	α
209Th	90_119	7(5) ms [3.8(+69−15)]	0
214Th	90_124	100(25) ms	α
215Th	90_125	1.2(2) s	α

Table. 17. (B) - list (continued)

Mnemonic1	Mnemonic2	Period half-life	Modes of decay Wiki-2016
71Rb	37_34	0	p
72Rb	37_35	<1.5 µs	p
73Rb	37_36	<30 ns	p
76Y	39_37	500# ns [>170 ns]	0
78Zr	40_38	50# ms [>170 ns]	0
98Tc	43_55	4.2(3)×106 a	β−
93Ag	47_46	5# ms [>1.5 µs]	0
95Cd	48_47	5# ms	0
97In	49_48	5# ms	0
99Sn	50_49	5# ms	0
105Te	52_53	1 µs#	0
106Te	52_54	70(20) µs [70(+20−10) µs]	α
109I	53_56	103(5) µs	p (99.5%) α (.5%)
123Xe	54_69	2.08(2) h	EC
112Cs	55_57	500(100) µs	p α
124Nd	60_64	500# ms	0
125Nd	60_65	600(150) ms	0
126Pm	61_65	0.5# s	0
127Pm	61_66	1# s	0
146Pm	61_85	5.53(5) y	EC (66%) β− (34%)
128Sm	62_66	0.5# s	0
129Sm	62_67	550(100) ms	0
130Eu	63_67	1.1(5) ms [0.9(+5−3) ms]	0
131Eu	63_68	17.8(19) ms	0
134Gd	64_70	0.4# s	0
135Gd	64_71	1.1(2) s	0

Mnemonic1	Mnemonic2	Period half-life	Modes of decay Wiki-2016
217Th	90_127	240(5) µs	α
218Th	90_128	109(13) ns	α
221Th	90_131	1.73(3) ms	α
223Th	90_133	0.60(2) s	α
212Pa	91_121	8(5) ms [5.1(+61−19) ms]	0
213Pa	91_122	7(3) ms [5.3(+40−16) ms]	α
214Pa	91_123	17(3) ms	α
215Pa	91_124	14(2) ms	α
217Pa	91_126	3.48(9) ms	α
218Pa	91_127	0.113(1) ms	α
220Pa	91_129	780(160) ns	α
221Pa	91_130	4.9(8) µs	α
222Pa	91_131	3.2(3) ms	α
225Pa	91_134	1.7(2) s	α
217U	92_125	26(14) ms [16(+21−6) ms]	α
218U	92_126	6(5) ms	α
219U	92_127	55(25) µs [42(+34−13) µs]	α
223U	92_131	21(8) µs [18(+10−5) µs]	α
224U	92_132	940(270) µs	α
225U	92_133	61(4) ms	α
225Np	93_132	3# ms [>2 µs]	α
226Np	93_133	35(10) ms	α
229Pu	94_135	120(50) s	α
242Fm	100_142	0.8(2) ms	SF α (rare)
244Fm	100_144	3.12(8) ms	SF (99%) α (1%)

The explanation of the differences in the β+_decay reactions from (C) - it can be assumed that the β+_decay reactions calculated by ST for these isotopes have not yet been "discovered" because of the low percentage of the probability of the given decay mode for these isotopes. The list of isotope (see Table 17), calculated according to S_theory, is a program for additional experimental studies to verify the isotopes for the presence of β+_decay reactions.

Table. 18. (D) - a list of isotopes not included in the list of ST (reactions of β + decay), but present in the list_SM (Wiki-2016)

The initial isotope	The resulting isotope	Weight gain (ST_calculation)	Potential of mu neutrino tufting	Period half-life	Modes of decay Wiki-2016
54Mn	54Cr	-1,377213969	5	312.03(3) d 0	EC 99.99% β− (2.9×10−4%) β+ (5.76×10−7%)
59Ni	59Co	-1,07280171	3	7.6(5)×104 y	EC (99%) β+ (1.5x10−5%)[8]
65Zn	65Cu	-1,35206363	5	243.66(9) d	β+
77Br	77Se	-1,364638799	5	57.036(6) h	β+
76Kr	76Br	-1,27521537	5	14.8(1) h	β+
91Nb	91Zr	-1,257703281	4	680(130) a	EC (99.98%) β+ (.013%)
97Ru	97Tc	-1,108477933	4	2.791(4) d	β+
104Rh	104Ru	-1,139217237	4	42.3(4) s	β− (99.55%) β+ (.449%)
105Ag	105Pd	-1,345077424	5	41.29(7) d	β+
104Cd	104Ag	-1,136422754	4	57.7(10) min	β+
107Cd	107Ag	-1,416802467	5	6.50(2) h	β+
113Sn	113In	-1,03675289	3	115.09(3) d	β+
121Te	121Sb	-1,043552797	3	19.16(5) d	β+
128I	128Te	-1,253697857	4	24.99(2) min	β− (93.1%) β+ (6.9%)
122Xe	122I	-0,725633874	2	20.1(1) h	β+
129Cs	129Xe	-1,196597271	4	32.06(6) h	β+
128Ba	128Cs	-0,530020121	1	2.43(5) d	β+
131Ba	131Cs	-1,375816728	5	11.50(6) d	β+
135La	135Ba	-1,200136948	4	19.5(2) h	β+
132Ce	132La	-1,266831923	5	3.51(11) h	β+
137Ce	137La	-1,222120208	4	9.0(3) d	β+
138Nd	138Pr	-1,113135403	4	5.04(9) h	β+
143Pm	143Nd	-1,042062406	3	265(7) d	β+
148Gd	148Eu	-0,027013328	-	74.6(30) y	α β+β+ (rare)
149Gd	149Eu	-1,313406626	5	9.28(10) d	β+ α (4.34×10−4%)
150Gd	150Eu	0,971548306	-	1.79(8)×106 y	α β+β+ (rare)
158Tb	158Gd	-1,219512025	4	180(11) y	β+ (83.4%) β− (16.6%)
154Dy	154Tb	0,23846248	-	3.0(15)×106 y	α β+β+ (rare)
157Dy	157Tb	-1,34265554	5	8.14(4) h	β+
156Er	156Ho	-1,141080225	4	19.5(10) min	β+
163Er	163Ho	-1,210103935	4	75.0(4) min	β+
174Lu	174Yb	-1,374326338	5	3.31(5) y	β+
175Hf	175Lu	-0,686697422	1	70(2) d	β+
177Ta	177Hf	-1,165578518	4	56.56(6) h	β+
179W	179Ta	-1,062368977	3	37.05(16) min	β+
186Pt	186Ir	-1,308749156	5	2.08(5) h	β+ (99.99%) α (1.4×10−4%)
193Au	193Pt	-1,082954995	4	17.65(15) h	β+ (100%) α (10−5%)
202Tl	202Hg	-1,362775811	5	12.23(2) d	β+
198Pb	198Tl	-1,447541771	5	2.4(1) h	β+
200Pb	200Tl	-0,804810869	2	21.5(4) h	β+
208Po	208Bi	-1,400501321	5	2.898(2) y	α (99.99%) β+ (.00277%)
212Rn	212At	0,038191257	-	23.9(12) min	α β+β+ (rare)
214Rn	214At	0,939877508	-	0.27(2) μs	α β+β+ (rare)
214Ra	214Fr	-1,059108747	3	2.46(3) s	α (99.94%) β+ (.06%)
218Ra	218Fr	0,407994399	-	25.2(3) μs	α β+β+ (rare)
224Ac	224Ra	-1,407673825	5	2.78(17) h 0	β+ (90.9%) α (9.1%) β− (1.6%)
224Th	224Ac	0,23846248	-	1.05(2) s	α β+β+ (rare)
230Pa	230Th	-1,310798443	5	17.4(5) d 0	β+ (91.6%) β− (8.4%) α (.00319%)
229U	229Pa	-1,312661431	5	58(3) min	β+ (80%) α (20%)
230U	230Pa	0,559827931	-	20.8 d 0	α SF (1.4×10−10%) β+β+ (rare)
233Np	233U	-1,029114639	3	36.2(1) min	β+ (99.99%) α (.001%)
235Pu	235Np	-1,138937788	4	25.3(5) min	β+ (99.99%) α (.0027%)
236Pu	236Np	0,476924959	-	2.858(8) y	α SF (1.37×10−7%) CD (2×10−12%) β+β+ (rare)
240Am	240Pu	-1,384665922	5	50.8(3) h	β+ α (1.9×10−4%)
242Cm	242Am	0,664527863	-	162.8(2) d	α SF (6.33×10−6%) CD (10−14%)[n 4] β+β+ (rare)
246Bk	246Cm	-1,34721986	5	1.80(2) d	β+ (99.8%) α (.2%)
252Fm	252Es	0,477856453	-	25.39(4) h 0	α (99.99%) SF (.0023%) β+β+ (rare)

<u>Analysis and explanation of the differences in β+ decay reactions according to (D):</u>

In 10 isotopes of type (D), the mass gain is greater than zero, which should not be either in S_theory or in the Standard Model (we marked these isotopes in the table with a weak brown color). It should be noted that all these isotopes in SM are not subject to pure β+ decay. In admissible modes of decay according to Wiki-2016 (SM), they all have an admissible decay mode = β + β + (rare) for all of them.

In another isotope (148Gd), the mass defect is negative, but such an insignificant (-0.0270133 MeV) that it is not enough for the bursting of even one mu neutrino, especially for positron formation.

The remaining 46 pcs. isotope, has the potentials of the number of bursting mu-neutrinos are from 1 to 5 pieces, which "does not hold out" to the minimum amount (6 pieces) per 1-5 mu-neutrino. The shortage of bursting mu-neutrinos in the β+_decay reactions increased in comparison with the β-_decay reactions, but it is also of a probabilistic nature, as in the β-_decay reactions, as evidenced by the graph in Fig. 10_4.

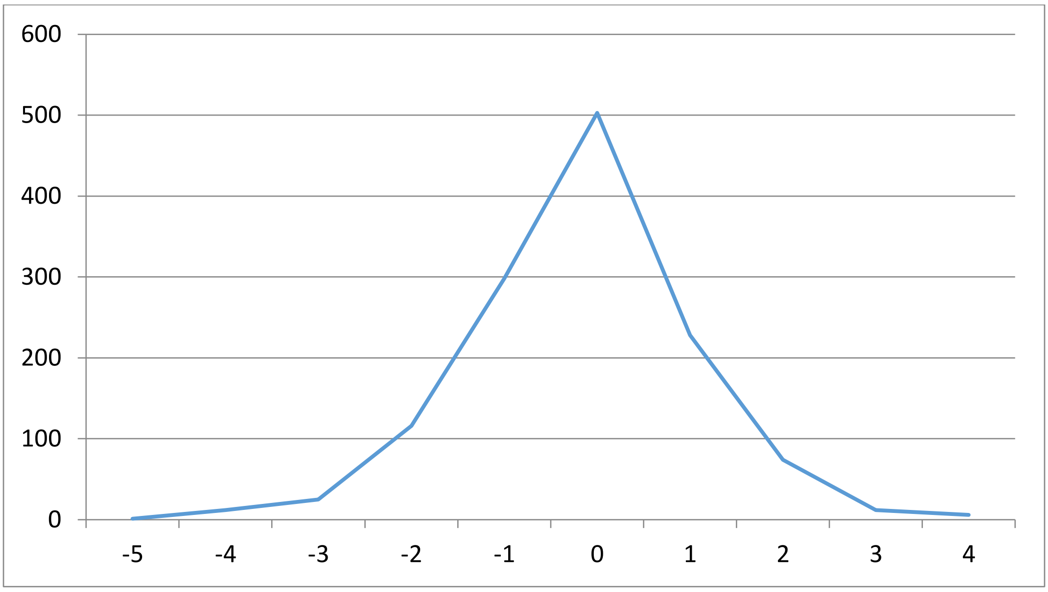


Fig. 10_4. The number of isotopes, depending on the magnitude of the deviation of the remaining mu-neutrinos in the same isotopes after the reactions β + decay and nr_ nucleosynthesis

According to the calculations, in 773 isotopes subject to the reactions of β+_decay in ST, the amount of mu-neutrinos remaining in the resulting isotope after the β+_decay reaction is insignificant (from -5 pieces to +4 pieces) differs from the number of mu-neutrinos remaining in a similar isotope formed after the nr_nucleosynthesis reaction.

In Fig. 10_4 is a graph of the number of such isotopes as a function of the deviation of the number of burst mu-neutrinos. The spread of the deviation value for the β+_decay reactions even decreased in comparison with the β-_decay reactions (from -7 pieces to +6 pcs.).

All this may be indirect, but also confirms the idea (model) of variable (in small limits) amounts of remaining mu-neutrinos in the same isotopes, especially in different batches that have a different "biography".

This model explains the discrepancy between the lists of ST and SM isotopes subject to the β+_decay reactions, or rather, it makes it possible to add these isotopes to the ST list with a certain reduced probability of realizing the β+_decay reactions.

The energy result of the β+_decay reactions.

The energy result of the reactions of β+_decay in SM [ECM = $(m_1-m_2) * c^2$] converges with the energy result of the β+_decay reactions in ST calculated by the S_ formula:

$E_{\beta+} = (N\nu\mu + u) - d - \Delta g_{SIF} - e+ + EPP = (N-5) * (\nu e + \gamma) + g_F + EPP$

The difference between this formula and the S_formula of the energy result of the β-_decay reactions is the presence of an additional term (EPP = e- + e+), which physically has three implementation options:

A) electron and positron annihilation (pure addition to the energy result of the β+_decay reaction);

B) the formation of an electron-positron pair in the form of connected with each other bagels, similarly to the formation of a mu-neutrino and a tau-neutrino of two positively and negatively charged simples-bagels;

B) the independent further existence of an electron and a positron outside the formed isotope.

S_ calculations show that the energy result of the β+_decay reactions is in the range from 1.448939 MeV (for the isotope 114In) to 22.765499 MeV (for the isotope 14F).

Isotopes subject to the reactions of β-_decay and β+_decay

Based on the calculation of the two types of β-_decay and β+_decay reactions, we have identified a list of isotopes that are subject to both of these reactions (see Table 19). For comparison, we give a table of such isotopes for SM (Table 20) from the source [12].

Table 19. Isotopes prone to reactions
β-_decay and β+_decay (according to S_theory)

Мнемокод1	Мнемокод2	Период полураспада
40K	19_21	1.248·10(9) лет
50V	23_27	140
64Cu	29_35	12.700 ч
74As	33_41	17.77 сут
78Br	35_43	6.46 мин
80Br	35_45	17.68 мин
84Rb	37_47	33.1 сут
98Tc	43_55	4.2(3)E+6 лет
102Rh	45_57	207.0 сут
108Ag	47_61	2.37 мин
112In	49_63	14.97 мин
114In	49_65	71.9 с
120Sb	51_69	15.89 мин
122Sb	51_71	2.7238 d
126I	53_73	12.93(5) сут
132Cs	55_77	6.480 сут
136La	57_79	9.87 мин
138La	57_81	1.02·10(10) лет
144Pm	61_83	363 сут
146Pm	61_85	5.53 лет
150Eu	63_87	36.9 лет
152Eu	63_89	13.537 лет
156Tb	65_91	5.35 сут
190Ir	77_113	11.78 сут
196Au	79_117	6.1669 сут

Table 20. Isotopes prone to reactions
β-_decay and β+_decay (by SM)

Мнемокод1	Мнемокод2	Период полураспада
40K	19_21	1.248·10(9) лет
44V	23_21	111 мс
50V	23_27	140
54Mn	25_29	312.03 сут
64Cu	29_35	12.700 ч
74As	33_41	17.77 сут
78Br	35_43	6.46 мин
80Br	35_45	17.68 мин
84Rb	37_47	33.1 сут
92Nb	41_51	34.7 млн. лет
102Rh	45_57	207.0 сут
104Rh	45_59	42.3 с
106Ag	47_59	23.96 мин
108Ag	47_61	2.37 мин
112In	49_63	14.97 мин
114In	49_65	71.9 с
122Sb	51_71	2.7238 d
126I	53_73	12.93(5) сут
128I	53_75	24.99(2) мин
130Cs	55_75	29.21 мин
132Cs	55_77	6.480 сут
138La	57_81	1.02·10(10) лет
152Eu	63_89	13.537 лет
154Tb	65_89	21.5 ч
156Tb	65_91	5.35 сут
158Tb	65_93	180 лет
168Tm	69_99	93.1 сут
196Au	79_117	6.1669 сут
212At	85_127	0.314(2) сек
224Ac	89_135	2.78(17) ч
230Pa	91_139	17.4 сут

Comparison of these two tables (lists of isotopes) gives the following result:
A) List_ST contains 25 isotopes, and list_CM - 31 isotopes.

B) Overlapping the lists of ST and SM is 18 isotopes (72% of ST and 58.1% of SM) - in the tables they are marked with a light brown color.
C) List ST contains 7 isotopes (28% of ST), which are not in the list of SM.
D) The list_SM contains 13 isotopes (41.9% of SM), which are not in the list ST.
The explanation of these lists can be exactly the same as in the case of the reactions of β+_decay and β-_decay. We will not repeat these explanations related to the probabilistic nature of the remaining in the isotope of mu-neutrinos. Let us turn your attention to something else. Applying both of the above tables 19 and 20 to the Mendeleyev table, we obtain a strictly regular picture of the elements containing isotopes subject to the reactions of β-_decay and β+_decay (see Fig. 10_5).
All elements containing isotopes that are subject to two types of β_decay reactions are located in the periodic table strictly periodically through one element horizontally (elements with an odd number of protons) and strictly vertically under each other. Moreover, isotopes (elements) from both tables, as it were, complement each other in the construction of the indicated regular picture (see Fig. 10_5).
In the periodic table in Fig. 10_5 elements marked in brown have isotopes included in both the ST table and the SM table. Elements marked in yellow have isotopes included in the ST table only. Elements marked in green have isotopes included in the SM table only.

Пери- -оды	Ря-- ды	группы химических элементов									
		I	II	III	IV	V	VI	VII	VIII		
I	1	1 H водород									2 He гелий
II	2	3 Li литий	4 Be бериллий	5 B бор	6 C углерод	7 N азот	8 O кислород	9 F фтор			10 Ne неон
III	3	11 Na натрий	12 Mg магний	13 Al алюминий	14 Si кремний	15 P фосфор	16 S сера	17 Cl хлор			18 Ar аргон
IV	4	19 K калий	20 Ca кальций	21 Sc скандий	22 Ti титан	23 V ванадий	24 Cr хром	25 Mn марганец	26 Fe железо	27 Co кобальт	28 Ni никель
		29 Cu медь	30 Zn цинк	31 Ga галлий	32 Ge германий	33 As мышьяк	34 Se селен	35 Br бром			36 Kr криптон
V	5	37 Rb рубидий	38 Sr стронций	39 Y иттрий	40 Zr цирконий	41 Nb ниобий	42 Mo молибден	43 Tc технеций	44 Ru рутений	45 Rh родий	46 Pd палладий
		47 Ag серебро	48 Cd кадмий	49 In индий	50 Sn олово	51 Sb сурьма	52 Te теллур	53 I иод			54 Xe ксенон
VI	6	55 Cs цезий	56 Ba барий	57 La лантан ×	72 Hf гафний	73 Ta тантал	74 W вольфрам	75 Re рений	76 Os осмий	77 Ir иридий	78 Pt платина
		79 Au золото	80 Hg ртуть	81 Tl таллий	82 Pb свинец	83 Bi висмут	84 Po полоний	85 At астат			86 Rn радон
VII	7	87 Fr франций	88 Ra радий	89 Ac актиний ××	104 Rf резерфордий	105 Db дубний	106 Sg сиборгий	107 Bh борий	108 Hs хассий	109 Mt мейтнерий	110 Ds дармштадтий
		111 Rg рентгений	112 Cn коперниций	113	114 Fl флеровий	115	116 Lv ливерморий	117			118

58 Ce церий	59 Pr празеодим	60 Nd неодим	61 Pm прометий	62 Sm самарий	63 Eu европий	64 Gd гадолиний	65 Tb тербий	66 Dy диспрозий	67 Ho гольмий	68 Er эрбий	69 Tm тулий	70 Yb иттербий	71 Lu лютеций
90 Th торий	91 Pa протактиний	92 U уран	93 Np нептуний	94 Pu плутоний	95 Am америций	96 Cm кюрий	97 Bk берклий	98 Cf калифорний	99 Es эйнштейний	100 Fm фермий	101 Md менделевий	102 No нобелий	103 Lr лоуренсий

Fig. 10_5. The Mendeleev Periodic Table with marked elements that contain isotopes that are subject to two types of β-_decay and β+_decay reactions

It should be noted that all isotopes in both tables have an even number of nucleons and an odd number of protons and neutrons.
For specialists dealing with the reactions of β_decay, there is probably nothing surprising in this. We have seen many articles in which, in analyzing the β_decay reactions, a great emphasis was placed on the even-odd number of protons and neutrons in the isotope subjected to the β_decay reaction. But, frankly, we perceived this statement as a purely mathematical combinatorial, correlating with experimental reactions, but never meted a physical model explaining this "phenomenon."
In the case of the correlation we have found, nuclear physics correlates with electronic physics. On the one hand, the purely nuclear property of these isotopes, consisting in an increased amount of the remaining mu-neutrinos, exceeding a minimum of 6 pcs. a similar amount of the remaining mu-neutrinos in neighboring isotopes located along the diagonal of β_reactions, both in both directions (peculiar "hempы" on the "deck of the rook"). On the other hand, the periodic properties of elements in the periodic table, determined by their electronic shells.
It is physically clear that these isotopes have some local maximum of the number of mu neutrinos ("hemps") remaining in them, and the location of these isotopes in the isotope cloud is gravitating towards main-stream, but only once coinciding with it (40K isotope). In other cases, the isotopes (β-)+(β+) are located in the closest cells of the cloud surrounding the isotopes, in which the main-stream makes a turn from horizontal to vertical or vice versa.
The periodic arrangement of these isotopes in the Mendeleyev table is formally connected with the fact that all these isotopes have an odd number of protons in their composition.
Moreover, a number of elements formally having the same periodicity in the Mendeleyev table (these are: Sc, Co, Ga, Y, Pr, Ho, Lu, Ta, Re, Tl, Bi, Fr, Np, Am, Bk, Es, Md, Lr, Db, Bh, Mt) did not enter either the experimental (SM) or the theoretical (ST) lists of elements containing isotopes (β-)+(β+) in their composition.
We failed to give a justified explanation of the correlation of the nuclear properties of the marked elements discovered by us and their periodic arrangement in the Mendeleyev table. One can only assume that this correlation is related to the multiplicity of the number of groups of chemical elements in the periodic table (8 group) and the form of nuclei discovered by us in the S-model of the nucleus structure by "beads" of 4 nucleons and "four-leaf " of 2 nucleons.
The correlation we found between the list of isotopes subject to the (β-) and (β+) decay reactions, with their periodic arrangement in the Mendeleyev table, obliges us to reconsider, our conclusion, the connection of the periodic properties of chemical elements in the periodic table only with charges (and masses) of their nuclei (see the formulation of the Antropic Principle, ed. 1 in Chapter 7).
Taking into account the observed new correlation, as well as all the processes of formation of simples, neutrinos, relic neutrons, nr_nucleosynthesis and its regularities that we analyzed earlier, we can formulate a generalized Antropic principle that unites and extends parts 1 and 2 of the Antropic principle formulated by us in Chapter 7 (Ed. 1).

Generalized Anthropic Principle (Ed.2)

The nuclear energy properties of isotopes and the chemical properties of their electron shells are determined by the physical parameters of their nuclei, such as the mass (the number of mu neutrinos), the charge and the frequency of location of protons and neutrons in the "sausage" of the nucleus.
The nuclear energy properties of isotopes, in turn, explain the admissible set of nuclear reactions of these isotopes and, ultimately, the energy of our Universe.
The chemical properties of the electron shells of isotopes, in turn, explain the permissible set of chemical and biochemical reactions of these isotopes and their compounds, and, ultimately, the basis of the evolution of matter.
The process of forming the spectrum of isotopes with the indicated nuclear and chemical properties was deterministic in nature, it is based on micro objects - simples consisting of electromagnetic vortices and having certain electromagnetic properties, capable of interacting and forming strictly defined blocks, aggregates and structures.

S_analysis of reactions of electron capture by an isotope core

In Fig. 10_6 represents the S_model of reactions K_capture.

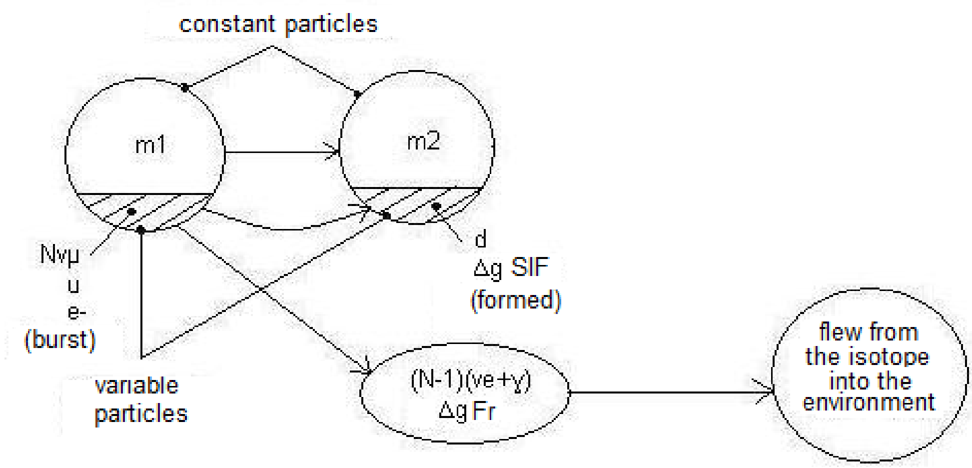


Fig. 10_6. S_model of reaction K_capture

The S_ formula for the capture of an electron by the nucleus of an isotope (Seventh version of mu-neutrino bursting) has the following minimal form (with a minimum number of bursting mu neutrinos of 2 pcs.):

u + e- + 2vμ → d + (4Su+ + 6Se- + 2 * Sμ+) → d + 2(ve + γ) + Δg_{SIF} + g_F + ΔVF

or p + e- → n + 2(ve + γ) + Δg_{SIF} + g_F + ΔVF

The minimum number of bursting mu-neutrinos is 2 pcs. It is necessary to form a quark d from two simples Sμ-. The question of the number of bursting mu-neutrinos will be considered later.

Physically, S_formula describes the process of "detachment" of a negatively charged electron with K_orbit by the electric field of a positively charged nucleus. The "blow" of the electron always has a positively charged quark u, which is "knocked out" of the "quark hoop", the electron's bagel busted and probably breaks into two blocks of simples-spirales. At the same time, at least two neighboring mu-neutrinos burst. Of the two negative simples of the mu-neutrino, a quark d (confinement) is formed, and all the remaining simples-spirales (indicated in the formula in brackets) annihilate with the formation of two pairs of electron neutrinos and gamma quanta (the number of pairs is determined by a set of spiral blocks). Gluons are formed from the flying turns of TEV.

For the minimal variant of the reaction K_capture (with two bursting mu neutrinos), the energy result EK (2), without taking into account the change in the mass (energy) of flagellum gluons_SIF and VP, will be:

EK (2) = e- + 4Su+ + 2vμ - 2Sd- = 0.89009786 MeV,

that approximately corresponds to the mass of two electrons.

However, in the described physical model of the K_capture reaction, one does not see any significant elements of the model that limit the number of bursting mu-neutrinos exactly 2 pcs. Yes, the kinetic and internal energy of an electron torn off from a K-orbit can be considered constant. But, knowing the structure of the nucleus in S_theory, it is difficult to assume that the variants of the collision of an electron with u_quark and the microexplosion occurring as a result of this collision will be exactly the same in all cases, and that exactly 2 pcs will burst. mu-neutrinos.

Therefore, the algorithm for calculating the isotopes subject to the reactions of the K_capture will be constructed in a general form, allowing for the bursting of N pcs. mu-neutrinos, and then we will return in addition to the question of the number of bursting mu-neutrinos.

The mass of the first (initial) isotope:

m_1 = [60vτ + N_1vμ + (2u + d)] + g_{SIF1} + e- + K + VP_1, where

the terms in square brackets are a proton that turns into a neutron in the course of the K_capture reaction,

N_1 is the number of mu-neutrinos in a given proton,

g_{SIF1} is the mass (energy) of all gluons-SIF in the nucleus of the initial isotope,

e- is an electron that is torn from the K-orbit,
K is the mass of all other nucleons and electrons of the initial isotope,
VF_1 is the mass of flagellums of the VP of the initial isotope (the ionization energy of all electrons).
The mass of the second (resulting) isotope will then be:
$m_2 = m_1$ - Nvμ - u + d + Δg_{SIF} - e- - ΔVF = [60vτ + (N_1-N) vμ + (u + 2d)] + g_{SIF2} + K + VP_2, where
The terms in square brackets represent the resultant neutron,
N is the total number of bursting mu-neutrinos in the course of the K_capture reaction,
g_{SIF2} is the mass (energy) of all gluons _SIF in the nucleus of the resulting isotope,
$g_{SIF2} = g_{SIF1} + \Delta g_{SIF}$, where Δg_{SIF} is the increase in mass (energy) of gluons_SIF during the reaction K_capture,
K is the mass of all other nucleons and electrons of the resulting isotope,
VF_2 is the mass of flagellums of the VP of the resulting isotope (the ionization energy of all electrons).
$VF_2 = VP_1$ - ΔVF, where ΔVF - decrease in mass (energy) of flagellums VP during the reaction K_capture (the number of electrons in the isotope decreases).
The mass defect of isotopes during the K_capture is:
m_2-m_1 = - Nvμ - u + d - e- + Δg_{SIF} - ΔVF, hence
Nvμ = - (m_2-m_1) - (u-d) - e- + Δg_{SIF} - ΔVF
Taking the gain of the mass of gluons Δg_{SIF} <vμ and ΔVF ~ 0, we obtain the following formula for calculating:
N (pcs) = INTEGER ((m_2-m_1) + (u-d) + e-) / vμ)

Note:
In the real calculation of the number of burst mu-neutrinos during the reactions of the K_capture we took into account two more limitations:
1) The mass of the second isotope can not be greater than the mass of the first isotope, so all pairs of isotopes in which the mass gain is positive are excluded during the calculation.
2) In accordance with S_formula of the reaction K_capture, the number of burst mu-neutrinos can not be less than 2 pcs. (for balancing the balance of simples).

Further, we calculate the number of remaining mu-neutrinos in the second isotope, taking the number of mu-neutrinos (N) that have bursted from the number of remaining mu-neutrinos in the first isotope, as well as the increase in the mass of gluons, the mass of gluons in the second isotope, and the change in the ionization energy of isotopes according to the following formulas:
$N_2 = N_1$-N
Δg_{SIF} = (m_2-m_1) + Nvμ
$g_{SIF2} = g_{SIF1} + \Delta g_{SIF}$
ΔVF = VP_1 - VP_2
The mass of gluons in the first isotope is taken from calculations of the isotope cloud in Chapter 6, and the ionization energy from the isotope reference book.
Finally, we compute the energy result (E_K) of the K_capture reactions, as the difference in mass (internal energy of the simples) of the bursted electron, mu-neutrino, and quark u, on the one hand, and the mass of the quark d formed and the increase in the mass of the gluon_SIF:
E_K = (Nvμ + u + e-) -d - Δg_{SIF} = (N-1) * (ve + γ) + g_F
The transition and distribution of this energy result to other types of energy of the nucleus of the new isotope and other formed particles is not considered by us.

The calculation results for the presented formulas, for the number of bursting mu-neutrinos equal to 2 pcs, gives the following list of isotopes subject to the reactions of K-capture (see Table 21).

Table 21. K_capture_ST (number of bursting mu-neutrinos = 2 pcs.)

The initial isotope (m1)	Resulting isotope (m2)	Defect of masses (m2 - m1))	The mu neutrino busted	Period half-life	Modes of decay
7Be	7Li	-0.85926982	2	53.22(6) сут	EC
37Ar	37Cl	-0.813874306	2	35.04(4) дня	EC
51Cr	51V	-0.752554052	2	27.7025 d	EC
57Co	57Fe	-0.83592277	2	271.74 сут	EC
75Se	75As	-0.863401845	2	119.779 сут	EC
110Ag	110Pd	-0.888645334	2	24.6 с	β− (99.7%) EC (.3%)
111In	111Cd	-0.861538857	2	2.8047 d	EC
122Xe	122I	-0.725633874	2	20.1 ч	β+
142Pr	142Ce	-0.745940444	2	19.12 ч	β− (99.98%) EC (.0164%)
154Eu	154Sm	-0.717157278	2	8.593 лет	β− (99.98%) EC (.02%)
155Tb	155Gd	-0.822509256	2	5.32 сут	EC
161Ho	161Dy	-0.858464927	2	2.48 ч	EC
158Er	158Ho	-0.886782346	2	2.29 ч	EC
167Tm	167Er	-0.748362329	2	9.25 сут	EC
164Yb	164Tm	-0.865357983	2	75.8 мин	EC
180Ta	180Hf	-0.852130767	2	8.152 ч	EC (86%) β− (14%)
176W	176Ta	-0.717250427	2	2.5 ч	EC
182Os	182Re	-0.838344655	2	22.10 ч	EC
192Hg	192Au	-0.764756624	2	4.85 ч	EC α (4×10−6%)
200Pb	200Tl	-0.804810869	2	21.5 ч	β+
211At	211Po	-0.785342643	2	7.214(7) часа	EC (58.2%) α (42%)
213Rn	213At	-0.881193382	2	19.5(1) мсек	α
220Fr	220Rn	-0.869083959	2	27.4 с	α (99.65%) β− (.35%)
219Ra	219Fr	-0.775934553	2	10 мс	α
239Am	239Pu	-0.802109536	2	11.9 ч	EC (99.99%) α (.01%)
242Am	242Pu	-0.75134311	2	16.02 ч	β− (82.7%) EC (17.3%)
241Cm	241Am	-0.767457957	2	32.8 сут	EC (99%) α (1%)
245Bk	245Cm	-0.810772431	2	4.94 сут	EC (99.88%) α (.12%)
244Cf	244Bk	-0.76382513	2	19.4 мин	α (99%) EC (1%)
250Fm	250Es	-0.84859109	2	30 мин	α (90%) EC (10%) SF (6.9×10−3%)

The list of K(2), let's call it so, includes 30 isotopes, which is much less than the number of isotopes subject to K_capture reactions, according to Wiki-2016 data, including 139 isotopes.

The verification of the isotopes Wiki-2016 (139 pcs.) For the number of mu neutrinos bursting in them according to the formulas derived by us showed that from 2 to 22 mu neutrinos burst in these isotopes. In Table. 22 shows a list of these isotopes, and Fig. 10_7 distribution of their number by the number of bursting mu-neutrinos.

Table 22. K_capture (Wiki-2016)

The initial isotope (m1)	Resulting isotope (m2)	Defect of masses (m2 - m1))	Defect of masses for calculating of bursting mu-neutrinos	The mu neutrino busted	Period half-life	Modes of decay
7Be	7Li	-0.85926982	-0.3408213	2	53.22(6) сут	EC
11C	11B	-1.982405661	-1.4639552	8	20.334(24) мин	β+ (99.79%) EC (.21%)[1][2]
18Ne	18F	-4.44341297	-3.9249522	22	1.672(8) с	Electron capture (EC) 2p (possibly 2He)[2]
37Ar	37Cl	-0.813874306	-0.2954194	2	35.04(4) дня	EC
40K	40Ar	-1.504695918	-0.9862524	6	1.248·10(9) лет	β− (89.28%) EC (10.72%) β+ (0.001%)[3]
41Ca	41K	-0.421314764	0.0971305	-	102 тыс. лет	EC
44Ti	44Sc	-0.267618244	0.2508277	-	60.0 лет	EC
49V	49Ti	-0.601838313	-0.0833924	-	329 сут	EC
51Cr	51V	-0.752554052	-0.2341081	2	27.7025 d	EC
53Mn	53Cr	-0.596808245	-0.0783616	-	3.74 млн. лет	EC
54Mn	54Cr	-1.377213969	-0.8587674	5	312.03 сут	EC 99.99% β− (2.9×10−4%) β+ (5.76×10−7%)

The initial isotope (m1)	Resulting isotope (m2)	Defect of masses (m2 - m1))	Defect of masses for calculating of bursting mu-neutrinos	The mu neutrino busted	Period half-life	Modes of decay
55Fe	55Mn	-0.231289975	0.2871571	-	2.737 лет	EC
57Co	57Fe	-0.83592277	-0.3174757	2	271.74 сут	EC
59Ni	59Co	-1.07280171	-0.5543547	3	76 тыс. лет	EC (99%) β+ (1.5x10−5%)[8]
67Ga	67Zn	-1.000797219	-0.4823521	3	3.2612 d	EC
70Ga	70Zn	-0.654560877	-0.1361157	-	21.14 мин	β− (99.59) EC (0.41%)
68Ge	68Ga	-0.106097174	0.4123499	-	270.95 сут	EC
71Ge	71Ga	-0.232594067	0.2858530	-	11.43 сут	EC
73As	73Ge	-0.341019976	0.1774290	-	80.30 сут	EC
76As	76Ge	-0.923483212	-0.4050342	3	1.0942 d	β− (99.98%) EC (.02%)
72Se	72As	-0.335337862	0.1831110	-	8.40 сут	EC
75Se	75As	-0.863401845	-0.3449529	2	119.779 сут	EC
81Kr	81Br	-0.28075231	0.2377009	-	2.29(11)·10(5) лет	EC
83Rb	83Kr	-0.907275215	-0.3888319	3	86.2 сут	EC
86Rb	86Kr	-0.518553429	-0.0001101	-	18.642 сут	β− (99.9948%) EC (.0052%)
82Sr	82Rb	-0.180150951	0.3382939	-	25.36 сут	EC
85Sr	85Rb	-1.064941763	-0.5464969	3	64.853 сут	EC
88Zr	88Y	-0.676171539	-0.1577255	-	83.4 сут	EC
91Nb	91Zr	-1.257703281	-0.7392572	4	680 лет	EC (99.98%) β+ (.013%)
93Mo	93Nb	-0.405106767	0.1133395	-	4.0 тыс. лет	EC
97Tc	97Mo	-0.31996821	0.1984782	-	2.6E+6 лет	EC
100Tc	100Mo	-0.168414126	0.3500323	-	15.8(1) с	β− (99.99%) EC (.0018%)
101Rh	101Ru	-0.542036394	-0.0235898	-	3.3 лет	EC
100Pd	100Rh	-0.357693719	0.1607538	-	3.63 сут	EC
103Pd	103Rh	-0.543061038	-0.0246135	-	16.991 сут	EC
110Ag	110Pd	-0.888645334	-0.3701986	2	24.6 с	β− (99.7%) EC (.3%)
109Cd	109Ag	-0.214243634	0.3042045	-	461.4 сут	EC
111In	111Cd	-0.861538857	-0.3430939	2	2.8047 d	EC
116In	116Cd	-0.469473007	0.0489719	-	14.10 с	β− EC
110Sn	110In	-0.631552973	-0.1131065	-	4.11 ч	EC
119Sb	119Sn	-0.590567235	-0.0721194	-	38.19 ч	EC
118Te	118Sb	-0.278516724	0.2399314	-	6.00 сут	EC
123I	123Te	-1.228640666	-0.7101911	4	13.2235(19) ч	EC
125I	125Te	-0.185833065	0.3326165	-	59.400(10) сут	EC
123Xe	123I	-2.694812318	-2.1763610	12	2.08 ч	EC
127Xe	127I	-0.662292277	-0.1438410	-	36.345 сут	EC
131Cs	131Xe	-0.355458134	0.1629849	-	9.689 сут	EC
134Cs	134Xe	-1.233274849	-0.7148318	4	2.0652 лет	β− EC (3×10−4%)
130Ba	130Cs	0.361605994	-	-	стабилен	Double EC
133Ba	133Cs	-0.517507361	0.0009370	-	10.51 лет	EC
137La	137Ba	-0.620933941	-0.1024892	-	60 тыс. лет	EC
134Ce	134La	-0.382844059	0.1356006	-	3.16 сут	EC
139Ce	139La	-0.27916877	0.2392759	-	137.641 сут	EC
142Pr	142Ce	-0.745940444	-0.2274959	2	19.12 ч	β− (99.98%) EC (.0164%)
140Nd	140Pr	-0.441528185	0.0769165	-	3.37 сут	EC
145Pm	145Nd	-0.163384058	0.3550607	-	17.7 лет	EC α (2.8×10−7%)
146Pm	146Nd	-1.470922272	-0.9524776	6	5.53 лет	EC (66%) β− (34%)
145Sm	145Pm	-0.615717574	-0.0972728	-	340 сут	EC
149Eu	149Sm	-0.695174018	-0.1767292	-	93.1 сут	EC
152Eu	152Sm	-1.8742592	-1.3558144	8	13.537 лет	EC (72.09%), β+ (0.027%) β− (27.9%)
154Eu	154Sm	-0.717157278	-0.1987125	2	8.593 лет	β− (99.98%) EC (.02%)
146Gd	146Eu	-1.029300937	-0.5108556	3	48.27 сут	EC
151Gd	151Eu	-0.463697744	0.0547476	-	124 сут	EC α (10−6%)
153Gd	153Eu	-0.483631716	0.0348136	-	240.4 сут	EC
155Tb	155Gd	-0.822509256	-0.3040642	2	5.32 сут	EC
157Tb	157Gd	-0.060081367	0.4583636	-	71 лет	EC
152Dy	152Tb	-0.603608152	-0.0851631	-	2.38 ч	EC (99.9%) α (.1%)
159Dy	159Tb	-0.36551827	0.1529268	-	144.4 сут	EC
161Ho	161Dy	-0.858464927	-0.3400197	2	2.48 ч	EC

The initial isotope (m1)	Resulting isotope (m2)	Defect of masses (m2 - m1))	Defect of masses for calculating of bursting mu-neutrinos	The mu neutrino busted	Period half-life	Modes of decay
163Ho	163Dy	-0.002515034	0.5159301	-	4.570 тыс. лет	EC
164Ho	164Dy	-0.986172762	-0.4677276	3	29 мин	EC (60%) β− (40%)
158Er	158Ho	-0.886782346	-0.3683371	2	2.29 ч	EC
160Er	160Ho	-0.329748898	0.1886964	-	28.58 ч	EC
165Er	165Ho	-0.376230451	0.1422148	-	10.36 ч	EC
167Tm	167Er	-0.748362329	-0.2299170	2	9.25 сут	EC
170Tm	170Er	-0.314006648	0.2044387	-	128.6 сут	β− (99.86%) EC (.14%)
164Yb	164Tm	-0.865357983	-0.3469126	2	75.8 мин	EC
166Yb	166Tm	-0.305530052	0.2129154	-	56.7 ч	EC
169Yb	169Tm	-0.909790249	-0.3913448	3	32.026 сут	EC
173Lu	173Yb	-0.670489425	-0.1520448	-	1.37 лет	EC
170Hf	170Lu	-1.057245759	-0.5387991	3	16.01 ч	EC
172Hf	172Lu	-0.33720085	0.1812458	-	1.87 лет	EC
179Ta	179Hf	-0.105631427	0.4128156	-	1.82 лет	EC
180Ta	180Hf	-0.852130767	-0.3336837	2	8.152 ч	EC (86%) β− (14%)
176W	176Ta	-0.717250427	-0.1988033	2	2.5 ч	EC
178W	178Ta	-0.091286418	0.4271607	-	21.6 сут	EC
181W	181Ta	-0.187416605	0.3310305	-	121.2 сут	EC
183Re	183W	-0.556101954	-0.0376549	-	70.0(14) д	EC
186Re	186W	-0.579389306	-0.0609423	-	3.7186(5) д	β− (93.1%) EC (6.9%)
182Os	182Re	-0.838344655	-0.3198970	2	22.10 ч	EC
185Os	185Re	-1.012813493	-0.4943658	3	93.6 сут	EC
189Ir	189Os	-0.532348856	-0.0139006	-	13.2 сут	EC
192Ir	192Os	-1.047278773	-0.5288305	3	73.827 сут	β− (95.24%) EC (4.76%)
188Pt	188Ir	-0.504869781	0.0135783	-	10.2 сут	EC (99.99%) α (2.6×10−5%)
191Pt	191Ir	-1.008808068	-0.4903600	3	2.862 сут	EC
193Pt	193Ir	-0.056821138	0.4616269	-	50 лет	EC
195Au	195Pt	-0.226818804	0.2916296	-	186.098 сут	EC
192Hg	192Au	-0.764756624	-0.2463070	2	4.85 ч	EC α (4×10−6%)
194Hg	194Au	-0.068930561	0.4495190	-	444 года	EC
197Hg	197Au	-0.600161623	-0.0817120	-	64.14 ч	EC
201Tl	201Hg	-0.481302981	0.0371423	-	72.912 ч	EC
204Tl	204Hg	-0.344280205	0.1741651	-	3.78 лет	β− (97.1%) EC (2.9%)
201Pb	201Tl	-1.92446673	-1.4060202	8	9.33 ч	EC (99%) β+ (1%)
202Pb	202Tl	-0.049369185	0.4690774	-	52.5 тыс. лет	EC (99%) α (1%)
203Pb	203Tl	-0.975087983	-0.4566414	3	51.873 ч	EC
205Pb	205Tl	-0.050580128	0.4678665	-	15.3 млн. лет	EC
211At	211Po	-0.785342643	-0.2668943	2	7.214(7) часа	EC (58.2%) α (42%)
216At	216Po	-0.473198983	0.0452494	-	0.30(3) ms	α (99.99%) β− (.006%) EC (3×10−7%)
216Ra	216Fr	-0.31205051	0.2063939	-	182 нс	α EC (1×10−8%)
223Ac	223Ra	-0.59131243	-0.0728681	-	2.10(5) мин	α (99%) EC (1%) CD (3.2×10−9%)
226Ac	226Ra	-0.641054213	-0.1226099	-	29.37(12) ч	β− (83%) EC (17%) α (.006%)
220Th	220Ac	-0.91752165	-0.3990764	3	9.7(6) мкс	α EC (2×10−7%)
222Th	222Ac	-0.581252294	-0.0628071	-	2.05(7) мс	α EC (1.3×10−8%)
225Th	225Ac	-0.671607218	-0.1531620	-	8.72(4) мин	α (90%) EC (10%)
227Pa	227Th	-1.025481812	-0.5070368	3	38.3 мин	α (85%) EC (15%)
229Pa	229Th	-0.311864212	0.2065808	-	1.50 сут	EC (99.52%) α (.48%)
232Pa	232Th	-0.499932863	0.0185122	-	1.31 сут	β− EC (.003%)
228U	228Pa	-0.300872582	0.2175728	-	9.1(2) мин	α (95%) EC (5%)
231U	231Pa	-0.381912565	0.1365328	-	4.2(1) сут	EC α (.004%)
235Np	235U	-0.124261308	0.3941841	-	396.1 сут	EC α (.0026%)

The initial isotope (m1)	Resulting isotope (m2)	Defect of masses (m2 - m1))	Defect of masses for calculating of bursting mu-neutrinos	The mu neutrino busted	Period half-life	Modes of decay
236Np	236U	-0.933357049	-0.4149117	3	154 тыс. лет	EC (87.3%) β− (12.5%) α (.16%)
232Pu	232Np	-1.003219104	-0.4847739	3	33.7(5) мин	EC (89%) α (11%)
234Pu	234Np	-0.393090494	0.1253547	-	8.8(1) ч	EC (94%) α (6%)
237Pu	237Np	-0.220112047	0.2983332	-	45.2(1) сут	EC α (.0042%)
239Am	239Pu	-0.802109536	-0.2836644	2	11.9 ч	EC (99.99%) α (.01%)
242Am	242Pu	-0.75134311	-0.2328980	2	16.02 ч	β− (82.7%) EC (17.3%)
238Cm	238Am	-0.978068764	-0.4596235	3	2.4 ч	EC (90%) α (10%)
240Cm	240Am	-0.213777887	0.3046674	-	27 сут	α (99.5%) EC (.5%) SF (3.9×10−6%)
241Cm	241Am	-0.767457957	-0.2490127	2	32.8 сут	EC (99%) α (1%)
243Cm	243Am	-0.007451952	0.5109933	-	29.1 лет	α (99.71%) EC (.29%) SF (5.3×10−9%)
245Bk	245Cm	-0.810772431	-0.2923270	2	4.94 сут	EC (99.88%) α (.12%)
244Cf	244Bk	-0.76382513	-0.2453796	2	19.4 мин	α (99%) EC (1%)
246Cf	246Bk	-0.126031146	0.3924144	-	35.7 ч	α EC (5×10−4%) SF (2×10−4%)
247Cf	247Bk	-0.646456878	-0.1280113	-	3.11 ч	EC (99.96%) α (.04%)
251Es	251Cf	-0.377255095	0.1411906	-	33 ч	EC (99.51%) α (.49%)
252Es	252Cf	-1.261242959	-0.7427973	4	471.7 сут	α (76%) EC (24%) β− (.01%)
254Es	254Cf	-0.651114349	-0.1326687	-	275.7 сут	α EC (10−4%) SF (3×10−6%) β− (1.74×10−6%)
250Fm	250Es	-0.84859109	-0.3301453	2	30 мин	α (90%) EC (10%) SF (6.9×10−3%)
253Fm	253Es	-0.33561731	0.1828285	-	3.00 сут	EC (88%) α (12%)

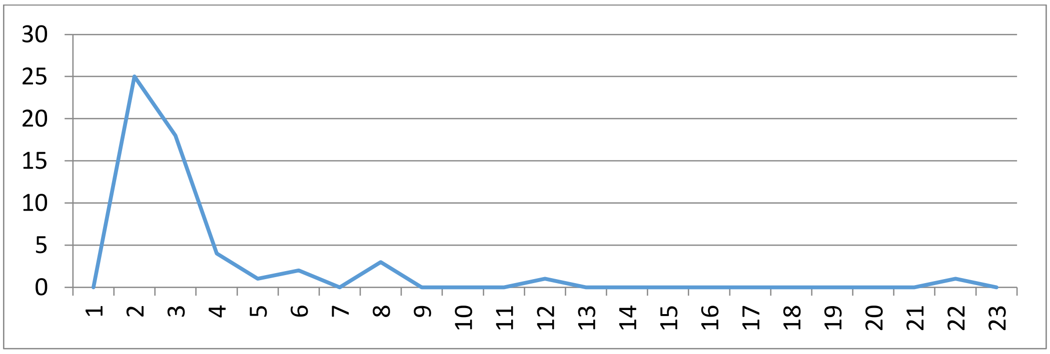


Fig. 10_7. The distribution of K_capture isotopes (Wiki-2016) over the range the number of bursting mu-neutrinos

As can be seen from Table. 22, the defect of the reference isotope masses of the K_capture susceptible to the K_capture reaction from the Wiki-2016 list is not equal to const, which, according to calculations (and common sense), indicates a different number of mu-neutrinos bursting in them (and, naturally, a the different energy results of the reactions). Below we present the results of a theoretical calculation of the K_capture isotopes for the range of bursting mu-neutrinos from 2 to 22 pcs mu-neutrinos, as in the Wiki-2016 list, see Fig. 10_8 (a), and also for the range from 2 to 120 pcs mu-neutrinos, the maximum permissible according to our calculations, see Fig. 10_8 (b). Calculation for the first range (2-22) gives us a list of 558 isotopes, and the calculation for the second range (2- 120) gives us a list of 1375 isotopes. We give graphs of the distribution of the number of isotopes in the indicated ranges of the number of burst mu-neutrinos (see Fig. 167).

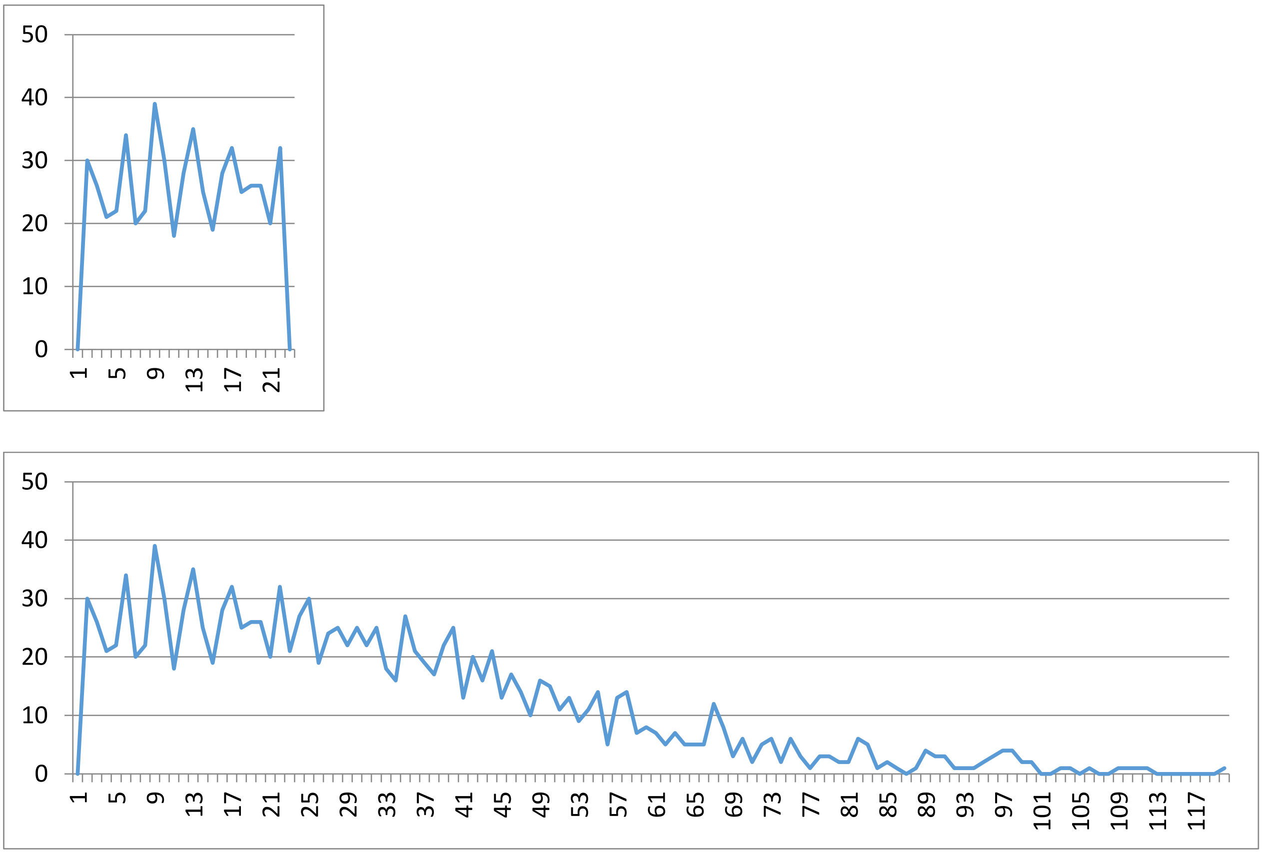


Fig. 10_8. K_capture isotope distribution (calculation_ST) for ranges the number of bursting mu-neutrinos (a) = (2-22) and (b) = (2-120) pcs.

As we see, the theoretical calculation using the S_theory formulas significantly expands the list of isotopes subject to K_capture reactions. Why is this not observed in experiments? It seems to us that the K_capture reactions with an increased number of bursting mu-neutrinos are "intercepted" by other "related" nuclear reactions, for example, β+_decay. The result of the reactions of K_capture are isotopes that precede the original isotope according to the periodic table, as well as in the reactions of β+_decay.
Table 22 also shows that 10 brown isotopes out of 139 have a positive mass defect (the mass of the resulting isotope is greater than the mass of the initial isotope), which can not be in accordance with the law of conservation of energy. In the table, these isotopes are colored with a light brown color.
Another 74 isotopes have a mass defect less than the mass of the electron, which indicates that the mass of the nuclei of these isotopes has grown, which also can not be without the addition of other nucleons. In the table, these isotopes are colored with a light green color.
The last two remarks, as we noted earlier, indicate the probabilistic nature of the reference isotope masses, and that, with a certain combination of them, the range of isotopes subject to K-capture reactions can be increased.
Let us verify this by comparing the amount of the remaining mu-neutrinos in the isotope after the K-capture reaction with an analogous amount of the remaining mu neutrinos in the isotope after the nr-nucleosynthesis reaction. The discrepancy of this quantity in 411 isotopes lies in the range from -5 to +5 mu-neutrinos. In Fig. 10_9 shows the distribution of isotopes of K_capture in the indicated range of discrepancies in the number of remaining mu-neutrinos.

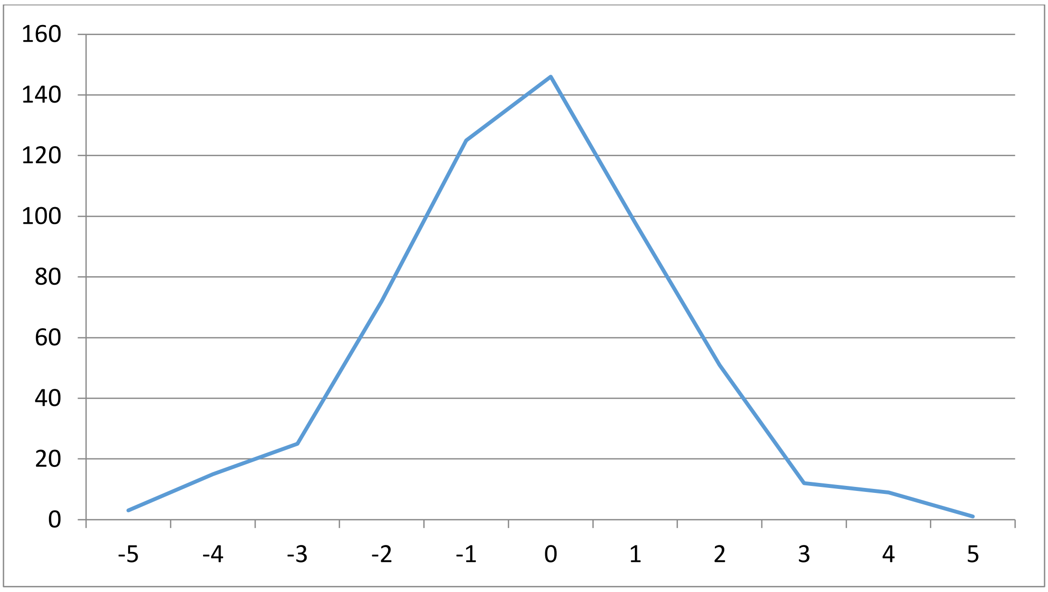


Fig. 10_9. The distribution of K_capture isotopes along the range of discrepancies in the number of remaining mu-neutrinos with similar isotopes of nr_nucleosynthesis

If we assume that the energies of the "micro explosion" from the collision and busting of the electron and u_quark can suffice to burst the number of mu-neutrinos from 2 to 22 pcs. (as in the calculations of the experimental K_capture reactions), then the "nominal" list(+,+) of coinciding reactions in ST and Wiki-2016 includes 55 green isotopes (see Table 22).
The list(+,-) for ST(+), and Wiki-2016(-) includes 502 isotopes (we do not give it).
The list(-,+) for ST(-), and Wiki-2016(+) includes 84 isotopes (see Table 22).
The lists(+,-) and (-,+) are explained by the probabilistic nature of the number of bursting mu-neutrinos for all nuclear reactions (see the hypothesis of the mass divergence of identical isotopes).
The energy result of the K_capture reactions for these isotopes (for the range 2-22) calculated from the ST_formula derived by us is in the range from 0.71715728 MeV (in 154Eu) to 4.59785469 MeV (in 211Fr), which corresponds completely to the energy of the K_capture for these isotopes calculated by the formula $E = (m_1-m_2) * c^2$ for masses of isotopes expressed in SI units, or $E = m_1-m_2$ for masses of isotopes expressed in MeV.
This concludes our analysis of the K-capture reactions.

S_analysis of the reactions of α_decay of isotopes

Model of α decay reactions.
According to the information from the literature, the α_decay reactions are not associated with external impact on isotopes or the influence of temperature. This means that the "trigger" of the reactions of α decay is the internal processes taking place in the isotopes, namely, the spontaneous bursting of mu-neutrinos in the compressed state.
How many mu neutrinos burst with the α decay reactions?
In the reactions of α decay, there is no destruction and formation of quarks (confinement), nor are electrons nor are positrons formed. From this we make a purely theoretical assumption that for the realization of the decay α_decay, it is sufficient to busting only one mu-neutrino.
Why is the tearing of the 1st mu-neutrino sufficient for α decay?
The question arises, how can the bursting of just one mu-neutrino lead to the detachment of 4 nucleons (α particles)? In our opinion, the physical model of the "whip" is applicable here.
The kernel, according to S_theory, has a linear structure ("sausage" or chain "beads", twisted into "bend" and "tangle"). The bursting at least one mu-neutrino next to the through flagellums of gluons_SIF , which pulls together all nucleons of the nucleus, causes in the through harness a perturbation that is transmitted along the harness and at its free end leads to the "whip" effect (see Figure 10_10).

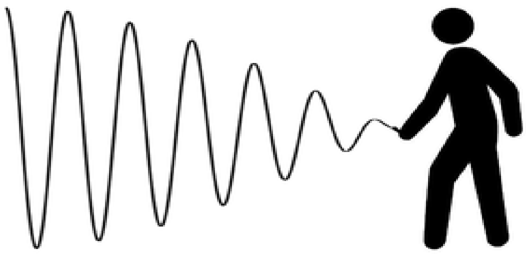


Fig. 10_10. Whiplash blow

We will not representthe full theory of "whip", we confine ourselves to stating the result. An effective blow of a whip leads to the detachment of its elements at the endof the "whip".
Similarly, a traveling wave of disturbance along the cantilever through flagellums of gluons_SIF leads to an increased effect on the last "bead" of the nucleus (α_particle) and its detachment.
An additional confirmation of the similarity of these two processes is the similarity of the graph in Fig. 10_10 and the graph of the initial number of bursting mu neutrinos in the main-stream nucleon chain during the formation of the "sausage" of isotope nuclei, see Fig. 10_11.

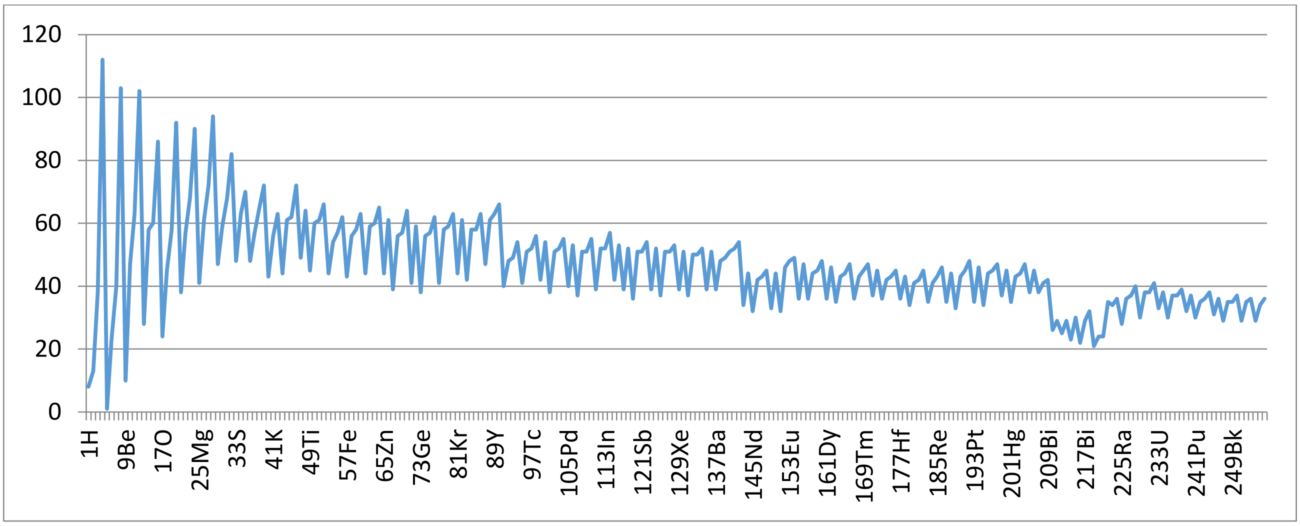


Fig. 10_11. The number of burst mu-neutrinos at the formation of isotopes.

In itself, the similarity of the charts of the "whip blow" and the number of mu-neutrinos that have burst is still not talking about anything.
But we can state that the averaged number of mu neutrinos that burst when the isotopes are formed are constantly decreasing. This means that in the initial part of the chain of nucleons an increased number of "holes" was formed, permeated with a large number of flagellums of gluons_SIF . This means that the perturbation wave from the bursting mu-neutrinos will "run" along the path of least resistance towards the beginning of the "sausage" on which the α_particle is located.
The proposed model of α_decay reactions is based on the assertion that the nuclei grow in one direction. We promised that in considering the reactions of α decay, we will confirm this assumption, which we will now try to do.

<u>In which direction do the nuclei grow and from which end of the nucleus does the α-particle come off?</u>
Theoretically, an α-particle or individual nucleons (p decay or n-decay) can be detached from both ends of the "sausage" of the nucleus.

In Chapter 5, when modeling the shape of nuclei, we made the assumption that all nuclei grow in one direction (nucleon 1-nucleon2-nucleon3- ... etc.). It was based on the fact that when assembling the nucleus of deuterium was be two nucleons with different rigidity are connected: a "soft" reference proton (53 mu-neutrinos) and the most rigid relic neutron (61 mu neutrinos). Because of this, with the contraction of their "quark hoops" (slot magnets), the proton deforms more and an additional 12 mu neutrinos (remnant = 41 mu-neutrinos) burst in it, and in the neutron only 1 mu-neutrino (remnant = 60 mu-neutrino-reference neutron).
As a result of the greater deformation of the proton (see Figure 5_4), the "petals" of its tau neutrinos go behind one another and block the channels for the exit of the flagellums of gluons_SIF beyond the nucleus. Further mooring of relic neutrons from this side of the nucleus (proton 1H) becomes impossible and the growth of nuclei continues only from the side of the neutron.
This means that at the given end of the nucleus an α_particle is formed (the stable 4He nucleus, which, when formed along the 1H-2H-3He-4He chain, has the following pnpn nucleon structure, which is a "double clamps ", and therefore has a maximum compression ratio, and maximum strength).
That's why in many nuclear reactions very often α-particles come off, because they themselves have a very high strength and that to break them you must put a lot of energy.
By the way, three more next fours ("beads") of stable nuclei, namely 5He-6Li-7Li-8Be, 9Be-10B-11B-12C, 13C-14N-15N-16O, have a nucleon structure of npnp, also representing " double clamps. " But between all these "beads" there are "waistbands" with an increased distance between the quark hoops of neighboring nucleons, and, as a consequence, a reduced level of coupling of nucleons. That is why, with a particularly strong "whip blow", these "beads" - fours of nucleons identical to α-particles (4He nuclei) can be detached. If the "blow" from the mu-neutrino bursting was particularly strong (more mu-neutrinos burst), then two "beads" (α1 and α2 = double α_ decay) can come off. Theoretically, 3-and 4-th "beads" can also come off, i.e theoretically possible reactions of both triple and quadruple α_decay (α1, α2, α3 and α1, α2, α3, α4), but we did not find any experimental data on such reactions.
An additional argument for the formation of α particles at only one end of the nucleus (at the beginning of the "sausage", and therefore of the one-sided growth of the nuclei, is based on data on the process of nr_ nucleosynthesis of the isotope cloud.
In Fig. 10_12 is a diagram of an isotope cloud with a mark of isotopes subject to the α_decay reactions on the basis of Wiki-2016 data. These isotopes are painted blue and yellow in the diagram.

Fig. 10_12. The reactions of α_decay (part 1)

p\n	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
1	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)																																		
2		(-)(-)	(-)(-)	(-)(-)	(-)(+)	(-)(-)	(-)(-)	(-)(-)	(-)(-)																																
3		(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(+)	(-)(-)																															
4		(-)(-)	(-)(-)	(-)(-)	(+)(+)	(-)(-)	(-)(-)	(-)(+)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)																												
5		(-)(-)	(-)(-)	(-)(+)	(+)(-)	(-)(-)	(-)(-)	(-)(+)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)																										
6			(-)(-)	(-)(+)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)																								
7				(-)(-)	(-)(-)	(-)(+)	(-)(-)	(-)(-)	(-)(-)	(-)(+)	(-)(+)	(-)(+)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)																						
8					(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)																								
9						(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)																		
10							(-)(-)	(-)(+)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)																
11								(-)(-)	(-)(-)	(-)(+)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(+)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)														
12								(-)(-)	(-)(-)	(-)(+)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)												
13									(-)(-)	(-)(-)	(-)(-)	(-)(+)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)											
14									(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)										
15										(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(+)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)									
16											(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)							
17												(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(+)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)						
18													(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)					
19														(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(+)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)				
20															(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)			
21																(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(+)	(-)(-)	(-)(-)	(+)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	
22																	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(+)(-)	(+)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)
23																		(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(+)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)
24																			(-)(-)	(-)(+)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)
25																				(-)(-)	(-)(-)	(-)(+)	(-)(-)	(-)(+)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)
26																				(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)
27																					(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(+)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)
28																					(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)
29																								(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)
30																									(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)
31																										(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)
32																											(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)
33																												(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)
34																																(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)
35																																	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)
36																																		(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)
37																																			(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(+)	(+)(-)
38																																				(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)
39																																						(+)(-)	(+)(-)	(+)(-)	(+)(-)
40																																							(+)(-)	(+)(-)	(+)(-)
41																																									(+)(-)

Fig. 10_12. The reactions of α_decay (part 2)

p\n	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
22	(-)(-)																																							
23	(-)(-)	(-)(-)																																						
24	(-)(-)	(-)(-)	(-)(-)																																					
25	(-)(-)	(-)(-)	(-)(-)	(-)(-)																																				
26	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)																																		
27	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)																																
28	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)																														
29	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)																													
30	(+)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)																											
31	(+)(-)	(+)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)																									
32	(+)(-)	(+)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)																							
33	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)																					
34	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)																				
35	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(+)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)																		
36	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(+)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)																
37	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(-)(-)	(-)(-)	(-)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)															
38	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(-)(-)	(-)(-)	(-)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)													
39	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(-)(-)	(-)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)											
40	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)										
41	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)								
42	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)							
43		(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)					
44			(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)				
45				(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)			
46					(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)		
47						(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)
48							(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(+)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)
49								(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)
50									(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)	(-)(-)
51												(+)(-)	(+)(+)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(-)(-)	(-)(-)
52													(+)(-)	(+)(+)	(+)(+)	(+)(+)	(+)(+)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)
53															(+)(+)	(+)(+)	(+)(+)	(+)(+)	(+)(+)	(+)(+)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)
54																(+)(+)	(+)(+)	(+)(+)	(+)(+)	(+)(-)	(+)(+)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)
55																	(+)(+)	(+)(-)	(+)(+)	(+)(-)	(+)(+)	(+)(-)	(+)(+)	(+)(+)	(+)(+)	(+)(-)	(+)(+)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)
56																		(+)(+)	(+)(-)	(+)(-)	(+)(+)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)
57																				(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)
58																					(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)
59																						(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)
60																								(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)
61																									(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)
62																										(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)
63																											(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)
64																														(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(+)	(+)(-)
65																															(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)
66																																(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)
67																																	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)
68																																			(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)
69																																				(+)(-)	(+)(-)	(+)(-)	(+)(-)	(+)(-)
70																																						(+)(-)	(+)(-)	(+)(-)
71																																							(+)(-)	(+)(-)

Fig. 10_12. The reactions of α_decay (part 3)

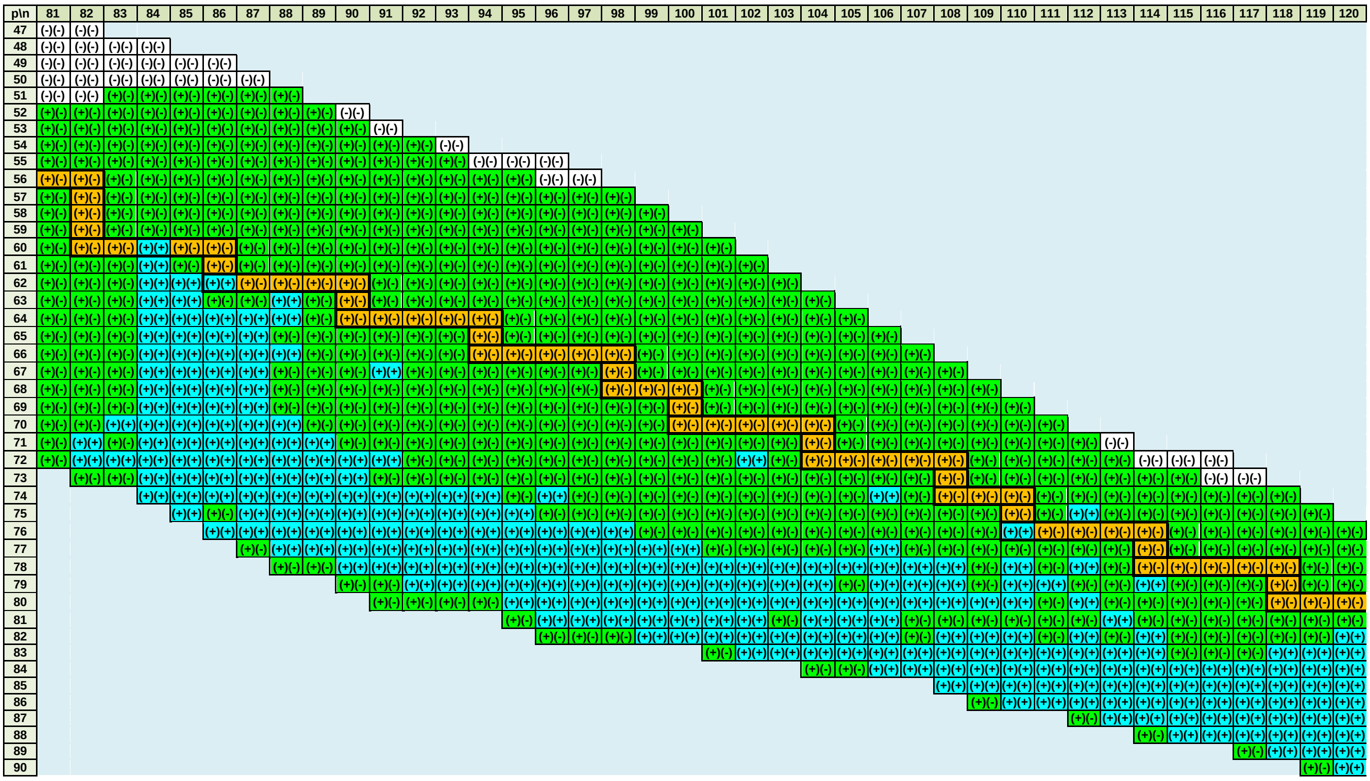
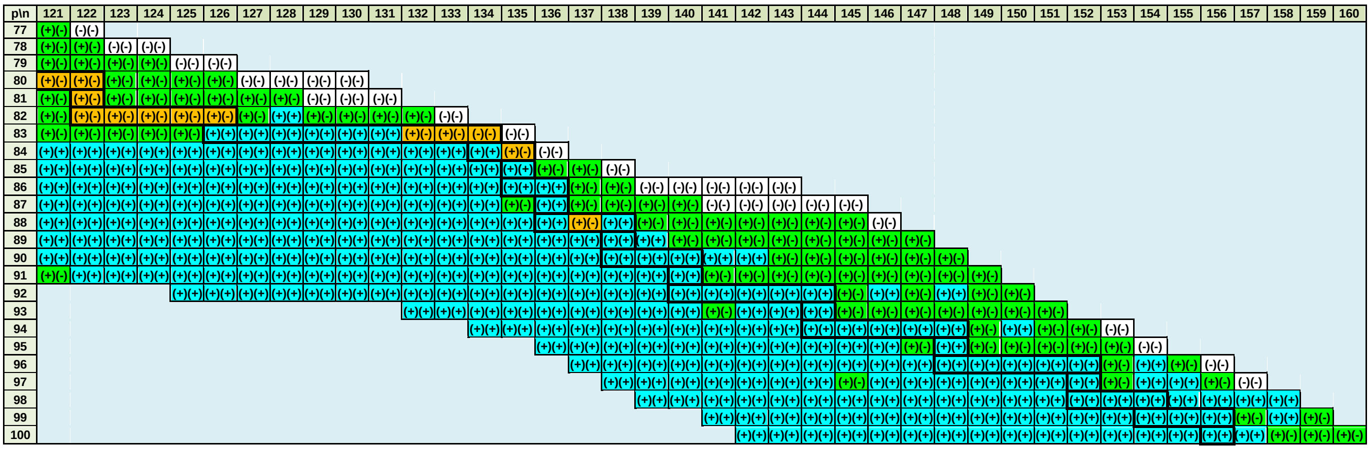


Fig. 10_12. The reactions of α_decay (part 4)



It is seen from the diagram that at the end of the isotope cloud, most isotopes are subject to the α_decay reactions, they form a literally continuous array of isotopes. And the growth of nuclei in this part of the cloud is mainly due to the predominant formation of neutrons. This means that here isotopes can not all have "beads" that are multiples of four and have a structure of α particles with a strict alternation of nucleon species, such as p-n-p-n or n-p-n-p.

From all this it follows that the growth of nuclei goes one-sided, and in the reactions of α_decay of isotope nuclei, the α particles formed at the beginning of the nucleus come off.

<u>S_formula of the reaction of α_decay.</u>

As the S_formula, for the reactions of α decay, we can use the second version of mu neutrino bursting, in which the mu neutrinos burst "far" from the "quark hoop" without destroying the last (no confinement):

$N\nu\mu \rightarrow N(\nu e + \gamma) + \Delta g_{SIF} + g_F + \Delta VF$, where N>= 1

In the case of the α_decay reactions, it is assumed that the mu-neutrino burst occurs near flagellums of gluons_SIF, passing across the entire nucleus , reaching up to the α particle located at the beginning of the nucleus of the isotope.

Calculation of the reactions of α decay.

In Fig. 10_13 represents the physical S_model of the α_decay reaction.

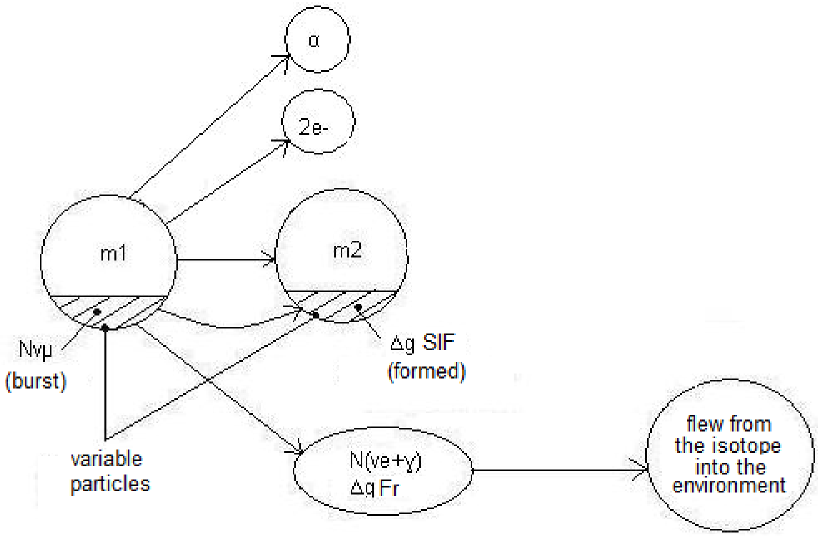


Fig. 10_13. S_model of the α_ decay reaction

The designations of the components in the figure correspond to those previously adopted in our work, the composition of some of them is disclosed below.

The mass of the first (initial) isotope (m1) in S_theory:

$m_1 = [A * 60\nu\tau + N_1\nu\mu + q_1 + g_{SIF1}] + e\text{-}_1 + VP_1$, where

The square brackets indicate the components related to the nucleus of the initial isotope,

A is the number of nucleons in the initial isotope,

N_1 is the number of mu neutrinos in the initial isotope,

q_1 - the mass of all quarks of the initial isotope,

g_{SIF1} is the mass (energy) of all gluons_SIF in the nucleus of the initial isotope,

$e\text{-}_1$ is the mass of all the electrons of the initial isotope,

VF_1 is the mass of flagellums of the VP of the initial isotope (the ionization energy of all electrons).

All the indicated isotope parameters are known to us from the calculation of the process of nr_ nucleosynthesis of the isotope cloud.

Mass of α particle by S_theory (α):

In Chapter 4 we noted that the mass of α particles is different for different isotopes. We calculated that the maximum mass of α particles in the 4He isotope (3727.3791377 MeV, 73 mu neutrinos, the mass (energy) of the gluons_SIF is equal to 0.1363192 MeV) and then, as a result of the additional mu neutrino bursting during nr_nucleosynthesis, decreases to 3720.69933741 MeV for the 56Fe isotope (36 mu-neutrinos, the mass (energy) of the gluons_SIF is 0.33213151 MeV). Further, for all isotopes, in which the number of nucleons is more than 56 pcs, the mass of α particles, the number of mu neutrinos, and the mass (energy) of gluons_SIF in them is conserved.

We do not know exactly how the α-particle parameters (mass, N, gSIF) behave in the interval from A = 4 to A = 56. These data on the results of the calculation of the process of nr_nucleosynthesis are known to us only for each isotope as a whole (including their α particles).

But we know the boundary values of the parameters of the α particles for A = 4 and A = 56. Not being able to calculate the actual values of these parameters for α-particles for each isotope, we take the approximating values of these parameters for calculations by choosing the simplest approximation law-a linear function of the α-particle parameters in the range from A = 4 to A = 56. Then for isotopes in this interval, the parameters of α particles can be calculated by the following formulas:

Δα = 3727.37912377-3720.69933741 = 6.679786361 MeV

α_A = 3720.69933741 + $\Delta\alpha$ * (56-A) / 52 MeV
ΔN_α = 73 - 36 = 37 (mu neutrinos)
$N_{\alpha A}$ = WHOLE (36 + 37 * (56-A) / 52) (mu neutrinos)
$\Delta g_{SIF\alpha}$ = 0.33213151 - 0.13623192 = 0.195899589 MeV
$g_{SIF\alpha A}$ = 0.1363192 + $\Delta g_{SIF\alpha}$ * (A-4) / 52 MeV
All the indicated parameters of α-particles will be needed for calculating the reactions of α decay in an isotope cloud.
The mass of the second (resulting) isotope (m2) according to S_theory:
The mass of the second (resulting) isotope, after the reaction of α decay, then will be equal to:
$m_2 = m_1 - N\nu_\mu - \alpha + \Delta g_{SIF} - 2e- - \Delta VF$, where
N is the total number of bursting mu-neutrinos in the course of the α decay reaction, N> = 1,
α is the mass of the α particle,
g_{SIF2} is the mass (energy) of all gluons _SIF in the nucleus of the resulting isotope,
Δg_{SIF} is a part of the mass of the burst mu-neutrinos, which remained in the nucleus of the resulting isotope in the form of a gain in the mass (energy)
ΔVF - change in mass (energy) of flagellum VP during the reaction ($\Delta VF = VP_1 - VP_2$).
In the equation for the mass of the second isotope, there are two unknown terms, which we must determine (N and Δg_{SIF}).
Calculation of N and Δg_{SIF}
To calculate N and Δg_{SIF}, we use the methodwe worked out, taking into account that N is an integer, and Δg_{SIF} is the difference in the mass and mass defect of the burst mu-neutrinos.
Then, knowing that $\Delta g_{SIF} < \nu_\mu$, we calculate the mass defect for calculating N:
$\Delta m = (m_1 - m_2) - \alpha - 2e- - \Delta VF$, then
$N_{fraction} = \Delta m / \nu_\mu$
N_{whole} = WHOLE ($N_{fraction}$) +1 (pcs.)
$\Delta g_{SIF} = N\nu_\mu - \Delta m$
Further, we calculate the number of remaining mu-neutrinos and the mass of gluons_SIF in the resulting isotope:
$N_2 = N_1 - N - N\alpha$
$g_{SIF2} = g_{SIF1} - g_{SIF\alpha} + \Delta g_{SIF}$
We take the mass of gluons in the first isotope (g_{SIF1}) from calculations of the isotope clouds in Chapter 6.
And finally, calculate the energy result (E_α) of reactions in S_theory and the Standard Model without taking into account the change in the mass (energy) of flagellums VP:
$E_{\alpha\,(ST)} = N\nu_\mu - \Delta g_{SIF}$
$E_{\alpha\,(SM)} = m_1 - m_2 - \alpha - 2e-$
Not being able to present the results of calculations in a tabular form, we note that the energy result calculated by the above formulas is completely identical.
The transition and distribution of this energy result to other types of energy of the core of a new isotope and other formed particles is not considered by us.

Notes:
In calculating the number of burst mu-neutrinos in the course of the α_decay reactions, we additionally took into account the following limitations:
a) The mass of the second isotope can not be greater than the mass of the first isotope (after deduction the α-particle and two electrons), so all pairs of isotopes in which the mass gain is positive are excluded in the calculation.
b) According to the S_formula of the α_decay reaction, the number of burst mu-neutrinos can not be less than 1 pcs.

<u>Analysis of the results of calculating the reactions of α decay:</u>

The results of calculation of the reactions of α decay in ST are given on the same diagram (see Fig. 10_12). The isotopes subject to the reactions of α decay in ST are painted blue (coinciding with the list of Wiki-2016) and green (not coincident with the list of Wiki-2016).

We will not give lists of isotopes with coincident and non-coincident reactions of α decay in ST and Wiki-2016, we shall limit ourselves to specifying their number.

The list of (+, +) coinciding reactions for ST and for Wiki-2016 includes 594 isotopes.

The list of (+, -) for ST (+), and Wiki-2016 (-) includes 1483 isotopes.

The list (-, +) for ST (-), and Wiki-2016 (+) includes 23 isotopes.

The last two lists, as we mentioned earlier, speak about the probabilistic nature of the number of bursting mu-neutrinos in the reactions of α_decay and some deviation of the masses of the isotopes formed from their reference masses. The reference masses of isotopes are averaged in this case.

Let us verify this by comparing the amount of the remaining mu-neutrinos in the isotope after the α_decay reaction with the analogous amount of the remaining mu neutrinos in the isotope after the nr-nucleosynthesis reaction. The discrepancy of this quantity in 1483 isotopes lies in the range from -6 to +5 mu-neutrinos. In Fig. 10_14 shows the distribution of the initial isotopes of α_decay over the indicated range of discrepancies in the number of remaining mu-neutrinos.

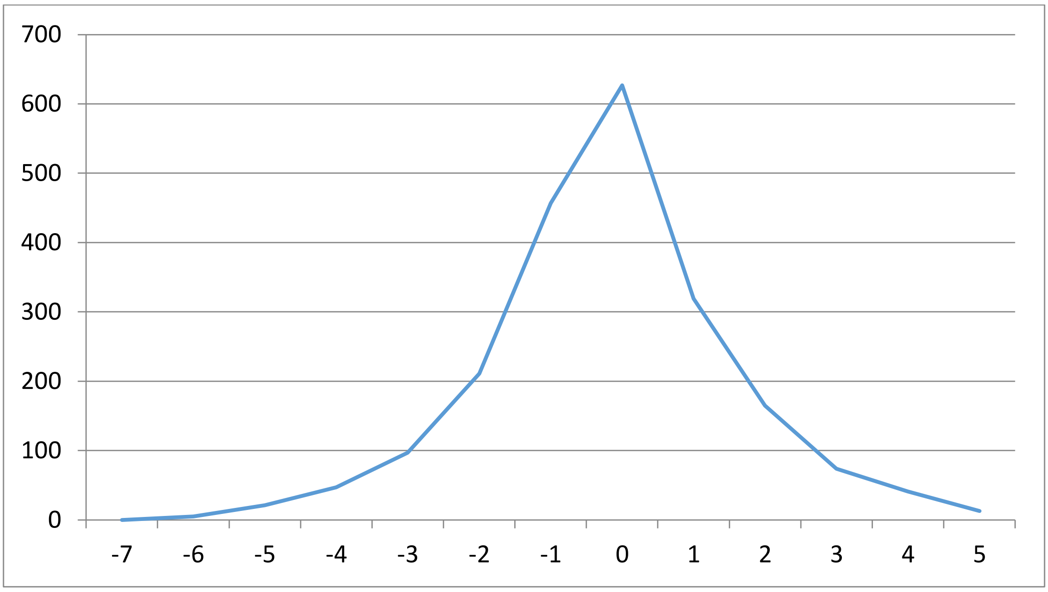


Fig. 10_14. The distribution of isotopes of α_decay over the range of discrepancies in the number of remaining mu-eutrinos with similar isotopes of nr-nucleosynthesis

Taking into account the probabilistic deviation of the isotope masses, the list of isotopes subject to the α_decay reactions, both from the ST list and from the Wiki-2016 list, can be expanded, with the (-, +) and (+, -) lists being reset.

A significant excess of the list of isotopes_ST, subject to the reactions of α_decay, over the experimental list_Wiki-2016 is explained by the "interception" of the α_decay reactions by nuclear β-decay reactions. The conditions for "interception" of some nuclear reactions by others require additional investigation. We tried to evaluate this phenomenon from the point of view of the priority of nuclear reactions with a minimum number of bursting mu-neutrinos and, accordingly, with a minimum energy result. The results of the calculation are shown in the diagram (see Fig. 10_15).

Fig. 10_15. Interception of the reactions of α_decay by the β-decay reactions (part 1)

p\n	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
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5		-	-	-	α	-	-	-	-	-	-	-	-	-	-																										
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31																										α	α	α	α	α	α	α	α	α	β+	α	α	α	α	α	α
32																											α	α	α	α	α	α	α	α	β+	α	α	β+	α	α	α
33																												α	α	α	α	α	α	α	α	α	α	α	β+	α	α
34																																α	α	α	α	α	β+	α	α	β+	α
35																																	α	α	α	α	α	α	α	α	α
36																																		α	α	α	α	α	β+	α	α
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38																																				α	α	α	α	α	α
39																																						α	α	α	α
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41																																									α

Fig. 10_15. Interception of the reactions of α_decay by the β-decay reactions (part 2)

p\n	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
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27	-	-	-	-	-	-	-	-																																
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29	-	-	-	-	-	-	-	-	-	-	-																													
30	α	-	-	-	-	-	-	-	-	-	-	-	-																											
31	α	α	-	-	-	-	-	-	-	-	-	-	-	-	-																									
32	α	α	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-																							
33	β-	α	α	α	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-																					
34	α	α	α	α	α	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-																				
35	α	α	β-	α	α	α	-	-	-	-	-	α	-	-	-	-	-	-	-	-	-	-																		
36	α	α	β+	α	α	α	α	-	-	-	-	α	-	-	-	-	-	-	-	-	-	-	-	-																
37	α	α	α	α	α	α	α	α	-	-	-	α	α	α	α	α	α	-	-	-	-	-	-	-	-															
38	α	β+	α	α	α	α	α	α	-	-	-	β-	α	α	α	α	α	α	-	-	-	-	-	-	-	-	-													
39	α	α	α	α	α	α	α	α	-	-	α	β-	α	α	α	α	α	α	α	-	-	-	-	-	-	-	-	-	-											
40	α	α	α	β+	α	β+	α	α	α	α	α	α	α	α	β-	α	α	α	α	α	-	-	-	-	-	-	-	-	-	-										
41	α	α	α	α	α	α	α	α	α	α	β+	α	β-	β-	β-	β-	α	α	α	α	α	-	-	-	-	-	-	-	-	-	-	-								
42	α	α	α	α	α	α	α	α	α	α	α	α	α	α	α	α	β-	α	β-	β-	α	α	α	-	-	-	-	-	-	-	-	-	-							
43		α	α	α	α	α	α	α	α	α	α	β+	β+	α	β+	α	β-	β-	α	α	α	α	α	α	α	α	α	-	-	-	-	-	-	-	-					
44			α	α	α	α	α	α	α	β+	β+	α	α	α	α	α	α	α	β-	α	α	α	α	α	α	α	α	α	-	-	-	-	-	-	-	-				
45				α	α	α	α	α	α	α	α	β+	β+	β+	β+	α	β-	α	β-	β-	α	β-	α	α	α	α	α	α	-	-	-	-	-	-	-	-	-			
46					α	α	α	α	α	α	α	β+	β+	α	β+	α	α	α	α	α	α	α	β-	α	α	α	α	α	α	-	-	-	-	-	-	-	-	-		
47						α	α	α	α	α	α	β+	α	β+	α	β+	β+	α	β+	α	β-	α	β-	β-	α	β-	α	α	α	α	α	-	-	-	-	-	-	-	-	-
48							α	α	α	α	α	β+	β+	β+	β+	α	β+	α	α	α	α	α	α	α	α	α	β-	α	α	β-	α	α	-	-	-	-	-	-	-	-
49								α	α	α	α	α	α	β+	α	β+	α	β+	β+	β+	β+	α	β-	α	β+	β-	α	β-	α	α	α	α	α	-	-	-	-	-	-	-
50									α	α	α	β+	α	β+	β+	β+	β+	β+	β+	α	β+	α	α	α	α	α	α	α	α	α	α	α	α	-	-	-	-	-	-	-
51												α	α	α	α	β+	α	β+	α	β+	α	β+	β+	β+	β+	β+	β+	α	β-	α	β+	α	α	β-	α	α	α	α	-	-
52													α	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	α	β+	α	α	α	α	α	α	α	β-	α	β-	α	β-	β-
53															α	β+	α	β+	α	β+	α	β+	β+	β+	β+	β+	β+	β+	β+	α	β+	α	β-	α	β-	α	β-	β-	α	β-
54																β+	α	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	α	β+	α	β+	α	α	α	α	α	α	α	β-	α
55																	α	β+	α	β+	α	β+	α	β+	α	β+	α	β+	β+	β+	β+	β+	β+	α	β+	α	β-	α	β-	α
56																		β+	α	β+	α	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	α	β+	α	α	α	α	α	α	α
57																				α	α	α	α	α	α	β+	α	β+	α	β+	β+	β+	β+	β+	β+	β+	β+	α	β-	α
58																					α	β+	α	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	α	β+	α	β+	α	α	α
59																						α	α	α	α	α	α	β+	α	β+	α	β+	β+	β+	β+	β+	β+	β+	β+	β+
60																								β+	α	β+	α	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	α	β+	α
61																									α	α	α	α	α	β+	α	β+	α	β+	β+	β+	β+	β+	β+	β+
62																										β+	α	β+	α	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+
63																											α	α	α	β+	α	β+	α	β+	α	β+	α	β+	β+	β+
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67																																	α	β+	α	β+	α	β+	α	β+
68																																			α	β+	β+	β+	β+	β+
69																																				α	α	α	α	α
70																																						β+	α	β+
71																																							α	α

Fig. 10_15. Interception of the reactions of α_decay by the β-decay reactions (part 3)

p\n	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
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54	β-	α	β-	β-	β-	β-	α	α	α	α	α	α	-																										
55	β-	β-	β-	β-	β-	β-	α	α	α	α	α	α	α	-	-	-																							
56	α	α	β-	β-	β-	β-	β-	β-	α	β-	α	α	α	α	α	-	-																						
57	β-	α	β-	β-	β-	β-	β-	β-	α	α	α	α	α	α	α	α	α	α																					
58	α	α	β-	α	β-	α	β-	β-	β-	β-	β-	β-	α	α	α	α	α	α	α																				
59	β+	α	β-	β-	β-	β-	β-	β-	β-	β-	α	β-	α	α	α	α	α	α	α	α																			
60	β+	α	α	α	α	α	β-	α	β-	α	β-	β-	β-	β-	α	α	α	α	α	α	α																		
61	β+	α	β-	α	β+	α	β-	β-	β-	β-	β-	β-	β-	β-	α	α	α	α	α	α	α	α																	
62	β+	α	α	α	α	α	α	α	α	α	β-	α	β-	β-	β-	β-	β-	β-	α	β-	α	α	α																
63	β+	β+	β+	β+	β+	α	β-	α	β-	α	β-	α	β-	β-	β-	β-	β-	β-	α	α	α	α	α	α															
64	β+	α	β+	α	α	α	α	α	α	α	α	α	α	α	β-	α	β-	β-	β-	β-	β-	β-	α	α	α														
65	α	β+	β+	β+	β+	β+	β+	β+	β+	α	β-	α	β-	α	β-	β-	β-	β-	β-	β-	β-	β-	α	α	α	α													
66	β+	β+	β+	β+	β+	α	β+	α	β+	α	α	α	α	α	α	α	α	α	β-	β-	β-	β-	β-	β-	β-	β-	α												
67	α	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	α	β+	α	β-	α	β-	β-	β-	β-	β-	β-	β-	β-	α	α											
68	β+	β+	β+	β+	β+	β+	β+	α	β+	α	β+	α	β+	α	α	α	α	α	α	α	α	α	β-	β-	β-	β-	β-	β-	β-										
69	α	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	α	β+	α	β-	α	β-	β-	β-	β-	β-	β-	β-	β-									
70	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	α	β+	α	β+	α	α	α	α	α	α	α	β-	α	β-	β-	β-	β-	β-								
71	α	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	α	α	α	β-	β-	β-	β-	β-	β-	β-	β-	-						
72	α	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	α	β+	α	β+	α	α	α	α	α	α	α	β-	α	β-	β-	β-	-	-	-			
73		β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	α	β+	α	β-	α	β-	β-	β-	β-	β-	β-	β-	-	-			
74				β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	α	β+	α	α	α	α	α	α	α	β-	α	β-	α	β-	β-	β-	β-		
75					β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	α	β+	α	β-	α	β-	β-	β-	β-	β-	β-	β-	
76						β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	α	β+	α	α	α	α	α	α	α	α	α	β-	α	β-	β-
77							β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	α	β-	α	β-	α	β-	β-	β-	β-
78								β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	α	β+	α	β+	α	α	α	α	α	α	α	β-	α
79										β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	α	β+	α	β-	α	β-	β-
80											β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	α	β+	α	β+	α	α	α	α	α
81															β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	α
82																β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	α	β+	α	β+	α
83																					β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+
84																								β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+
85																												β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+
86																													β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+
87																																β+	β+	β+	β+	β+	β+	β+	β+	β+
88																																		β+	β+	β+	β+	β+	β+	β+
89																																					β+	β+	β+	β+
90																																							β+	β+

Fig. 10_15. Interception of the reactions of α_decay by the β-decay reactions (part 4)

p\n	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160
77	β-	-																																					
78	β-	β-	-	-																																			
79	β-	β-	β-	β-	-	-																																	
80	α	α	β-	α	β-	β-	-	-	-	-																													
81	α	α	β-	α	β-	β-	β-	β-	-	-	-																												
82	α	α	α	α	α	α	β-	α	β-	β-	β-	β-	-																										
83	β+	β+	β+	β+	β+	α	β-	β-	β-	β-	β-	β-	β-	-	-																								
84	β+	β+	β+	α	β+	α	α	α	α	α	β-	α	β-	α	β-	-																							
85	β+	β+	β+	β+	β+	α	β+	α	β-	α	β-	β-	β-	β-	β-	β-	β-	-																					
86	β+	β+	β+	β+	β+	α	α	α	α	α	α	α	α	α	β-	α	β-	β-	-	-	-	-	-																
87	β+	β+	β+	β+	β+	β+	β+	β+	β+	α	β+	α	β-	α	β-	β-	β-	β-	β-	β-	-	-	-	-	-														
88	β+	β+	β+	β+	β+	α	β+	α	β+	α	α	α	α	α	α	α	α	α	β-	α	β-	β-	β-	β-	β-	-													
89	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	α	α	α	β-	α	β-	β-	β-	β-	β-	β-	β-	β-	β-												
90	β+	β+	β+	β+	β+	β+	β+	β+	β+	α	β+	α	β+	α	α	α	α	α	α	α	α	α	β-	α	β-	β-	β-	β-											
91	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	α	β+	α	β-	α	β-	β-	β-	β-	β-	β-	β-	β-	β-										
92					β+	β+	β+	β+	β+	β+	β+	β+	β+	α	β+	α	α	α	α	α	α	α	α	α	β-	α	β-	α	β-	β-									
93												β+	β+	β+	β+	β+	β+	β+	β+	α	β+	α	β-	α	β-	β-	β-	β-	β-	β-	β-								
94														β+	β+	β+	β+	α	β+	α	α	α	α	α	α	α	α	α	β-	α	β-	α	-						
95																β+	β+	β+	β+	β+	β+	β+	β+	α	α	α	β-	α	β-	β-	β-	β-	β-	-					
96																	β+	β+	β+	β+	β+	α	β+	α	α	α	α	α	α	α	α	α	β-	α	β-	-			
97																		β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	α	α	α	β-	α	β-	β-	β-	β-	-		
98																			β+	β+	β+	β+	β+	β+	β+	α	β+	α	α	α	α	α	α	α	α	α	β-	α	
99																					β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	β+	α	β-	α	β-	α	β-	β-	β-	
100																						β+	β+	β+	β+	β+	β+	β+	β+	α	β+	α	α	α	α	α	α	α	α	α

The coloring of the diagram is as follows. All the colored cells are isotopes subject to the reactions of α_decay in ST.
In blue isotopes, the reactions of α_decay are "intercepted" by β-_decay reactions, which in these isotopes are less energy-intensive than the reactions of α_decay.
In green isotopes, the α_decay reactions are "intercepted" by the β+_decay reactions, which in these isotopes are less energy-intensive than the α_decay reactions.
Isotopes, in which the α_decay reactions have lower energy costs, are colored yellow.
The final coloring of the cloud is very different from the experimental data of isotopes subject to the α_decay reactions. Therefore, this diagram can be considered only as a visual representation of the ratio of the energy result of the reactions.
Why did this result not coincide with the experimental data?
The fact is that the type of reaction occurring in the isotope is determined not by its energy result, but by the place in which the mu-neutrino bursts with respect to the "quark hoop". But this is influenced by many other factors.
In the same isotope, various decay reactions can occur, but which one is determined by the site of the mu-neutrino bursting. This results in a corresponding energy result.
According to calculations, in the reactions of α_decay, the from 1 to 92 mu-neutrinos bursting. The energy result of the α_decay reactions, calculated from the formula derived by us, is in the range from 0.011208 MeV (in 90Zr) to 16.977255 MeV (in 220U), which corresponds completely to the energy of the decay reactions, calculated according to the formula E = (m_1-m_2) * c2 for masses of isotopes expressed in SI units, or E = m_1-m_2 for masses of isotopes expressed in MeV.

S_analysis of the reactions of n_decay and p_decay of isotopes

We will not give a detailed S_analysis of these reactions, they are fundamentally little different from the reactions of α_decay. There is, however, one additional complexity - we do not know the specific number of mu-neutrinos (and hence the mass) of the departing neutron or proton. Of course, we can determine these values by the method of their approximation. If desired, readers can conduct this analysis on their own.
We note only some features of these reactions.
The reactions of p_decay and n_decay of isotopes differ from the α_decay reactions the fact thatin the course of these reactions are break off they are separated not by α-particles but individual neutrons (n) and protons (p) from isotope. In the "normal" isotopes formed as a result of the reactions of nr_nucleosynthesis, nucleons can be detached only at the end of the nucleus, since at the beginning of the nucleus they have a very strong α_particle.
The proposed scheme (S_model) of reactions of n_decay and p_decay does not allow the same isotope to be simultaneously exposed to the reactions of n_ decay and p_ decay. Verification of this statement on the background of experimental data gives a positive result, which indirectly confirms the correctness of our S- model of nucleus.
Analyzing the reactions of α_decay, we established the asymmetric nature of the propagation directions of the perturbation wave from the bursting mu-neutrinos toward the nucleus beginning and toward the end of the nucleus. In the first direction, the number of flagellums gluons_SIF on average constantly increases, and hence the "resistance" for the propagation of the wave is constantly decreasing. In the second direction, the opposite is true.
Therefore, in order for the perturbation wave from bursting mu-neutrinos to reach the end of the nucleus faster than before it began (and led to the detachment of a neutron or a proton), it is necessary that the mu-neutrinos burst much closer to the end of the nucleus.
Another feature of the reactions of n_decay and p_decay is the fact that, according to the regularities that we have revealed, all neutrons and protons in the nucleus have an explicit pairing, leading to an increased number of gluon bonds between the odd and succeeding even neutron (or proton), and to a lower the number of gluon links between the even and subsequent odd neutron (or proton).
This suggests that breakaway neutrons or protons should have mostly odd numbers. However, an analysis of the experimental data and the results of our calculations does not support this assumption. Why?

Perhaps this is due to the relatively wide spread of the reactions of double, triple and even quadruple n_decay (2n, 3n, 4n), and double and triple p_decay (2p, 3p), which somewhat distort the theoretical picture.
Isotopes subject to the multiple n_decay and p_decay reactions are also of interest for a separate analysis, from the point of view of verifying the correlation of the results of these decays with isotope groups formed as a result of the nr_nucleosynthesis reaction sequences by the HA and VA algorithms.
At a fast S_analysis of the experimental data, we did not reveal "irreconcilable" contradictions on this issue, although some "refinements" to these data S_theory "would" like to make. So isotope 16B, according to experimental data subject only to the reaction of a single n_decay, but according to S_theory should have another double and triple n_decay (2n, 3n). This material requires a separate additional study.
Let us pass to the S_analysis of nuclear decay reactions.

S_analysis of the decay reactions of isotope nuclei

Nuclear decay reactions (NDR) have two different physical natures (S-models):
<u>The first</u> is exactly the same as the reactions of α_decay, n_decay, and p_decay, when spontaneous bursting of the mu-neutrino causes a traveling perturbation wave in the flagellums of gluons, which results in a "whip strike" at the cantilever end of the flagellums and the detachment of some nucleons (this kind of decay can be call <u>spontaneous</u>).
<u>The second</u> is the decay of the nucleus <u>under external influence</u>, as a rule, from an external neutron impact. A neutron strucking on the nucleus can be emitted by the nuclei of neighboring isotopes, and with respect to the whole material sample is also internal. Therefore, this type of decay is also sometimes called spontaneous, which in our view introduces some confusion. It is unlikely that this terminology can be changed (so many articles have already been written using this terminology), we do not set such a task, but in our work the term spontaneous fission is only related to the first variant of nuclear fission.
And one more remark on the second variant. In the Standard Model, a model is adopted according to which an external neutron is absorbed ("merged") with a nucleus (say, uranium), resulting in its excitation with the subsequent division into two nuclei of two isotopes.
In S_theory, the process of neutron impact on the uranium nucleus is considered as a blow, resulting in a "splitting" (rupture) of the "bend" or "sausage" of the uranium nucleus into two parts. No absorption of the neutron occurs, it can only collapse or be among the products of the decay reaction.
The decay reactions of isotope nuclei are multivariate. This means that the core of one and the same isotope can decay both spontaneously and under external influence. In addition, as a result of the reaction, different pairs of isotopes can form (the nucleus can break in any "place"). Considering all this, we did not begin to build the whole variety S_formulas of the particle transformation during the reactions of the NDR, but we restrict ourselves only to the following brief description:
a) bursts of N mu-neutrinos,
b) the nucleus of Iran is splitting into two parts (two isotopes),
c) the bursting simples of Sμ are shortened, as a result, in both fragments (isotopes), the mass (energy) of the flagellums of gluons_SIF are increases
d) the remaining mass (energy) of the bursting mu-neutrinos annihilates and turns into pairs of electron-antineutrinos and gamma quanta, as well as gluons_F, which represent the energy result of the NDR reactions.
With this in mind, it is somewhat difficult to make a complete calculation of the entire isotope cloud for all possible variants of nuclear decay reactions.
Therefore, S_analysis of these reactions will be conducted using the example of the most well-known isotope, subject to nuclear decay reactions (NDR), the $^{235}U_{92}$ isotope.
Let's begin S_analysis of NDR with analysis of spontaneous fission reactions without external influence. The main "channel" for spontaneous fission of the isotope $^{235}U_{92}$ is the α_ decay reaction:

$$^{235}U_{92} \rightarrow {}^{231}Th_{90} + {}^{4}He_{2}$$

We shall conduct an analysis of the reactions of the NDR at the level of the nuclei, without taking into account the isotope electrons. We distinguish this circumstance in the formulas by the lower underscore of the notation of isotopes.

Above we have already described in detail the S_model of the reactions of the α_decay of isotopes, and carried out their calculation. According to the calculation, 11.4 MeV of energy is released during the reaction of the α_decay of the 235U92 isotope. The further "fate" of isotopes-decay products, we do not consider here.
In addition to this "α_channel", the isotope 235U92 has three more "channels" of spontaneous decay, these are:

$$^{235}\underline{U}_{92} \rightarrow {}^{215}\underline{Pb}_{82} + {}^{20}\underline{Ne}_{10}$$
$$^{235}\underline{U}_{92} \rightarrow {}^{210}\underline{Pb}_{82} + {}^{25}\underline{Ne}_{10}$$
$$^{235}\underline{U}_{92} \rightarrow {}^{207}\underline{Hg}_{80} + {}^{28}\underline{Mg}_{12}$$

In Chapter 5 (the shape of the nucleus) we have already noted that all the nuclei of the isotopes ("sausages") in their initial part have a clearly expressed division into "beads" consisting of 4 nucleons. Let us illustrate this again in the form of a diagram of the number of bursting mu-neutrinos in the formation of isotopes according to the "Fan algorithm" in the main-stream isotope chain, see Fig. 10_16.

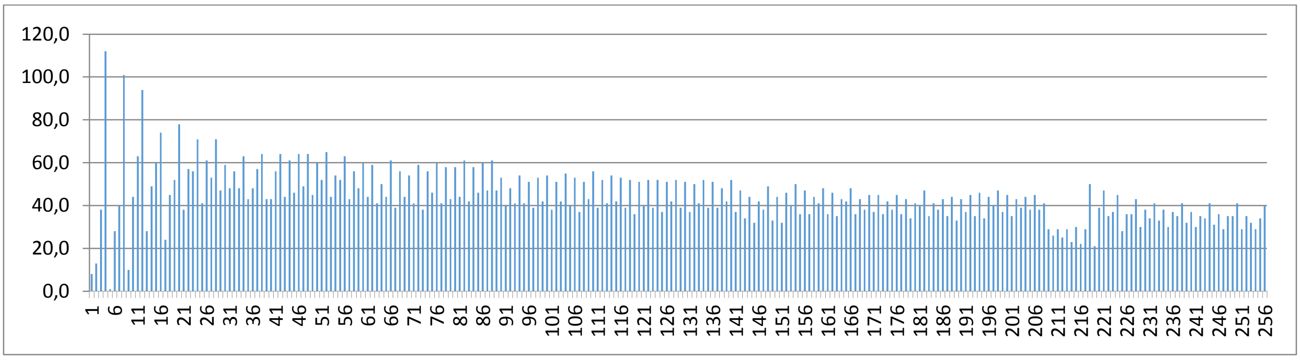


Fig. 10_16. The diagram of bursting mu-neutrinos with the formation of main-stream isotopes

Let us single out the initial part of the diagram from 52 isotopes on a larger scale (see Fig. 10_17).

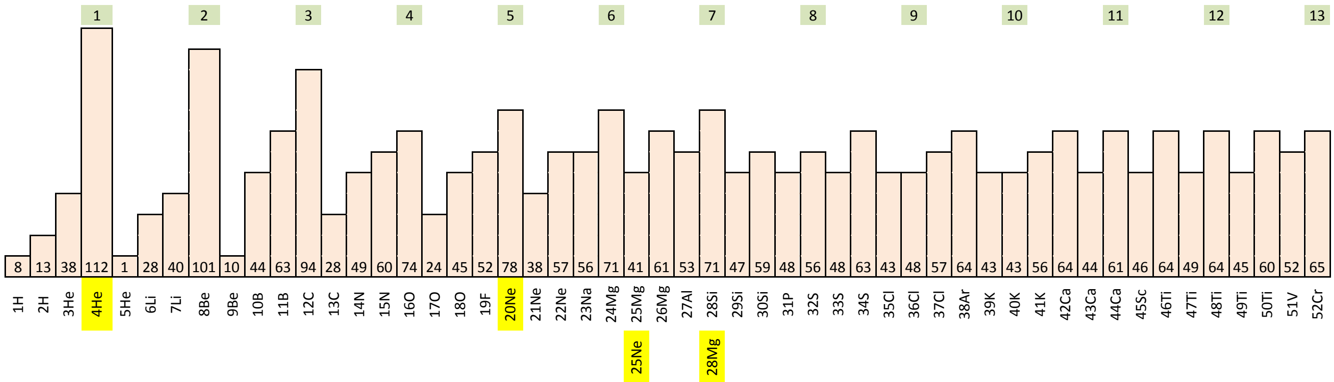


Fig. 10_17 The initial part of the diagram of bursting mu-neutrinos

We deliberately distorted the vertical scale of the diagram a little, rounding up all the numbers to dozens to better illustrate the dynamics of the number of bursting mu-neutrinos and a clear grouping of these data into four isotopes. The diagram clearly shows eight such fours ("beads") at the beginning of the diagram. The further dynamics of the number of bursting mu-neutrinos, as can be seen from the upper diagram, turns into a wavy process of alternating maxima and minima with some deviations.
The first four has a chain of nucleons p-n-p-n (double "clamps "), the second, third and fourth quadruples consist of a chain of n-p-n-p nucleons (also double "clamps "), fifth = n-n-p-n, sixth, seventh and eighth = n-n-p-p.
Between the fours, with the connection of every fifth nucleon, much less mu-neutrinos burst. This is the basis of our assertion that the quadruple is the maximum number of nucleons in which the slotted magnets ("hoops" of quarks) can be as close to each other as possible, forming a kind of eight leaf (Fig. 5_10) in the section. According to our S-models of nucleons, the eight-leaves are formed by combining four nucleons, which form a double "mites" structure. The first four fours correspond to this condition.

The structure of the nucleons of the Fifth Quartet is not double "clamps". The first two neutrons of this four also form a strong coaxial connection, which is tightened by three pairs of slotted magnets. The third nucleon (proton) has a weak non-coaxial connection with the first pair of neutrons, but the fourth nucleon (neutron) forms "clamps" firmly compressing the proton between itself and the first two neutrons. In this case, a sufficient amount of mu-neutrinos bursts, so that their slit magnets also attract each other as much as possible, forming a strong bead.

The sixth, seventh and eighth foursome form a kind of triple clamps of six pairs of the same type of nucleons. Each pair is coaxially connected to each other, and between the same types of pairs, the "bridges" of the reinforcing flagellums of gluons are additionally spanned.

The reduced diagram of the number of bursting mu-neutrinos from nucleons is, of course, conditional. In one nucleon (relic neutron) there were initially 61 mu-neutrinos. But, at least 9 mu-neutrinos should remain intact, so that the nucleon continues to exist. So it could burst a maximum of 52 mu-neutrinos, and the diagram has columns much larger than a given magnitude.

When we are talking about the decay of the $^{235}U_{92}$ isotope located behind the $^{56}Fe_{26}$ isotope, we know that by this time, 52 mu-neutrinos have burst in all 56 first nucleons, and only 9 mu-neutrinos have remained intact, that is the diagram becomes absolutely equal. But this does not mean that all slot magnets ("hoops" of quarks) are absolutely evenly distributed along the length of this section of the nucleus. Slit magnets ("hoops" of quarks) as were grouped in groups of four pieces, and remained, i.e. the grouping of nucleons in the fours at the beginning of the nucleus is preserved. And this means that in the intervals between the fours the distance between the "hoops" of the quarks is increased and the electromagnetic bonds between them are weakened. These places are weak "links" of the electromagnetic "chain" pulling all the nucleons into a single core, and with a certain impact on them they can tear.

Such an effect can be an result of a traveling wave of perturbation from the spontaneous bursting of a mu-neutrino. In what place is the gap and how many "beads" will come off depends on the strength (energy) of the wave. According theory of "whip", the stronger the force of "blow", the longer the end of the "whip" can come off.

It turns out that α_decay (as well as n_decay and p_decay) occur at some minimal impact. But with a greater impact, a "piece" of the core, consisting of several "beads", can come off.

Let us check the S_model of the NDR reactions described by us on the example of spontaneous decay of $^{235}U_{92}$ isotopes.

The yellow color in the diagram indicates light isotopes that break away from the isotope 235U92 during spontaneous fission.

As we can see, three of their four detachment isotopes ($^{4}He_{2}$, $^{20}Ne_{10}$, $^{28}Mg_{12}$) represent an integer number of "beads" - quads, which basically corresponds to our S-model.

But the fourth light isotope $^{25}Ne_{10}$ per one nucleon exceeds the integer number of quads. But we have already noted that the seventh four, from which a single neutron are detached, are not double "mites" (a very strong four), but enters into a kind of "conglomerate" of 12 nucleons united in a kind of triple "clamp" from pairwise grouped nucleons. One such pair of neutrons (extreme) is broken.

The places of the discontinuity of the nucleus, as we have already noted, must depend on the energy of the traveling wave. Knowing the mass (the number of mu-neutrinos) in the initial isotope and the mass (the number of mu-neutrinos) in the separated isotope, we can calculate the energy of the discontinuity (the number of mu-neutrinos that burst). We will carry out this calculation and analyze its results.

The calculation is carried out according to the following algorithm. We shall not limit ourselves to the above-mentioned pairs of NDR fragments of uranus. We shall calculate all possible pairs of isotopes-fragments, into which the isotope 235U can decay.

For each pair of fragments isotopes (m_1 and m_2), we calculate the mass defect by the formula:

$\Delta m_{12} = (m_1 + m_2) - m_{235U}$

We believe that directly in the course of the NDR, there are no changes in the "hoops of quarks" and the total number of electrons. Then, the number of burst mu-neutrinos for each pair will be equal to:

$\Delta N_{12} = \text{INTEGER} (\Delta m / v_{\mu})$

The increase in the mass (energy) of gluons_SIF in both resultant isotopes (without taking into account the change in ionization energy) will be equal to:

$\Delta g_{SIF} = (m_1 + m_2) - (m_{235U} - \Delta N_{12} * v_\mu)$

The energy result of the decay reactions of the isotope 235U will be:

$E_{NDR(235U)} = \Delta N_{12} * v_\mu - \Delta g_{SIF}$

In Fig. 10_18 is a graph showing the results of calculations. To enlarge the scale on the horizontal axis, only the isotopes contained in the pairs of FNR 235U isotopes are lefted. The isotopes that "did not find" their pair, because of a positive mass defect, were missed. The interval of the inscriptions under the horizontal axis is 15 isotopes.

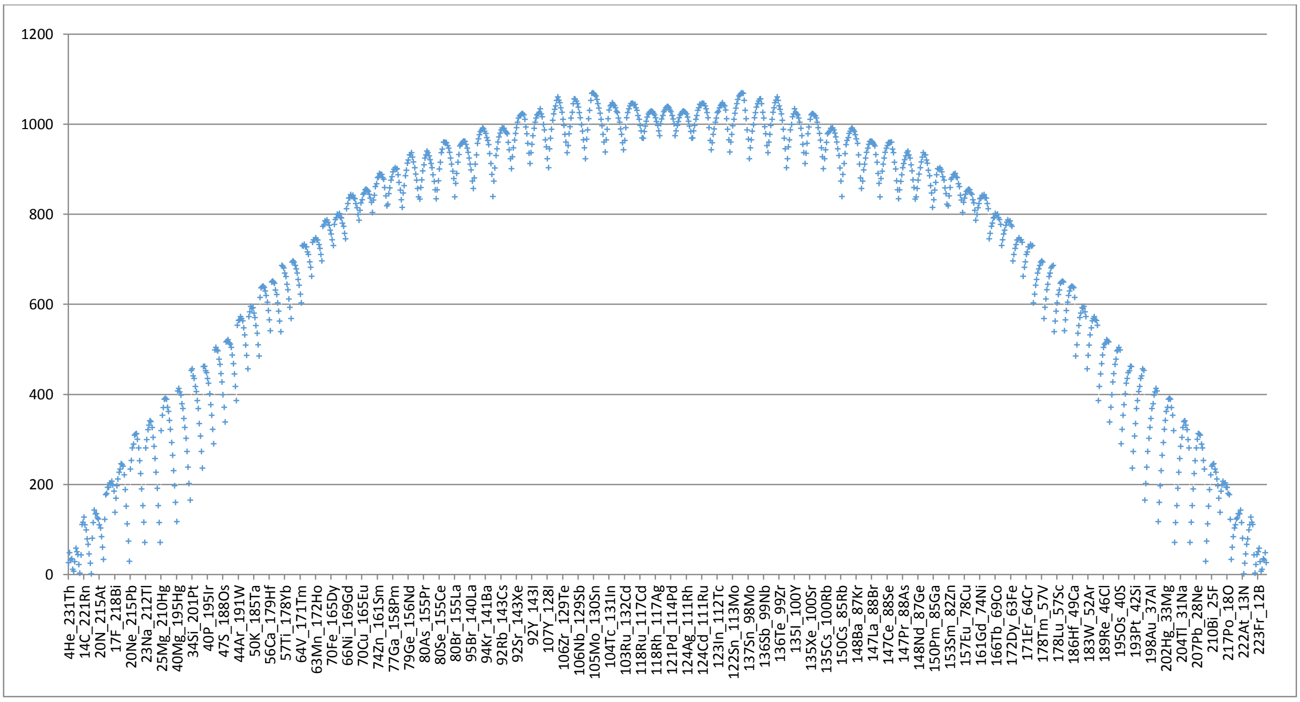


Fig. 10_18. The theoretical number of burst mu-neutrinos in the case of NDR 235U

As a result, we obtained a graph very reminiscent of the well-known graph of the "Curve of the yield of fission products of uranium-235 for different neutron-energy" for NDR under the action of external influences (see Fig. 10_19).

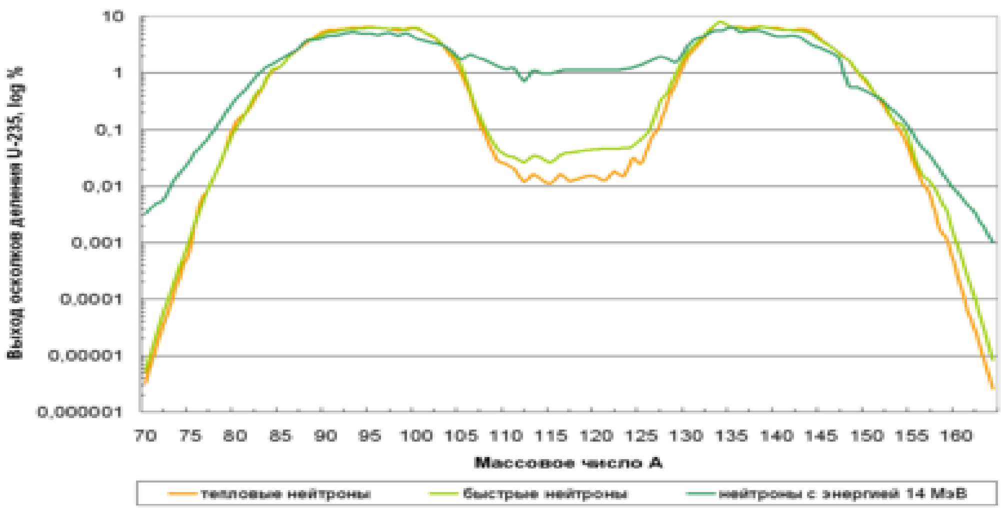


Fig. 10_19. The energy result of fission products of uranium-235 for various of neutron fission energies

It turns out that our calculation covered both types of NDR reactions, both spontaneous fission, and fission under external influence.

What does our graph say of the first kind of NDR (spontaneous fission)?

In total, the graph shows the data for 1164 pairs of isotopes, for which 235U isotope can theoretically decay. For a more detailed examination of the results, we present the initial part of Table 23 with the calculated data for the isotope range from 4He to 40Mg corresponding to the "trumpet of whip".

Table 23. Isotopes of "trumpet of whip "

Isotope 1 (fragment 1)	Isotope 2 (Shard 2)	The resulting pair of isotopes	Bursted mu in two isotopes
4He	231Th	4He_231Th	26
8Be	227Ra	8Be_227Ra	48
9Be	226Ra	9Be_226Ra	32
10Be	225Ra	10Be_225Ra	35
11Be	224Ra	11Be_224Ra	11
9B	226Fr	9B_226Fr	7
10B	225Fr	10B_225Fr	28
11B	224Fr	11B_224Fr	58
12B	223Fr	12B_223Fr	50
13B	222Fr	13B_222Fr	44
14B	221Fr	14B_221Fr	22
15B	220Fr	15B_220Fr	3
11C	224Rn	11C_224Rn	43
12C	223Rn	12C_223Rn	111
13C	222Rn	13C_222Rn	116
14C	221Rn	14C_221Rn	127
15C	220Rn	15C_220Rn	110
16C	219Rn	16C_219Rn	99
17C	218Rn	17C_218Rn	79
18C	217Rn	18C_217Rn	67
19C	216Rn	19C_216Rn	45
20C	215Rn	20C_215Rn	25
12N	223At	12N_223At	1
13N	222At	13N_222At	80
14N	221At	14N_221At	115
15N	220At	15N_220At	143
16N	219At	16N_219At	134
17N	218At	17N_218At	135
18N	217At	18N_217At	126
19N	216At	19N_216At	123
20N	215At	20N_215At	110
21N	214At	21N_214At	103
22N	213At	22N_213At	84
23N	212At	23N_212At	60
24N	211At	24N_211At	33
15O	220Po	15O_220Po	122
16O	219Po	16O_219Po	177
17O	218Po	17O_218Po	180
18O	217Po	18O_217Po	193
19O	216Po	19O_216Po	193
20O	215Po	20O_215Po	203
21O	214Po	21O_214Po	201
22O	213Po	22O_213Po	207
23O	212Po	23O_212Po	198
24O	211Po	24O_211Po	185
17F	218Bi	17F_218Bi	138
18F	217Bi	18F_217Bi	169
19F	216Bi	19F_216Bi	197
20F	215Bi	20F_215Bi	212
21F	214Bi	21F_214Bi	227
22F	213Bi	22F_213Bi	234
23F	212Bi	23F_212Bi	246
24F	211Bi	24F_211Bi	244
25F	210Bi	25F_210Bi	240
26F	209Bi	26F_209Bi	221
27F	208Bi	27F_208Bi	188
28F	207Bi	28F_207Bi	151
29F	206Bi	29F_206Bi	112
30F	205Bi	30F_205Bi	74
31F	204Bi	31F_204Bi	29
20Ne	215Pb	20Ne_215Pb	234
21Ne	214Pb	21Ne_214Pb	253
22Ne	213Pb	22Ne_213Pb	281
23Ne	212Pb	23Ne_212Pb	289
24Ne	211Pb	24Ne_211Pb	309
25Ne	210Pb	25Ne_210Pb	311

Isotope 1 (fragment 1)	Isotope 2 (Shard 2)	The resulting pair of isotopes	Bursted mu in two isotopes
26Ne	209Pb	26Ne_209Pb	313
27Ne	208Pb	27Ne_208Pb	300
28Ne	207Pb	28Ne_207Pb	281
29Ne	206Pb	29Ne_206Pb	252
30Ne	205Pb	30Ne_205Pb	224
31Ne	204Pb	31Ne_204Pb	190
32Ne	203Pb	32Ne_203Pb	153
33Ne	202Pb	33Ne_202Pb	116
34Ne	201Pb	34Ne_201Pb	71
23Na	212Tl	23Na_212Tl	281
24Na	211Tl	24Na_211Tl	299
25Na	210Tl	25Na_210Tl	321
26Na	209Tl	26Na_209Tl	331
27Na	208Tl	27Na_208Tl	341
28Na	207Tl	28Na_207Tl	339
29Na	206Tl	29Na_206Tl	326
30Na	205Tl	30Na_205Tl	304
31Na	204Tl	31Na_204Tl	284
32Na	203Tl	32Na_203Tl	257
33Na	202Tl	33Na_202Tl	227
34Na	201Tl	34Na_201Tl	191
35Na	200Tl	35Na_200Tl	153
36Na	199Tl	36Na_199Tl	115
37Na	198Tl	37Na_198Tl	71
25Mg	210Hg	25Mg_210Hg	319
26Mg	209Hg	26Mg_209Hg	353
27Mg	208Hg	27Mg_208Hg	370
28Mg	207Hg	28Mg_207Hg	389
29Mg	206Hg	29Mg_206Hg	391
30Mg	205Hg	30Mg_205Hg	389
31Mg	204Hg	31Mg_204Hg	371
32Mg	203Hg	32Mg_203Hg	362
33Mg	202Hg	33Mg_202Hg	342
34Mg	201Hg	34Mg_201Hg	322
35Mg	200Hg	35Mg_200Hg	293
36Mg	199Hg	36Mg_199Hg	264
37Mg	198Hg	37Mg_198Hg	230
38Mg	197Hg	38Mg_197Hg	197
39Mg	196Hg	39Mg_196Hg	160
40Mg	195Hg	40Mg_195Hg	117

As we see, our assumption about local maxima or minima of the number of bursting mu-neutrinos in the isotopes 20Ne, 25Ne, 28Mg is not confirmed. It turns out that the energy result of the NDR reactions does not correlate with the binding energy of individual nucleons (or groups of nucleons) with each other. This once again confirms that research in the binding energy of individual nucleons (or groups of nucleons) among themselves in the nuclei of isotopes must be conducted in the direction of constructing the SGW (flagella gluons). Incidentally, this conclusion, if you recall, is also confirmed by the absence of a correlation between the number of bursting mu-neutrinos and the resulting gluons-SIF in the reactions of nr_nucleosynthesis (see Figures 4_14 and 4_15).
In Fig. 10_20 is a graph of the distribution of the number of isotopes from the deviation of the number of mu-neutrinos in the isotopes formed as a result of nr_nucleosynthesis and the isotopes products of decay of the isotope 235U, and Fig. 10_21 is a three-dimensional graph of the decay products of the isotope 235U.

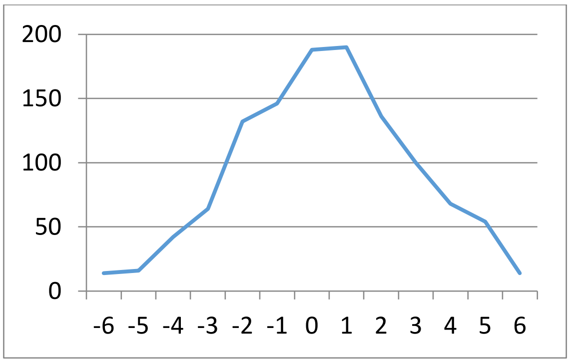


Fig. 10_20. "Bell" of deviations for 235U decay products from nr_nucleosynthesis

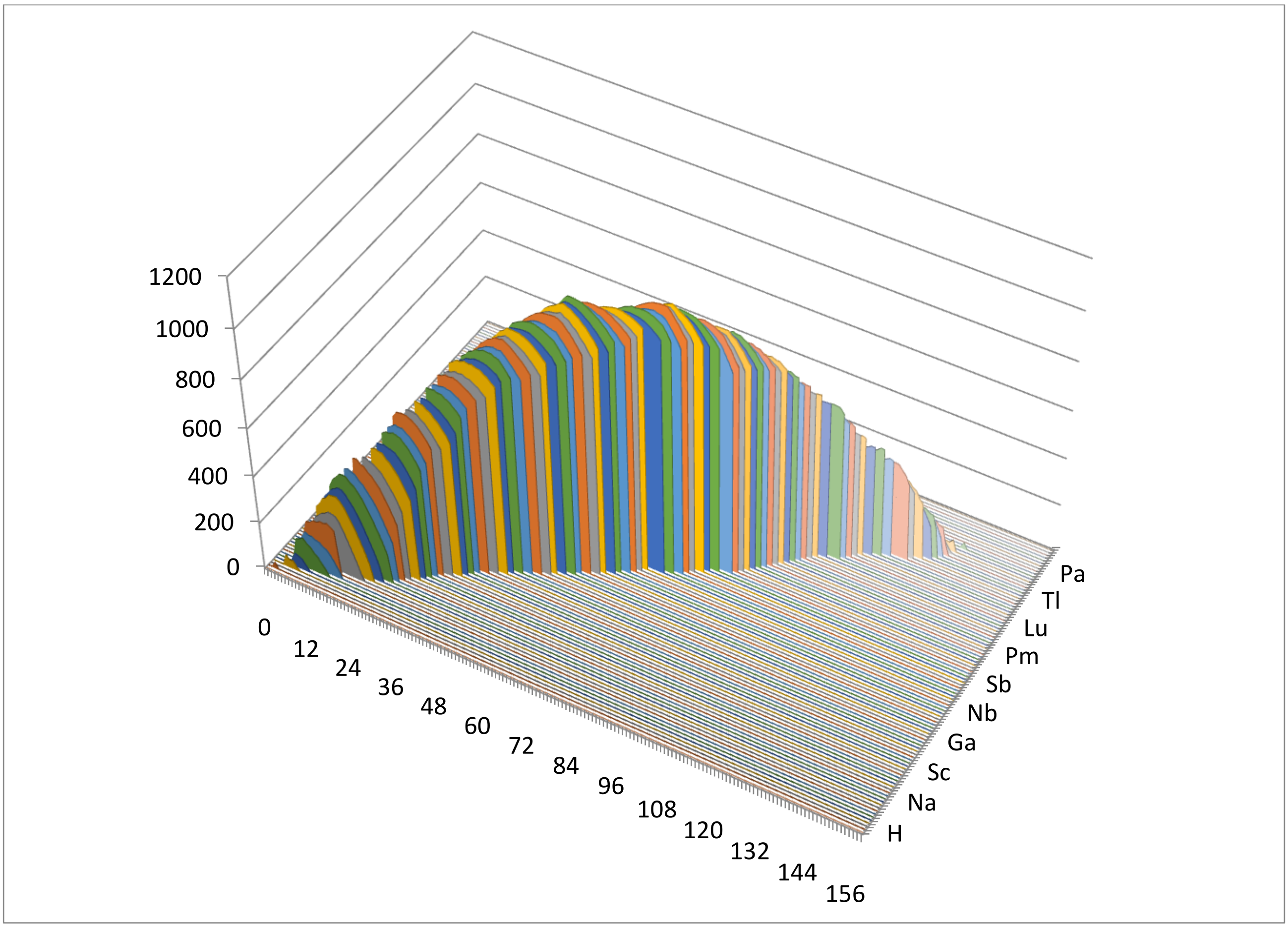


Fig. 10_21. Three-dimensional graph of decay products of the isotope 235U

It should be noted that most of the isotopes, 235 U decay products, are located in the isotope cloud in the region above the main-stream, i.e. subject to the β-_decay reactions, see the diagram in Fig. 10_22.

Fig. 10_22. The diagram of isotopes-235U decay products (part 1)

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
H	-	-	-	-	-	-	-																																		
He		-	26	-	-	-	-	-	-																																
Li		-	-	-	-	-	-	-	-	-																															
Be		-	-	-	48	32	35	11	-	-	-	-	-																												
B		-	-	-	7	28	58	50	44	22	3	-	-	-	-																										
C			-	-	-	43	111	116	127	110	99	79	67	45	25	-	-																								
N				-	-	1	80	115	143	134	135	126	123	110	103	84	60	33	-																						
O					-	-	-	122	177	180	193	193	203	201	207	198	185																								
F						-	-	-	138	169	197	212	227	234	246	244	240	221	188	151	112	74	29																		
Ne							-	-	-	-	234	253	281	289	309	311	313	300	281	252	224	190	153	116	71																
Na								-	-	-	-	-	281	299	321	331	341	339	326	304	284	257	227	191	153	115	71														
Mg								-	-	-	-	-	-	319	353	370	389	391	389	371	362	342	322	293	264	230	197	160	117												
Al									-	-	-	-	-	-	-	-	-	407	413	405	398	379	368	346	326	302	273	238	202	165											
Si									-	-	-	-	-	-	-	-	-	-	-	453	456	441	435	417	406	386	368	335	307	273	236										
P										-	-	-	-	-	-	-	-	-	-	-	-	461	462	452	448	435	424	401	377	353	322	290									
S											-	-	-	-	-	-	-	-	-	-	-	-	-	498	504	498	496	478	466	446	427	399	371	338							
Cl												-	-	-	-	-	-	-	-	-	-	-	-	-	516	518	521	514	511	504	487	468	445	417	386						
Ar													-	-	-	-	-	-	-	-	-	-	-	-	-	553	564	565	572	568	563	547	532	509	486	456					
K														-	-	-	-	-	-	-	-	-	-	-	-	-	572	583	595	591	592	580	570	552	535	510	485				
Ca															-	-	-	-	-	-	-	-	-	-	-	-	-	615	636	639	640	637	629	619	604	586	565	541			
Sc																-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	649	651	649	646	631	621	603	584	562	539	
Ti																	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	686	684	680	669	661	644	632	611	593
V																		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	693	696	693	686	678	669	655	642
Cr																			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	730	729	733	727	727	716	710
Mn																				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	737	743	743	747	743	742
Fe																				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	773	776	785	783	787
Co																					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	777	788	792	800
Ni																					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	812	823	835
Cu																		0						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	808	825
Zn																									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	831
Ga																										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ge																											-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
As																												-	-	-	-	-	-	-	-	-	-	-	-	-	-
Se																																-	-	-	-	-	-	-	-	-	-
Br																																	-	-	-	-	-	-	-	-	-
Kr																																		-	-	-	-	-	-	-	-
Rb																																			-	-	-	-	-	-	-
Sr																																				-	-	-	-	-	-
Y																																						-	-	-	-
Zr																																							-	-	-
Nb																																									-

Fig. 10_22. The diagram of isotopes-235U decay products (part 2)

	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
Ti	568																																							
V	622	603																																						
Cr	694	682	662																																					
Mn	732	724	710	696																																				
Fe	782	775	764	756	743	730																																		
Co	798	801	793	791	780	773	757	745																																
Ni	836	843	839	842	835	834	823	814	799	786																														
Cu	832	844	847	854	855	853	850	844	835	826	803																													
Zn	842	861	867	881	882	890	888	888	881	877	859	840	818																											
Ga	822	845	858	875	883	894	899	903	899	901	887	870	853	832	815																									
Ge	-	847	863	885	897	913	920	931	931	936	926	916	903	889	875	857	838																							
As	-	-	833	859	876	896	909	924	931	940	936	929	921	912	903	887	872	854	834																					
Se	-	-	-	854	874	900	915	936	944	960	959	959	958	952	946	937	924	911	895	879																				
Br	-	-	-	-	838	868	890	915	932	951	955	958	961	962	961	955	946	937	924	911	898	873																		
Kr	-	-	-	-	-	857	880	911	931	957	967	976	983	987	991	989	984	979	970	963	954	934	912	888																
Rb	-	-	-	-	-	-	839	873	902	930	945	960	971	980	987	991	990	990	984	981	978	959	943	923	901															
Sr	-	-	-	-	-	-	-	-	-	927	947	964	979	992	1004	1013	1018	1020	1022	1023	1020	1010	993	978	957	935	912													
Y	-	-	-	-	-	-	-	-	-	-	-	936	955	974	990	1004	1013	1020	1022	1026	1034	1022	1016	999	987	965	949	923	903											
Zr	-	-	-	-	-	-	-	-	-	-	-	-	945	968	988	1008	1022	1032	1040	1052	1060	1053	1047	1036	1026	1010	997	977	960	936										
Nb	-	-	-	-	-	-	-	-	-	-	-	-	-	-	952	978	994	1013	1026	1045	1056	1055	1051	1045	1037	1025	1014	998	984	965	947	923								
Mo	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	966	987	1012	1030	1052	1068	1069	1068	1065	1062	1054	1045	1035	1024	1010	996	977	960							
Tc		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	938	965	988	1012	1031	1040	1042	1047	1044	1041	1036	1028	1025	1013	1004	989	977	958	943					
Ru			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	963	992	1014	1025	1034	1040	1045	1046	1046	1043	1044	1036	1030	1019	1010	997	985	969				
Rh				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	968	983	995	1007	1015	1022	1026	1027	1029	1027	1024	1020	1014	1005	997	985	974			
Pd					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1000	1011	1019	1027	1031	1036	1039	1039	1036	1031	1027	1019	1011	1000		
Ag						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	974	985	997	1005	1014	1020	1024	1027	1029	1027	1026	1022	1015	1007	995
Cd							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	969	985	997	1010	1019	1030	1036	1044	1043	1046	1046	1045	1040	1034
In								-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	943	958	977	989	1004	1013	1025	1028	1036	1041	1044	1047	1042
Sn									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	960	977	996	1010	1024	1035	1045	1054	1062	1065	1068
Sb												-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	923	947	965	984	998	1014	1025	1037	1045	1051
Te													-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	936	960	977	997	1010	1026	1036	1047
I															-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	903	923	949	965	987	999	1016
Xe																-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	935	957	978	993
Cs																	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	901	923	943
Ba																		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	888	912
La																				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ce																					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pr																						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nd																								-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pm																									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sm																										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Eu																											-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gd																														-	-	-	-	-	-	-	-	-	-	-
Tb																															-	-	-	-	-	-	-	-	-	-
Dy																																-	-	-	-	-	-	-	-	-
Ho																																	-	-	-	-	-	-	-	-
Er																																			-	-	-	-	-	-
Tm																																				-	-	-	-	-
Yb																																						-	-	-
Lu																																							-	-

Fig. 10_22. The diagram of isotopes-235U decay products (part 3)

	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
Ag	983	968																																						
Cd	1025	1014	992	963																																				
In	1040	1031	1012	988	965	938																																		
Sn	1069	1068	1052	1030	1012	987	966																																	
Sb	1055	1056	1045	1026	1013	994	978	952																																
Te	1053	1060	1052	1040	1032	1022	1008	988	968	945																														
I	1022	1034	1026	1022	1020	1013	1004	990	974	955	936																													
Xe	1010	1020	1023	1022	1020	1018	1013	1004	992	979	964	947	927																											
Cs	959	978	981	984	990	990	991	987	980	971	960	945	930	902	873	839																								
Ba	934	954	963	970	979	984	989	991	987	983	976	967	957	931	911	880	857																							
La	873	898	911	924	937	946	955	961	962	961	958	955	951	932	915	890	868	838																						
Ce	-	-	879	895	911	924	937	946	952	958	959	959	960	944	936	915	900	874	854																					
Pr	-	-	-	834	854	872	887	903	912	921	929	936	940	931	924	909	896	876	859	833																				
Nd	-	-	-	-	-	838	857	875	889	903	916	926	936	931	931	920	913	897	885	863	847																			
Pm	-	-	-	-	-	-	-	815	832	853	870	887	901	899	903	899	894	883	875	858	845	822																		
Sm	-	-	-	-	-	-	-	-	-	818	840	859	877	881	888	888	890	882	881	867	861	842	831																	
Eu	-	-	-	-	-	-	-	-	-	-	-	803	826	835	844	850	853	855	854	847	844	832	825	808																
Gd	-	-	-	-	-	-	-	-	-	-	-	-	786	799	814	823	834	835	842	839	843	836	835	823	812															
Tb	-	-	-	-	-	-	-	-	-	-	-	-	-	-	745	757	773	780	791	793	801	798	800	792	788	777														
Dy	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	730	743	756	764	775	782	787	783	785	776	773													
Ho	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	696	710	724	732	742	743	747	743	743	737												
Er	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	662	682	694	710	716	727	727	733	729	730											
Tm	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	603	622	642	655	669	678	686	693	696	693										
Yb	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	568	593	611	632	644	661	669	680	684	686									
Lu	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	539	562	584	603	621	631	646	649	651	649							
Hf	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	541	565	586	604	619	629	637	640	639	636	615				
Ta		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	485	510	535	552	570	580	592	591	595	583	572			
W				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	456	486	509	532	547	563	568	572	565	564	553		
Re					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	386	417	445	468	487	504	511	514	521	518	516	
Os						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	338	371	399	427	446	466	478	496	498	504	498
Ir							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	290	322	353	377	401	424	435	448	452
Pt								-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	236	273	307	335	368	386	406	417
Au										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	165	202	238	273	302	326	346
Hg											-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	117	160	197	230	264	293
Tl															-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	71	115	153	191
Pb																-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	71	116
Bi																					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Po																								-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
At																												-	-	-	-	-	-	-	-	-	-	-	-	-
Rn																													-	-	-	-	-	-	-	-	-	-	-	-
Fr																																-	-	-	-	-	-	-	-	-
Ra																																		-	-	-	-	-	-	-
Ac																																					-	-	-	-
Th																																							-	-

Fig. 10_22. The diagram of isotopes-235U decay products (part 4)

	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160
Ir	462	461																																						
Pt	435	441	456	453																																				
Au	368	379	398	405	413	407																																		
Hg	322	342	362	371	389	391	389	370	353	319																														
Tl	227	257	284	304	326	339	341	331	321	299	281																													
Pb	153	190	224	252	281	300	313	311	309	289	281	253	234																											
Bi	29	74	112	151	188	221	240	244	246	234	227	212	197	169	138																									
Po	-	-	-	-	-	-	185	198	207	201	203	193	193	180	177	122																								
At	-	-	-	-	-	33	60	84	103	110	123	126	135	134	143	115	80	1																						
Rn	-	-	-	-	-	-	-	-	25	45	67	79	99	110	127	116	111	43	-	-	-	-	-																	
Fr	-	-	-	-	-	-	-	-	-	-	-	-	3	22	44	50	58	28	7	-	-	-	-	-	-															
Ra	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11	35	32	48	-	-	-	-	-	-	-														
Ac	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-													
Th	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26	-	-	-	-	-	-	-												
Pa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-											
U					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
Np												-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-									
Pu														-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
Am																-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
Cm																	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Bk																		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Cf																			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Es																					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Fm																						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

According to S_calculations, the energy result of the decay reactions of the 235U isotope lies in the range from 0.11802 MeV for the pair of isotopes 12N + 223At (burst 1 mu-neutrino) to 198.5665 MeV for the pair of isotopes 104Mo + 131Sn (1069 mu-neutrinos).

Such a large number of mu neutrinos, of course, burst in a whole group of nucleons and, most likely, part of them burst directly near the "quark hoops". This leads to reactions of β-_decays associated with the NDR, and also as a result of the traveling wave, α-particles and neutrons are "shot" at the ends of the isotope nuclei. All these additional nuclear reactions in total increase the energy result of nuclear decay reactions.

We are concludes the S_analysis of the nuclear decay reactions and proceeds to the S_analysis of the reactions of thermonuclear fusion.

S_analysis of reactions of thermonuclear synthesis

An analysis of the reactions of thermonuclear synthesis (TNS) will be carried out using the example of the most known fusion of deuterium and tritium nuclei:

2He + 3He → 5He (700 * 10-24 s) → 4He + n + E_{TNS}

where E_{TNS} - is the energy result of the reaction, the ionization energy of isotopes (VP) is not taken into account.

The physical S_model of the TNS reaction consists in the convergence of the deuterium and tritium nuclei to a certain distance and with a certain orientation of their dipole moments, on which their dangling gluon "hair" (gluon flagellums) interact strongly, capture each other, and pull together all the nucleons into a single nucleus. In this case, the nucleons are compressed, the mu-neutrinos burst, they "soften" and the slotted magnets of the nucleons ("quark hoops") are tightened even more tightly. However, only 4 nucleons can contract into the bead, the fifth nucleon will assume a long and weak connection. An extremely unstable isotope 5He is formed, see Fig. 10_23.

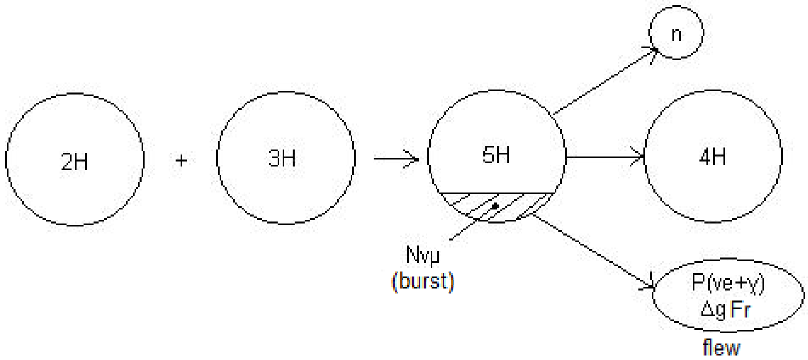


Fig. 10_23. S_model reaction of thermonuclear synthesis

We already know that only four nucleons (forming double pincers p-n-p-n) can "tighten" to the "point", and the fifth nucleon (the second neutron of tritium) hangs on the long and "frail" flagellum of gluons. This explains the extreme instability of the isotope 5He, which immediately "loses" the fifth nucleon (n_ decay) and turns into the isotope 4He.

Let's calculate the S-formulas for the thermonuclear fusion reaction (TNS):

The initial equation of the TNS

2He + 3He → 4He + n + E_{TNS}

We assume that the masses of 2H, 3H, and 4He are reference masses , and the number of mu-neutrinos remaining in them is taken from the calculation of the process of nr_nucleosynthesis in Chapter 6, it is 101, 130 and 73 mu-neutrinos respectively.

But we do not know the masses of the breakaway neutron (n), But we know that, theoretically, according to S_theory, the number of mu-neutrinos in any neutron is in the range from 9 (n_{min}) to 60 (n_{max}) mu-neutrinos, and respectively:

n_{min} = 930.08808135 MeV (9 pieces of mu neutrinos)

n_{max} = 939.5653782 MeV (60 pieces of mu neutrinos)

We modify the initial equation on the basis of the S_model of the TNS (see Figure 10_23)

2He + 3He = 4He + n + E_{TNS} = 4He + n + $\Delta N\nu_\mu$ - Δg,

where ΔN - ν_μ burst in (4He + n), Δg = g4He - g2H - g3H

We take Δg <ν^μ, then

ΔN = WHOLE ((2He + 3He-4He-n) / νμ) + 1

ΔN_{min} = 98 (νμ)

ΔN_{max} = 149 (νμ)

$N_{4He(min)}$ = N2H + N3H - Nn min - ΔN_{max} = 101 + 130 - 9 - 149 = 73 (ν_μ)

$N_{4He(max)}$ = N2H + N3H - Nn max - ΔN_{min} = 101 + 130 - 60 - 98 = 73 (ν_μ)

As we see, after the reaction of the TNS, the amount of the remaining mu-neutrinos in the 4He isotope is equal to the number of mu-neutrinos in the same isotope after the nr_nucleosynthesis process and is independent of the number of mu-neutrinos that have flown away in the breakaway neutron.

We calculate the increase in the mass (energy) of gluons, as the difference in the reference mass of the 4He isotope and the calculated mass of the 4He isotope formed, without new gluons_SIF ($4He_{\text{calc without }\Delta g}$).

$4He_{\text{calc without }\Delta g}$ = 4 * 60 ν_τ + 73 ν_μ + 2 (2u + d) + 2 (u + 2d) + 2e- + gU_{235} = 3728.26488967 MeV

Δg = 4He - 4He $_{calc\ without\ \Delta g}$ = 0,13627011 MeV
The energy result of the reaction of the TNS at ST.
$E_{TNS\ min\ ST} = \Delta N_{min} * \nu_{\mu} - \Delta g$ = 18,07500619 MeV
$E_{TNS\ max\ ST} = \Delta N_{max} * \nu_{\mu} - \Delta g$ = 27.55230304 MeV
According to the reference data from the literature, the energy result (according to SM) of the synthesis of one 4He atom from 2H and 3H isotopes is of the order of 14.1 MeV, which is about 4 MeV less than the lowest possible in S_theory, and the simplest verification calculation (in SM), as a difference masses of isotopes before and after the reaction:
$E_{TNS\ SM}$ = 2He + 3He - 4He - n = 18.1467842 MeV
Not being experts in nuclear reactions, we can not undertake to explain the reason for this discrepancy, it is possible to take into account in the reference data energy costs for "kindling" and maintaining the work of a thermonuclear boiler.

The difference and "similarity" of the processes of primary nr_nucleosynthesis of the spectrum of isotope atoms and the process of thermonuclear synthesis (TNS)

Above, in Chapter 4, we persistently, several times, used the definition of "primary" nr_nucleosynthesis.
In this way, we wanted to emphasize the fundamental difference between the process of nr_nucleosynthesis from the process of thermonuclear synthesis (TNS) and the fact that the primary synthesis of the entire spectrum of isotope nuclei (the entire Mendeleyev table) was through the process of nr_nucleosynthesis, rather than the TNS. Moreover, the entire process of primary nr_nucleosynthesis took place in the cosmological (pre-stellar) phase of the existence of the universe.
The process of TNS in the question of the formation of the spectrum of isotope atoms is secondary, it "ignites" after the formation of the first stars and "recycles" the lighter isotope nuclei into heavier isotopes, by merging them.
The process of primary nr_nucleosynthesis of the spectrum of isotope nuclei differs significantly from the process of thermonuclear synthesis (TNS).
The main difference between these processes is that the process of nr_nucleosynthesis is a "natural" method of successively attaching relic neutrons to the nucleus of the previously formed isotope. This process does not have an internal antagonism, as in the TNS, associated with the electrostatic repulsion of positively charged nuclei. The only "external" limitation of the process of nr_nucleosynthesis is the presence of free relic neutrons.
Relic neutron, as a powerful catalyst, due to its "complete holder" of mu-neutrinos (61 pcs.) and "constant readiness" to give away some of them, is able to join any nucleus of any isotope that met on its way.
The process of nr_nucleosynthesis, to some extent, can be attributed to the "notorious" cold synthesis, as theoretically, it does not require either increased temperature or increased pressure. Although this does not mean that these parameters at the stage of nr_nucleosynthesis were "normal".
In the processes of thermonuclear fusion (TNS), relict neutrons do not participate, therefore these processes require special external conditions (high temperature and high pressure) to carry out these reactions.
It is known that for the initiation of a thermonuclear reaction, the temperature of a mixture of isotopes of deuterium and tritium is required to be 10^8 K^o. Such a temperature can currently be obtained only as a result of explosive compression of the mixture, which is the basis of thermonuclear bombs.
In installations of controlled thermonuclear fusion such a temperature has not yet been achieved, although according to recent data, physicists have already come close to this plasma temperature. The Chinese reached a plasma temperature of 50 million K^o for 102 seconds, Koreans 70 million K^o for 70 seconds, and Germans 80 million K^o for 0.25 seconds.
The problem of achieving and maintaining a temperature of 100 million Ko is now the main one in the projects for triggering the controlled reactions of the TNS, we will try to make our contribution to the solution of this problem.

S_analysis and the search for a solution to the problem of nuclear compression to distances of strong interaction

To start a thermonuclear reaction, the positively charged nuclei (q1 and q2) must be brought closer to the distance r, at which the forces of strong interaction begin to act, see Fig. 10_24.

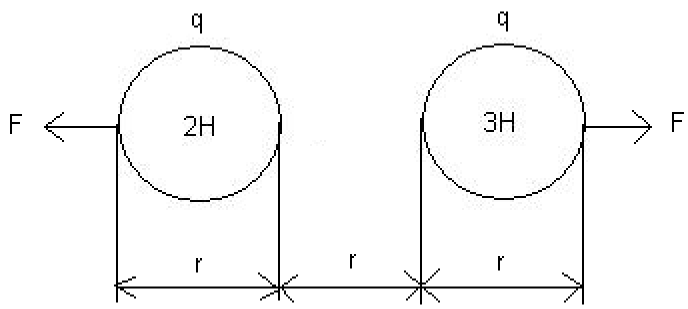


Fig. 10_24. The "ignition" scheme for traditional thermonuclear fusion

The compression forces of the nuclei must overcome the force of electrostatic repulsion of the nuclei equal to
F = q1 * q2 / r2.

The idea of reducing the repulsive force of nuclei, in which the forces of strong attraction begin to act, is taken from the reactions of nr_nucleosynthesis and consists in an attempt to use the dual symmetry of neutrons. On the one hand, neutrons have exactly the same ability to form strong bonds, like protons, on the other hand they are electrically neutral and do not experience electrostatic repulsion when approaching positively charged nuclei or protons.

The physical realization of this idea is to propose "injecting" the neutron gas into the deuterium and tritium plasma heated to the temperatures indicated above, already achieved in the experimental setups.

Neutrons, distributed between the nuclei of deuterium and tritium, can act as a catalyst for the onset of the action of strong interaction forces at large distances between isotope nuclei, see Fig. 10_25.

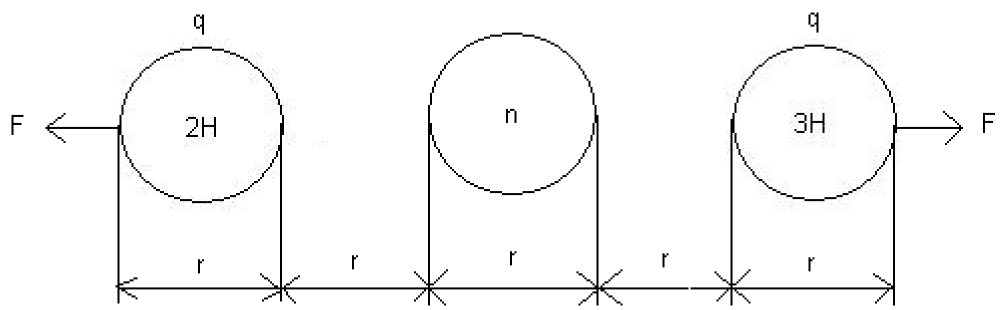


Fig. 10_25. Modified scheme for "ignition " a thermonuclear "boiler"

In this scheme, the forces of strong interaction between all three objects begin to act at a distance of about 3r between the nuclei of the isotopes of deuterium and tritium, and the force of electrostatic repulsion between them will decrease nine fold. Those. the initial temperature of triggering a thermonuclear reaction can be significantly (almost by an order of magnitude) reduced.

<u>Of course, there are two additional problems:</u>

<u>The first problem</u> is the process of a simultaneous reaction involving three objects. We ourselves proclaimed the principle that limits the number of objects participating in one physical event to no more than two.

However, we already had a "precedent" when three blocks of simples participated in the formation of a relic neutron. True, this happened, presumably, at very high temperature and pressure, but in the reactions of the TNS they are also not small. Moreover, this scheme assumes a certain probabilistic nature of the implementation of such reactions, which are necessary only to "ignite" the thermonuclear "boiler." Further reactions after raising the temperature can follow the traditional scheme.

The second problem is the violation of the alternation of nucleons necessary for the formation of "double clamps " (p-n-p-n or n-p-n-p).

The traditional scheme of the combination of deuterium and tritium gives an alternation of nucleons p-n-p-n-n, with the subsequent "rejection of the last neutron. As result "double clamps" are formed.

The proposed scheme gives an alternation of nucleons p-n-n-p-n-n, which, when the latter two neutrons are discarded, gives "single clamp" with two neutrons in the middle.

It seems to us that the energy result of the modified scheme (even with the formation of "single clamp") will suffice for "ignition " a thermonuclear "boiler".

PS:

We believe that in the traditional models of the TNS not investigated (or rather ignored) the possible role of "free" neutrons, capable of also giving away some of their mu-neutrinos and acting as catalysts for a thermonuclear reaction. For some reason, specialists in the TNS completely "forgot" about the presence of free neutrons generated by an atomic fuse during a thermonuclear explosion. And there are enough free neutrons on the Sun too, but their role in thermonuclear reactions is somehow "not taken into account."

Perhaps the problems of realizing the reaction of controlled thermonuclear fusion, which have not been solved so far, are due to the absence of free neutrons in the TOKAMAK (ITER), and to solve the problem of "ignition " a thermonuclear "boiler", one does not have to "chase" the super values of the temperature parameters and pressure, but simply dosed "inject" free neutrons into the "boiler" of the TNS as a reaction catalyst.

Let this issue is decided by specialists in the creation of a controlled TNS.

S_Model of formation of neutron stars and black holes at the site of a supernova explosion

The theory of the explosion of supernovas is well worked out. It is known that from the remnants of matter after the supernova explosion, the formation of two exotic objects is possible. If the supernova mass was greater than 1.4 times the mass of the Sun, a neutron star (NS) is formed. If the mass of the supernova was more than 20 solar masses, a black hole (BH) is formed. The above estimates of masses in different sources differ, we have chosen the minimum and maximum.

Let's try to construct S_model of the processes of formation of NS and BH.

S_Model of formation and structure of a neutron star (S_Hypothesis)

Explosions of supernovae and the formation of neutron stars in their place occur in our time (in our Cosmological epoch). These processes occur at the nuclear level, so we are conducting their S_analysis in a chapter on modern nuclear reactions.

We will not consider the causes that lead to the explosion of supernovas (they are very well developed in the SM), we will begin our investigation immediately after the explosion of supernovae and the subsequent formation of a neutron star.

At the time of the supernova explosion, a huge amount of energy is released. Where does it come from? It seems to us that in this case a special kind of nuclear reaction takes place, as a result of which all the extra mu neutrinos burst in all nucleons and only 9 pcs mu-neutrinos remain in each nucleon. At the same time, there is enough energy are stands out to destroy all the bonds between the nucleons (all the nuclei decay into protons and neutrons.

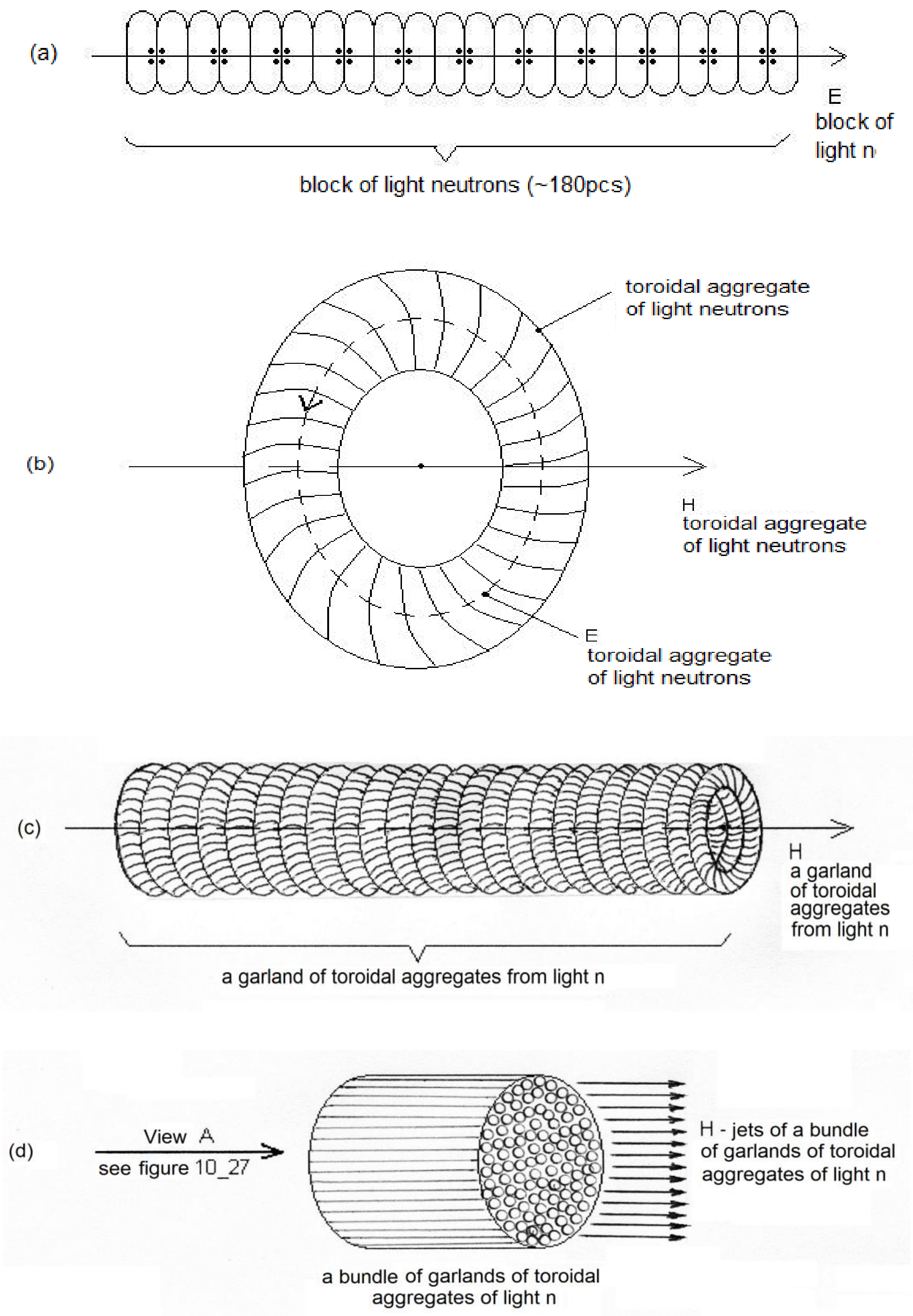
The explosion itself occurs within a certain limited volume occupied by the supernova, and the released energy creates a colossal pressure in this volume, which leads to the "squeezing" of electrons into protons and their transformation into neutrons. The scattering of matter after a supernova explosion takes place already in the form of a cloud of neutrons, electron neutrinos, gamma quanta, free gluons, and secondary photons.

<u>At the second stage</u>, the neutron scattering decelerates by the force of gravitational attraction and neutrons again begin to assemble into a "pile". It is clear that this process is not so fast, and the question arises - why do not free neutrons decay?

The fact is that all the neutrons produced contain only 9 mu-neutrinos (we will call them light neutrons). Such light neutrons have an increased "softness", the remaining mu-neutrinos in them can unfold, relatively speaking, almost 90 °, they are uniformly distributed along the length of the "quark hoop" and no one squeezes into the gaps between the quarks.

Such light neutrons, as well as protons, can exist forever, or almost forever.

<u>At the third stage</u>, the light neutrons that flock together into the "heap" begin to attract each other under the action of their dipole moments, and then, at a certain distance, slit magnets enter the work (they did not disappear anywhere) and "dangling" of them flagellum gluons_SIF (hair) are connecting to each other and pull together neutrons into fairly long coaxial blocks. In this case, inside all these neutron blocks, a dipole moment is formed along their axis, equal in magnitude to the sum of the dipole moments of the neutrons, see Fig. 10_26 (a).



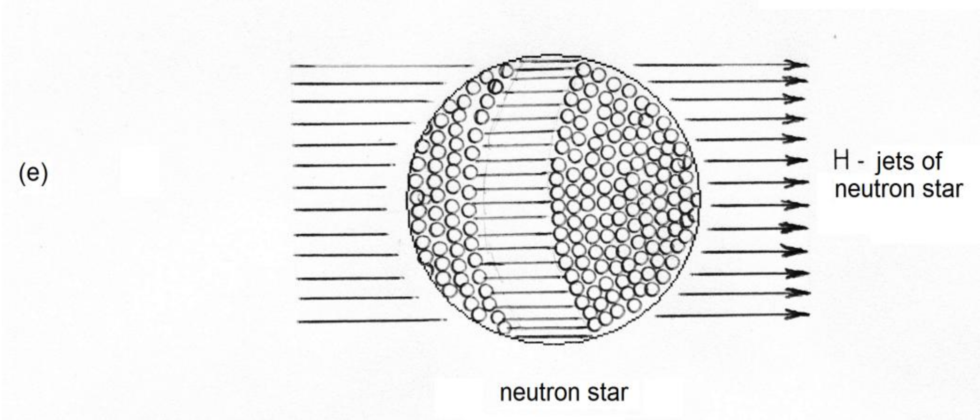


Fig. 10_26. S_model of the formation of the neutron star

When typing a sufficient length of neutron blocks, under the effect of attraction of the dipole moment poles, the blocks are folded into toroidal aggregates (bagels). If we take as the basis the magnitude of the kink of the axis in the "bend" and "tangles", calculated by us in Ch. 5 (2^o), 180 neutrons should be assembled to form a donut (360o). The resulting toroidal aggregate has a "flat" shape, in contrast to "bend" and "tangles" of isotope nuclei, which in addition to neutrons also contain protons.

The dipole moment inside the torus of such an aggregate closes and forms an electric vortex that generates a new magnetic moment passing through the center of the aggregate and perpendicular to the plane of the torus, see Fig. 10_26 (b).

The newly appeared magnetic moments of toroidal aggregates orient them among themselves and collect them, like rings of children's pyramids, into a single "garland". The lengths of the "garlands" are limited by the "strength" of their assembly, see Fig. 10_26 (c).

All the "garlands" formed under the action of their magnetic moments are orienting in one direction, and under the action of gravitational attraction forces they are assembling into a single common "bundle of garlands" (neutron star are formed). The magnetic moments of all "garlands" have one direction and form a powerful internal magnetic field of the neutron star, which escapes from two magnetic poles of the neutron star in two opposite directions in the form of two powerful jets, see Fig. 10_26 (d).

Like any cosmic structure formed as a result of a conglomeration of smaller elements, the neutron star at the moment of conglomeration acquires a mechanical moment (rotates). Gravitational and centripetal forces "shape" the neutron star and give it the shape of a sphere. Individual "garlands" are torn and regrouped, forming a "bundle of garlands" inscribed in the spherical shape of a neutron star, see Fig. 10_26 (e).

This S_model of formation of neutron stars explains the presence of a powerful magnetic field in them, the vector of which may not coincide with the vector of the mechanical torque of rotation of the NS. As a result, for an external observer such a neutron star will look like a pulsar (magnetite), with a pulse frequencies equal to the neutron star rotation frequency.

Density of neutron stars

In the formed S_structure of the NS, there are no electrons that, in the state of matter in the form of atoms, limit the minimum distance of atom compression by the interaction (repulsion) of their electron shells.

There are no electrons in the NS, so the NS density should be close to the nuclear density (~ 10^{14} g / cm^3). We will estimate the density of NS in accordance with the proposed S-model.

The entire volume of NS consists of tightly packed torus aggregates, see Fig. 10_26 (b), containing 180 light neutrons (with the 9 mu-neutrino). The mass of such a toroidal aggregate (TA180n) is equal to:

m_{TA180n} = 180 * 930.088 = 167415.855 (MeV)

We take the length of the circumference of the aggregate (along the midline of the tau-neutrinos forming the inner circle TA) equal to the size of 180 neutron donuts densely pressed together, see Fig. 10_26 (a):

L_{TA180n} = 180 * 0.4274 = 76.94 (fm), where 0.4274 is the neutron thickness in ST (D tau-neutrino)
Then the outer diameter of the toroidal aggregate will be:
$D_{TA180n} = L_{TA180n} / 2\pi + 2D_{tau\text{-}neutrino} + D_{hole}$ ~ 13.57 (fm), where
D_{hole} = 0,022 (fm) - hole in the neutron (by ST)
Approximate the toroidal aggregate with a cylinder and calculate its volume:
$V_{TA180n} = h * \pi * D_{TA180n}^2/4$ = 126.83 (fm3), where
h = Dn = 0.8768 (neutron diameter in accordance with ST)
We calculate the density of NS equal to the density of the toroidal aggregate:
$\rho_{NS} = m_{TA180n} / V_{TA180n}$ = 167415.855 / 126.83 (MeV / fm3) ≈ $2.5 * 10^{15}$ (g / cm^3)
This estimate of the density of NS is, in our opinion, minimal. There are a number of factors that can work to increase this density:

1. Twisting of neutron garlands into toroidal aggregates breeds neutron bagels on the outer circumference of toroidal aggregates in a fan, this allows neutron donuts to partially encroach between neutrino bagels of the neighboring aggregate, which reduces the volume of the neutron star.
2. There is a potential for deformation of toroidal aggregates when compressed their into hexagons, which will lead to their denser packaging and also reduce the volume they occupy.
3. In our calculations, we used the bending of the axis of the neutron block, when it was twisted into a toroidal aggregate equal to 2^o, it can be assumed that the bending of the axis in the toroidal aggregate NS can be greater, for example, 3°. In this case, the toroidal aggregate will consist of 120 neutrons. The recalculation of the density of NS consisting of such toroidal aggregates gives a value of $3.2 * 10^{15}$ g / cm^3.

Taking into account these factors, it can be expected that the actual density of NS is probably somewhat higher than our calculated values and closer to 10^{16} g / cm^3, which corresponds to the last estimates of the density of NS, see [16].

S_Model of formation and structure of the Black Hole (v2.2 dated Dec. 31, 2017)

"It's hard to look for a black cat in a dark room", especially if it's impossible to enter. This truth is confirmed once again by an attempt to construct an internal model of the Black Holes, a "look" inside which by experimentally is not possible. We attempted to "forecast" the internal structure of BH, starting from the proposed structure of NS and the possible processes of its transformation to BH under super strong gravitational compression of NS. In this case, we took into account the known external parameters of BH - the horizon of BH events and the presence of jets.
A definite value for determining the BH structure is the question of possible participation in the formation of BH of Dark Matter (the BH growth stage is meant, since in the original NS, Dark Matter is absent). An additional essential circumstance that must be taken into account when constructing the internal structure of BH is the need to take into account a number of "moments" associated with the participation of black holes in a number of processes, namely:
A) the preservation in the BH of all electric charges (azimuthal electric vortices) of the original simples of matter and the Dark Matter from which the BH was formed;
B) at the gravitational level, the BH mass must equal the sum of the masses of the original simples (minus the mass defect in the formation of BH);
B) When BH bursting, a powerful magnetic flux must be formed, stretching the virtual photons into simples.
As a result, we have three variants of S_models of black holes, formed from a massive NS. Chronologically, the first version of the single-bagel S-model BH was proposed by us in the first edition of S_theory (v1.0 of 23.06.2017). The second version of the two-bagels S-model BH was proposed by us in the second edition of S_theory (v2.0 from 27.11.2017). As a result of the release of new data on the distribution of Dark matter inside galaxies [35], we were forced to return to the S_model of BH issue again, as a result, we returned to the 1st version of the single-bagel S_model of BH (v2.1 from 30.11.2017). And at the end of December, when we were translating S_theory into English, we found another inaccuracy in the S_model of BH, which resulted in the appearance of the 3rd S_model of BH (v2.2 from 31.12.2017), which is a modification of the 1st variant.

Taking into account that the editions of S_theory (v1.0, v2.0, v2.1) were "released" (the process of promotion of S_theory began), we are forced to save in the edition of S_theory v2.2 a description of all three variants of S_models of BH with an explanation of the reasons their consequential modification.

Basic the first version of the S-model of the formation and structure of the Black Hole (1st ed. ST of 23.06.2017)

We have already stated (it was suggested) that the Black Hole (BH) is a large simple (large bagels-torus), in which a powerful magnetic vortex is spinning inside the torus, and the torus surface is formed by powerful toroidal electric vortices.

Let's not go into details now, how we created such a hypothesis, try to test it by conducting an S_analysis of the possible process of BH formation from NZ (or rather, in the continuation of the NS formation) after a supernova explosion with a mass of more than 20 solar masses.

Considering the S_process of formation of NS, we "established" that as a result of this process a deterministic structured construction is formed, which we figuratively compared with a children's pyramid ("garland") - a set of toroidal aggregates formed from neutron blocks and are stringed on their common magnetic vector. And the whole NS consists of a set of such "pyramids" tightly pressed together and having the same orientation (the same direction of the magnetic vortices), see Fig. 10_26.

<u>The process of transition of NS to BH.</u>

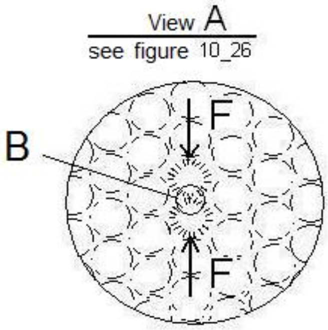
The density of matter in the NS described by us is comparable with the density of nuclei, but the overall size, due to the neutral charge of all aggregates-components, considerably exceeds the dimensions of all known nuclei. And this means that inside the structure there is a colossal gravitational force of compression.

The entire force of gravitational contraction in such a design falls on the garlands of neutrons, and ultimately on the external simples of neutron tau-neutrinos, see Fig. 10_27 (a, b). Tau-neutrinos have a finite strength, and can be bursted with a bend less than the critical radius (as well as a mu-neutrino). Therefore, there is a certain limiting mass of NS, above which the gravitational force of compression of neutrons leads to the destruction of their tau-neutrinos. The process of destruction of tau-neutrinos begins in the central region of the NS, see Fig. 10_27 (a). Bagels of tau-neutrinos are first compressed into ellipses, see Fig. 10_27 (b), and then bursts and unfolds into symples-spirals, see Fig. 10_27 (c). The same thing happens with the mu-neutrino and with the quark hoop. Due to the presence of gaps, the quark hoop is scattered into individual quarks.

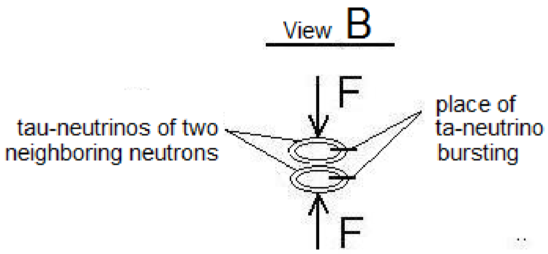
We must not forget that the bursting of bagels of simples and the formation of simple-spiral takes place under conditions of a powerful magnetic field inside the NZ. Under its influence, all formed simple-spirals (having their own internal magnetic field) acquire the same orientation. It should be noted that before simple-spirales will unfold along the magnetic field NS they its magnetic vortices are burned simples-bagels tau-neutrinos neighboring neutrons. Those immediately repeat their "destiny" - the process occurs avalanche-like and ends when all simple-bagels are busted in simples-spirales and forms the tufts of simple-spirales of the first type, see Fig.. 10_27 (d). The length of the tufts is equal to the diameter of the NS. The role of "screeds" of this tufts is still played by gravitational compression forces.

Next is the process of combining the tufts of simple-spirales of the first type into the simple-spirales third type (which we will describe below) and folding the latter into a simple-bagel of the third type (Black Hole). See Fig. 10_27 (e, f, j).

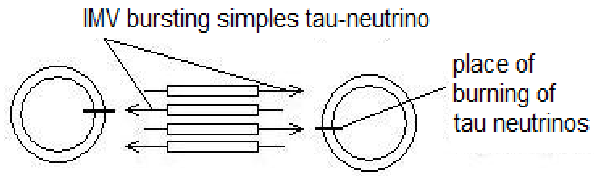
(a)



(b)

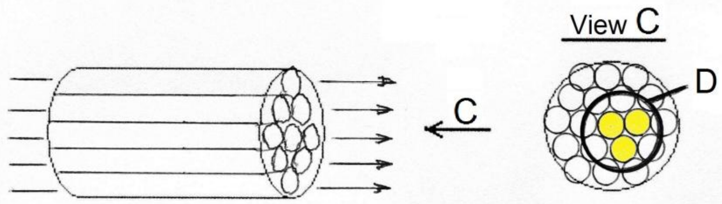


(c)



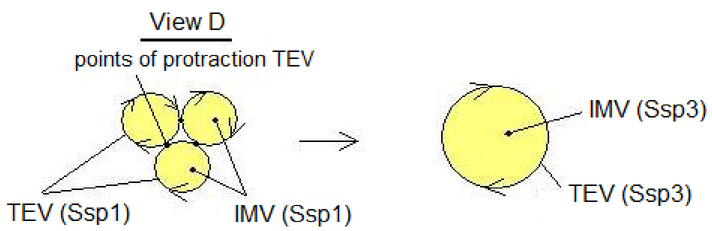
the burning of simples of tau neutrinos in neighboring neutrons

(d)



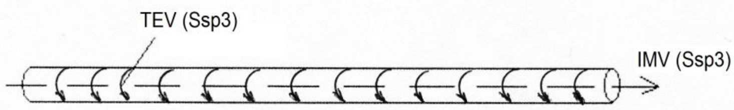
the formation of a beam of long blocks of simples-spirales

(e)



protraction of differently directed TEV simples-spirals 1 kind
formation TEV simples-spirals 3 kind

(f)



Ssp3 (side view)

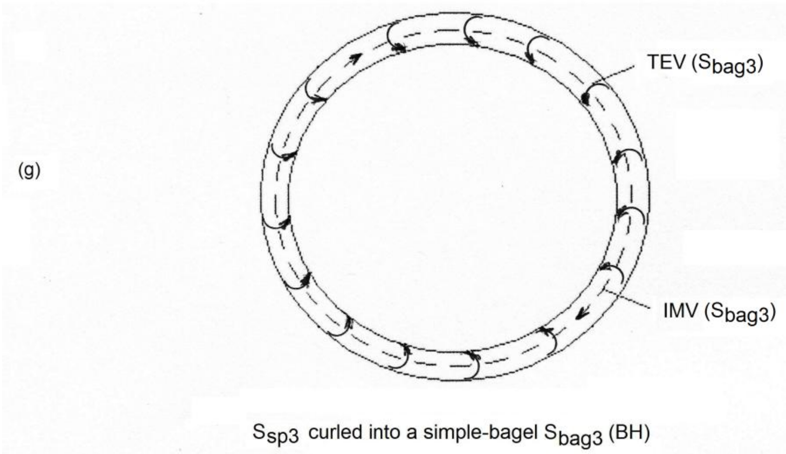


Fig. 10_27. S_Model of Black Hole formation

Remark 1:
Here we must give a substantial observation. In the first edition of the S_theory (dated June 23, 2017), we wrote that bagels of tau-simple (tau-neutrinos) burst with a diameter in half in the case of gravitational compression. Now we have changed the model of this step of the process and assert that bagels burst in one place, see Fig. 10_27 (b). What is the difference between these options, and how important is it? Let's answer this question:
In the beginning our work, we stated one of the principles of S_theory - in one local place at one time only one event can occur. It is on the basis of this principle that we believe that the tau-simple are bursting first occurs in one place, as a result of which the simple-bagel turns into a simple-spiral and avoids bursting in the second place. How important is this change in the model? Would bursting a simple-bagel in two places, two simple-spirals would form - what's the difference?
The difference is very significant. The fact is that when a simpl-bagel is broken into two halves (which, incidentally, we have not seen so far), there would arise one "sharp" question - and what happens with the electric charge of the simpla-bagel. The logical the answer is that it is will be divided in half. But then the charge of the simples-spiral would become equal to 1/12 of the charge of the electron. But we postulated that the charges of all the simples are 1/6 of the electron charge, and that the charges of the simples do not depend on their length. In accordance with this postulate, in education two symple-spirals with charges 1/6 the total charge should have doubled, or it was necessary to abandon the constancy of the charges of the simples and proceed to the dependence of the magnitude of the charges on the length of the simples (from this we declined in the first chapter when parsing the properties of simples). In both cases, the structure of all S-models "falls apart" and is subject to revision. No, the S_theory itself with respect to the physical model of the creation of simples can still be preserved, and it is possible that by introducing the dependence of the simples charge on its length it is possible to construct new S-models of elementary particles and nucleons whose parameters can be reconciled with their reference data. In this connection, we want to note the particular urgency of conducting an experiment on the formation of electric charges in the interaction of orthogonal electric vortices and determining the amount of charges formed and their dependence on the experimental parameters. Of course, after "living" in the environment of simples for five years, we now with a smile look at our scheme of the experiment on the proof of the formation of an electric charge by the toroidal and azimuthal electric fields of the solenoid, which we showed in the first chapter. We will not remove this scheme, we will leave it as a "memory", but note that this experiment should be carried out most likely on the basis of Abrikosov's vortexes, as Fedor Fedorovich Mende did [2].

Remark 2: The transition of the tufts of the simples-spirales of the 1 type to the simples-spirales of the 3 type.
The transition of a substance to a new state does not stop with the formation of tufts from simples-spirales of the 1st type. Pressing toroidal electric vortices of simples-spirales to each other has its consequences. Let's recall the "Safety Technique" constructing aggregates from simples.

In our tufts the internal magnetic vortices of all the simples-spirales have one direction, as a result of which the toroidal electric vortices of the neighboring simples-spirales at the point of contact with each other will have the opposite direction. This will lead to their rapid "wiping" at the point of contact and unification into a single toroidal electric vortex, see Fig. 10_27 (f). Accordingly, their internal magnetic vortices will also unite.

Thus, within the NS, the process of transition of local tufts of simples-spirals of the 1st type into simple-spirals of the 3 type (large simples) begins. Until now, we have not observed this process, until now the simples have been combined into blocks only longitudinally (along the axis). A new form of the "transverse" union of the simples-spirals with the same direction of the internal magnetic vortices is due to the presence in the neutron star of entirely new conditions, the main of which is the extremely strong pressure.

The process of combining simples-spirals of the 1st type goes on until one large simple-spiral of the third type is formed. The density of matter in the large simple is probably much higher (it has its own new resonance states of vortices). As a result of, the diameter of its toroidal electric vortices decreases. This leads to the fact that under the influence of its magnetic poles, the simple-spiral of the third type is folded into a large simple-bagel of the third type . A black hole has formed, see Fig. 10_27 (g).

Three variants of the formation of azimuthal electric vortices of black holes.

The question of the formation of azimuthal electric vortex BH is the same issue in which we are a little "lost", resulting in the emergence of three S-models BH. Analyzing the chronology and options for solving this issue with the "back mind", we understand that our "throwing" was associated with an inadequately established technique for analyzing physical processes in the micro world at the level of electric and magnetic vortices (on the Theory of Interaction of Electric and Magnetic Vortices). Even we, the proponents of a new (vortex) approach to parsing physical processes, could not immediately reach a "right" decision. Let us cite all three variants of S_models for the formation of azimuthal electric vortexes of BH, as an illustration of the correct and incorrect application of the TEMV provisions.

1-st variant S_model of the AEV_BH formation (v.1.0 from 06/23/2017)

When analyzing the process of the formation of BH from the NS, the question - where the "charges" of the simples. Filling this "gap" we will say that when the neutral NS is compressed to BH, all the opposite electric charges (rather, the opposite electric azimuthal vortices), say softly, are "compensated". The process of "self compensation" of AEV is explained by the transverse, rather than longitudinal, union of simples-spirales into blocks. When longitudinal joining of the simples-spirales into blocks at the junction of the ends of the simples-spirales with different charges, a short circuit occurs, leading to annihilation of simples. When of transverse merging, all simples-spirales of the 1st kind are squeezed into "bundles" with gaps between their ends (as in the quark hoop). In this case they can not reach each other with their ends , such a large force compresses them and so rapidly passes the fusion process simples-spirales of the 1st kind into the simple-spirale of the third kind. All the azimuthal electrical vortices of the simples-spirales of the 1st kind are assembled on the "surface" of the toroidal electric vortex of the simple-spirale of the third kind and compensated for (disappearing). As a result, the formed black hole was obtained electrically neutral (without an azimuthal electric vortex).

And where are the jets? - the reader will ask the reader who has "guessed" past a long time that in S_theory jets of black holes are connected with the azimuthal electric vortices of the black hole. The answer to this question is related to Dark Matter.

In the next chapter, we will discuss the matter of Dark Matter in detail. In it, we will calculate the total ratio of the number of all simples formed, calculate the number of similes "spent" for the formation of substance, and determine the number of simples remaining in the Dark Matter.

Looking ahead, we will say that the results of these calculations show that, in the process of simples formation, quantity of negatively charged simples formed more than quantity of positively charged simples. This is due to the asymmetry of the formation of simples from virtual photons with different orientations of their magnetic vector. We have already touched upon this feature when analyzing the process of appearance of the simples property-a positive and a negative charge. What does the preponderance of negative simples over positive simples?

Firstly - for the substance it means nothing. In the formation of relic neutrons, an equal number of positive and negative simples participated. As a result, the whole substance turned out to be electrically neutral.

Secondly, all the excess of negatively charged simples has gone to Dark matter, as a result of which it has acquired an uncompensated negative charge, and for this reason of particles of Dark matter forms a halo around galaxies.

Accordingly, there are two options for the formation of Black Holes - with and without the participation of Dark Matter.

Above we disassembled the variant of BH formation without the participation of TM.

The picture changes somewhat if Dark matter, which has an uncompensated negative charge, participated in the formation of the black hole. In this case, the "self compensation" of the charges (azimuthal electric eddies) on the surface of the simple-bagel of the third type will end with the termination of the positive charges, and the excess of negative charges will remain. It's more correct to say, there will remain "uncompensated" azimuthal electric vortices, generating a negative charge, which eventually will gather into a single azimuthal vortex on the inner circumference of the BH torus. This vortex will lead to the appearance of a negative charge in the black hole and the formation of a magnetic moment perpendicular to the plane of the BH torus.

2-nd version of the S_model of formation AEV_BH (v.2.0 from 27.11.2017)

Criticism of the first variant S_model of formation the AEV_BH

The first variant of the S_model of AEV_BH formation initially contained a small "wormhole" associated with "self-compensation" of the azimuthal electric vortices of the original simples of first-kind when they were combined into a third-kind simple (BH). After all, each vortex is a carrier of energy, and where did this energy "go"?

Our "mistake" was aggravated in the "future" when we began to study in detail the S-model of the Unified vortex field theory (Chapter 11).

We again have to "run ahead" and set out the main provisions of the future sections of S_theory. So everything in it is interconnected by a kind of "mutual guarantee", which we attribute to the merits of S_theory, reflecting its complex approach, linking different areas of physical reality into a single whole.

The basis of the S-model of the Unified Vortex Field Theory (EVFT) is the provision on the representation of the lines of force of static fields in the form of flagellumss (garlands) of virtual photons or gluons, as we have already described in the sections of S_theory devoted to the construction of S-models of particles and their combination into nucleons and isotopes. This S-model should not be confused with the S-model of dynamic electromagnetic fields, the carriers of which are real photons. This difference in S_theory is fundamental.

The analysis of the "mechanism" of the interaction of virtual-photon flagellums (carried out in Chapter 11) between charged and neutral bodies has one most important consequence about the hysteresis (excess) of the duration of the pulses of the attraction of the different polar poles of virtual-photon flagellums above the duration of pulses repulsing unipolar poles of virtual-photon flagellums. The presence of such a hysteresis makes it possible to explain the forces of the gravitational interaction between neutral bodies by the forces of electromagnetic interaction of the flagellums of virtual photons between the electric and magnetic charges of the simples composing these bodies.

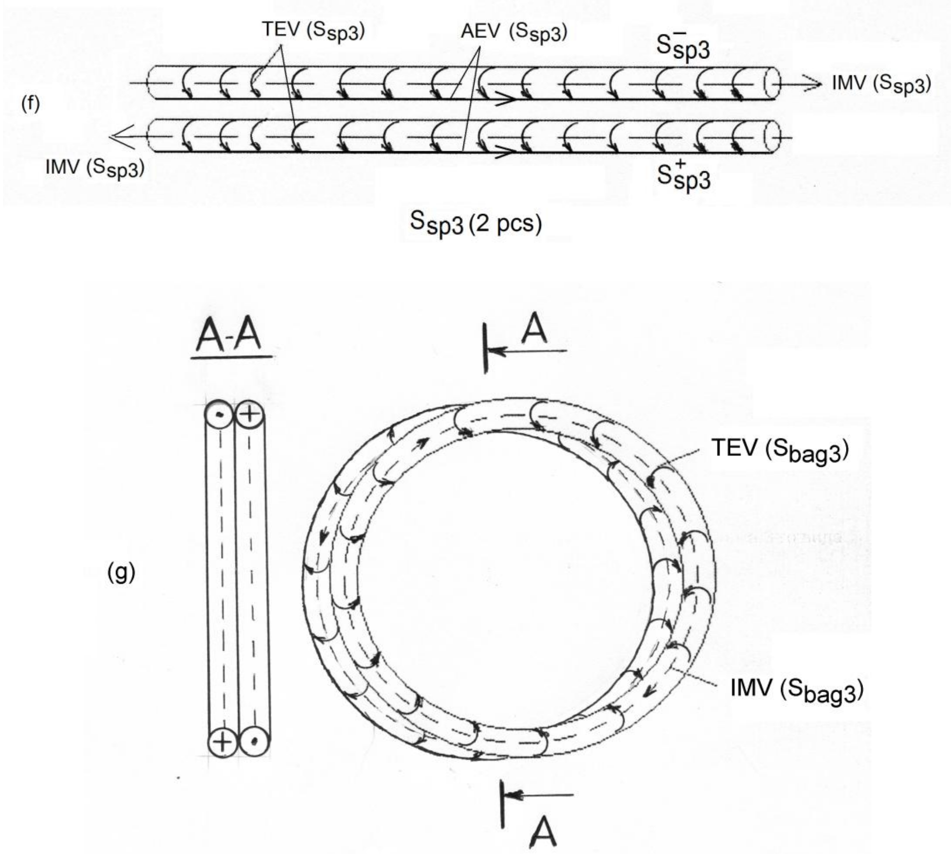
Without going into a more detailed analysis of the given provisions of the EVFT (we will do this in Chapter 11), we recall that the "carriers" of electric charges are the azimuthal electric vortices, they also generate magnetic moments (charges) of simples, incl. and simples-bagels of the third kind (BH). Ie, in other words, simples that do not have azimuthal electric vortices can not participate in the electromagnetic and gravitational interactions (!)

It turns out that the first version of the S_model of AEV_BH formation, leading at the first stage to the formation of a black hole from an NS without an azimuthal electric vortex, excludes such a black hole from the gravitational interaction, which is nonsense.

The construction of the second variant S_model of the AEV_BH formation (v.2.0 of 27.11.2017)

The "error" in the first version of the S_model AEV_BH formation was discovered by us in November 2017 when preparing the second edition of the S_theory.

With an additional S_analysis of the BH formation process and the role of the azimuthal electric vortices of the original simples-spirales of the 1st kind in the given process, we paid attention to the fact that the grouping (move) of the first-kind simples-spirales (possessing electric charges) into a single beam occurs under conditions of a strong magnetic field NS. This circumstance should lead to the separation of the first-kind simples-spirales with different electric charges into two groups, i.e. on two beams, from which two simples-spirales of the third kind are formed, which in turn will be folded into two simples-bagels of the third kind. Possessing opposite electric charges, these two simples-bagels of the third kind are "glued together", in analogy with the tau- and mu-neutrino bagels, see Fig. 10_28, in which we give only the last two stages of the formation of BH - (e) and (j).



Simples-spirals of the third kind are folded into two simple-bagels of the third type

(the azimuthal electric vortices are not shown conditionally)

Fig. 10_28. S_model of formation of a two-bagels black hole

As a result, we have formed a two-bagels S-model of the Black Hole, which possesses all the azimuthal electrical vortices of the original simples-spirales of the 1st kind, generating a powerful magnetic moment (vortex) of BH, regardless of the participation or non-participation of Dark matter in the formation and growth of the Black Hole.

Such a black hole, from the point of view of the EVFT, integrates in itself all types of electromagnetic and gravitational interaction of all objects from which it was formed.

3-rd variant S_model of the AEV_BH formation (v.2.2 dated December 31, 2017)

It turns out that with the 2nd version of the S_model of AEV_BH formation, we also "hurried", or rather, made another "mistake". We found it pretty quickly, after 3 days, although during this time S_theory with the index "v2.1 from 30.11.2017" managed to "go" to several addresses.

"Error" is the following - the two-bagels S_model BH assumes:

- the same direction of azimuthal electric vortices (AEV) on both BH bagels,
- respectively, the same direction of the vectors of the magnetic moments (vortices) generated by the AEV,
- the same direction of toroidal electric vortices of two BH bagels along the line (circle) their contact (observance of safety engineering),
- and the opposite direction of the internal magnetic vortices inside the BH bagels.

The latter circumstance "cuts to the root" the second variant of the S-model of the AEB_BH formation. The fact is that one of the main "functions" of the black hole is to stretch the virtual photons into simples-spirals when bursting super_BH. In the case of a two-bagels S_model, this is not possible in principle. The magnetic fluxes that escape from the two bursting BH bagels will have the opposite direction and "compensate" each other. For this reason, we reject the two-bagels S-model BH, in spite of the fact that it provides integration of all kinds of interaction of the initial objects that formed BH.

What to do? At this the moment, the results of a new study by a team of scientists headed by David Massari from the Astronomical Institute of Kaptein, The Netherlands, "have arrived" in which they established that dark matter in the galaxy is distributed with increasing density of distribution toward the center of the galaxy [38].

This gave us grounds to return to the first variant of the S_model of AEV_BH formation, believing that BH are formed with the direct participation of TM, which gives them an azimuthal electric vortex and the possibility of participation in all types of interaction. As a result, at "light" appeared S_theory v2.1 from November 30, 2017, in which we returned to the 1st variant of the S_model AEV_BH formation .

But the "sediment" remained, it turned out that the black holes formed according to the first variant of the S_model of the AEV_BH formation are somehow "inferior", they have "lost" the azimuthal electric vortices of the original neutral objects and only the azimuthal electric vortices corresponding to the excess of the negative charge in Dark Matter are remain.

Realizing that something is "wrong" here, we are spent another month "tormenting" this issue. The decision came unexpectedly (on the way to the pharmacy), and it is connected with one of the provisions of the TEMV, which determines that unidirectional electric (and magnetic) vortexes are attracted to each other. We proclaimed this position and used it in analyzing the stability of simples. Now we realized that it also has its second part - different directional electric (and magnetic) vortices are repeled to each other. If we use this second part of the provision, it turns out that the different directional azimuthal electrical vortices of the simples-spirals of the first kind, when they are combined into beams in a transverse manner and then transformed into a simple-spiral of the third kind, will be repelled and assembled in two azimuthal electric vortices , having the opposite direction, on the two opposite edges of the simple-spiral of the third kind. And when folded into a bagel, they will take their place on the side circumferences of the bagel, see Fig. 10_29 (g).

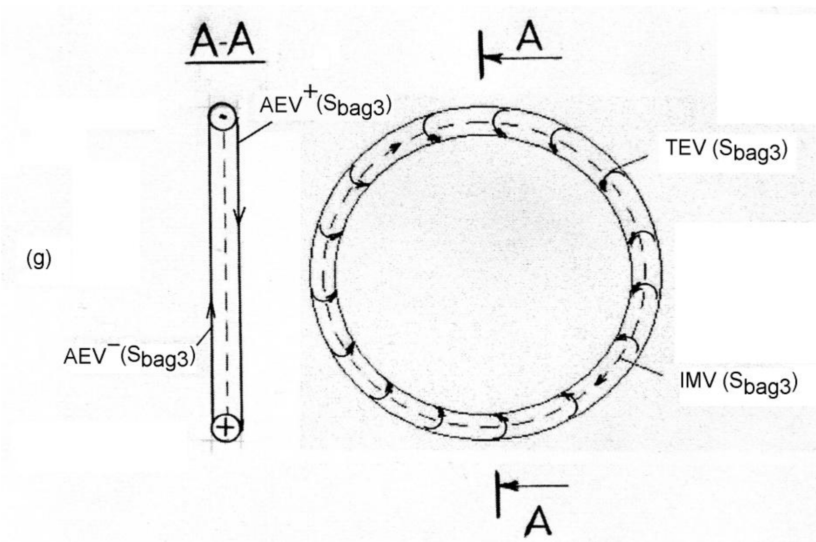


Fig. 10_29. The third version of the S-model of the formation of the Black Hole

We called this option the 3 rd variant of the S_model of AEV_BH formation, which we consider to be correct, since it removes all the criticisms of the previous versions.

Lessons from the constructing three variants of the S_model AEV_BH

From the given chronology and logic of the change S_model AEV_BH formation several "lessons" can be extracted:

1. Having proclaimed the Theory of the Interaction of Electric and Magnetic Vortices (TEMV) as the basis for constructing S_theory, we ourselves do not yet sufficiently "know" the methods of applying the TEMV provisions, which can lead to errors in the construction of individual S_models.

2. Even in the case of "entering" into "deadlock" situations, from which there seems to be no way out, an additional S_analysis of the situation from the positions of the S_theory and TEMV , as a rule, allows to identify the mistakes made and gives the right direction for further "forward movement".

3. It is not necessary to hurry with "discoveries" and constantly conduct multifactor verification of the material before it is published.

Parameters of the minimal BH (ed. ST2 from 12.09.2017)

Let's try to estimate the parameters of the minimum BH formed from the NS.

A typical NS has a mass of 1.35 - 2.1 solar masses and a radius of the order of 12 km [18]. In the BH, NS are transformed starting with a residual mass equal to 2.5 solar masses, i.e. approximately $5 * 10^{30}$ kg. Taking for calculation the maximum NS density equal to 10^{16} g / cm^3, we find that the length of the BH simple-spirale (equal to the diameter of the NS) should be 14.4 km, and the diameter of the BH bagel will be approximately 4.6 km.

The second parameter of the BH bagel is the density of the 3rd type of simples, which is not known to us. But we know the range of evaluation of this density ($3.8 * 10^{19}$ - $5.1 * 10^{93}$ g / cm^3) and that this density can be achieved by transversal, rather than longitudinal, union of first-kind symbols by their gravitational compression.

Accordingly, we can calculate the range of the diameter of the circle that forms the "body" of the BH torus. It is obtained from 54 m to 4.6 E-36 m.

The first value of the range is obviously too high, because it corresponds to the density of BH equal to the density of the simples, and we can safely assume that the BH density is several orders of magnitude higher than the density of the simples. But even for the density of BH equal to the density of simples, we obtained a very "skinny" BH bagel, with a very small diameter of the "body" (torus) BH (54 m), and a very large hole diameter (4.6 km). This circumstance allows us to take a fresh look at the form and "behavior" of the Horizon of BH events, about what we wrote earlier. This circumstance allows us to take a fresh look at the shape and dynamics of the change in the shape of the Horizon of events of BH in a new way.

The horizon of the events of the Black Hole.

The obtained S_model of the black hole has a distributed toroidal structure of rather large diameter of torus and relatively small diameter of the "body" of the BH torus. This result is a characteristic feature of simple-bagel the 3rd type (BH) (see Figure 10_30).

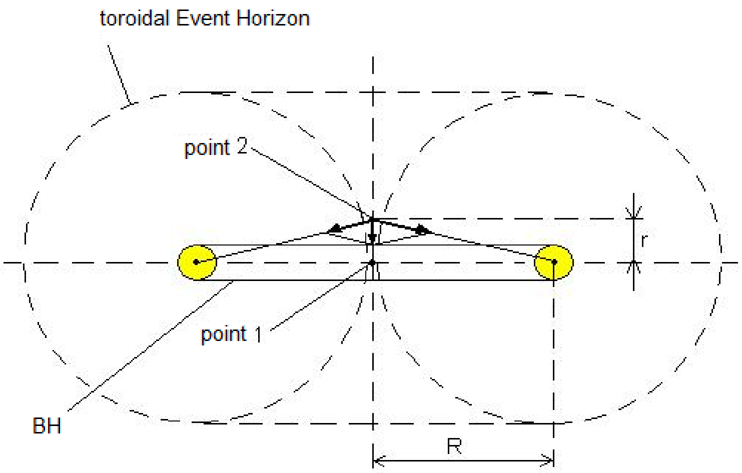


Fig. 10_30. The proportions of the bagel of the "young" Black Hole and its event Horizon by S_theory

The presentedstructure of BH (electromagnetic bagel) and its proportions make it possible to clarify the shape and "behavior" of the Horizon of BH events

We draw your attention to the fact that the attractive forces of a certain point object placed in the central point of the bagel will be balanced. Those. the object will be, as it were, in a state of weightlessness (F1 = 0).

A point object raised above the BH plane by a distance r will be attracted to the BH with a force proportional to:

$F2_{ST}$ ~ (m_{BH} * sin (r / R)) / (R^2 + r^2), where R is the radius of the BH

For the BH point model (singularity), the attraction force of the object at point 2 would be proportional:

F2SM ~ mBH / r2

As we see, for the black hole in the form of an extended bagelST the force of attraction of the objects located on the main axis of the bagelwill be significantly less than for the black hole in the form of a singularity of SM.

This, in turn, means that the event horizon (EH) of such a black hole, under certain ratios of the m_{BH} and R_{BH} parameters, can take the form of a concentric torus with a small hole in its central part (see Fig. 10_30).

Subsequent absorption of a new matter by the Black Hole will lead to an increase in the radius of the HS and sometime there will come a time when the "hole" in the HS closes (see Figure 10_31).

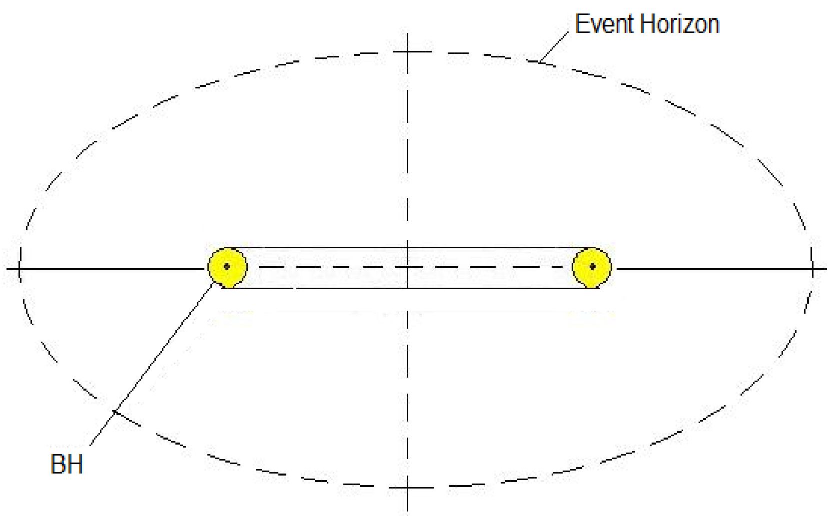


Fig. 10_31. The proportions of the bagel of the "old" Black Hole and its event Horizon according to S_theory

Until this moment of closing the "hole" in the horizon of Black Hole events, purely theoretically (by ST), one can "travel" through the Black Hole. This fact, in our opinion, was fixed by NASA in the summer of 2017 [29], see the insert text below.

Jets of the Black Hole (physical model of appearance, growth and extinction), v2.2 from 31.12.17

The change S_model of the AEB_BH formation pattern leads to a significant correction of the S_model of BH jets formation . Taking into account the dynamics of the change in the shape of the Horizon of BH events, the intensity of the jets also changes.

"Young" Black Hole

In the two azimuthal electric vortices of the black hole, all the azimuthal electric vortices of the original simples forming the NS are united. Their total power turns out to be very large, but they "spin" in opposite directions. And this means that for NS with a total zero charge, the black hole formed in its place will have two azimuthal electric vortices of equal power, and the magnetic vortices generated by them will be different directional and the total magnetic moment of the black hole will be zero.

But, two azimuthal electric vortices located on the opposite sides of the BH bagel will give it a dipole moment, which, if there is an opening in the Horizon of events, plays the role of a natural "accelerator" for charged particles from the surrounding space. Charged particles, flying out from the resulting "accelerator" at high speed, collide with neutral particles in the space surrounding the BH and ionize them. Those in turn are captured by the electric field of the "accelerator" and as a result, the "accelerator" starts to work continuously. The formation of a plasma is accompanied by the release of a large number of photons in different ranges of electromagnetic waves, as a result, this process "from the side" is perceived as the formation of two luminous jets from two sides of the BH bagel, perpendicular to the plane of the BH bagel. In the absence of radiation from the BH itself, this process, being registered much earlier, was called the quasars.

«Old" Black Hole

Over time, the Black Hole absorbs more and more new matter, the BH mass grows, the diameter of the bagel of event horizon increases, and finally there comes a moment when the hole in the Event Horizon overlaps, the Event Horizon acquires a shape similar to spherical, and the acceleration channel of charged particles "closes" - the quasar is quenched. This process is not instantaneous. The horizon of BH events is not an obstacle for the dipole electric field of BH (flagella of virtual photons). Therefore, two "accelerators" of charged particles of reduced power continue to work on the two "sides" of the BH bagel. But the jump in the luminosity of a quasar is inevitable, and it falls sharply.

The "Bursting" Black Hole (BBH)

The quasar's extinction does not stop the process of absorbing matter by the Black Hole. With time, in the collision of galaxies and other cataclysms, Dark matter also gets into BH, bringing with them an excess of negative electric charge. This leads to an excess of the power of the "negative" azimuthal electric vortex over the positive, and as a consequence to the formation of a magnetic moment (vortex) of the black hole, coaxial with the dipole electric moment of the black hole. The power of the dipole and magnetic moments of black holes is constantly increasing. This leads to the fact that the new matter that falls under the event horizon is torn by tidal force into simples with opposite charges, which begin to spin around the BH bagel in the opposite trajectories - a powerful collider forms under the EH_BH. When dialing sufficient power, the "boiler" explodes, tearing a bagel of the BH. It straightens out and begins to "pour" into the surrounding space a powerful magnetic flux - a new process of formation of simples begins.

The reader, of course, understands that this is only a hypothesis (a physical model), especially since we do not give any calculations (mathematical model). But we had to, at least at the level of the physical model of the internal structure and the evolution of the BH, to imagine a possible version of its bursting (explosion). Without this, our idea of stretching virtual photons into a simple-spirales by a powerful magnetic field would not be complete. True, at the moment we have not yet explained how the virtual photons themselves form and where the first BH comes from. These issues we will consider in Chapter 15.

The scale of densities of subnuclear, nuclear and meganuclear objects according to S-theory.

In the course of the presentation of the material in this work, we calculated the density of the main subnuclear (simples), nuclear (nucleons, nuclei) and meganuclear (NS) objects, of which our universe is composed. Below in the table we present these values, calculated by S_theory, and from the reference books for the Standard Model. In addition to the table, we included two lines - the density of black holes and Planck density (maximon).

Density of objects	*by SM (g / cm^3)*	*by ST (g / cm^3)*
nucleus	*2*10 ^{14}*	*2,1*10 ^{14}*
neutron stars	*10 ^{16} [16]*	*(2,5 - 3,2)*10 ^{15}*
nucleons	*5,35*10 ^{15}*	*8,2*10 ^{15}*
simples (S)	-	*3,8*10 ^{19}*
black holes	-	*3,8*10 ^{19} - 5,1*10 ^{93}*
Planck density (maximon)	*5,1*10 ^{93}*	*5,1*10 ^{93}*

Different directories (SM) give slightly different meanings, we hope readers will not be offended if we have somewhere taken outdated data. It should be noted that in SM all objects are considered as having a spherical shape.

The third graph, with the exception of the last line, is calculated by us according to S_theory. We calculated the density of nuclei in Chapter 5, using the example of the unbihexia nucleus, the hypothetical isotope of the island of stability. For the calculation, the shape of the nucleus was taken as the described sphere.

The density of neutron stars was calculated in this chapter for toroidal aggregates, of which NS consists. The volume of toroidal aggregates was approximated by the described cylinder.

We calculated the density of nucleons and simples in Chapter 2, as the ratio of their mass to the volume of the torus of these objects.

Consider the data in the table. The data of the <u>first line</u> is the same, because they were calculated on the basis of the reference masses of the nuclei and the same model of the shape of the nuclei (sphere).

The difference in the data in the <u>third line</u> (nucleons) is explained by different forms of nucleon models in the SM (sphere) and ST (torus). When the outer diameter of the torus and the diameter of the sphere are equal, the volume of the sphere is larger, the nucleon density is correspondingly smaller.

Now back to the <u>second line</u>. At first glance, the data in the third column (by ST) is more correct, they increase from line to line (as it should be).

In the second column (according to SM) the density of NS is indicated more than the density of nucleons, which according to the "ideology" of SM should not be. However, S_theory can explain this "incident". According to ST all nucleons, incl. and neutrons are toroidal aggregates whose outer dimension is formed by bagels of tau-neutrinos, "spread out by a fan". The nucleons them selves "inside" are mostly "empty". This allows the tau-neutrino bagels of one neutron to be insert between the tau-neutrino bagels of another neutron. As a result, the density of the aggregate from such compacted neutrons can be higher than the density of the neutrons themselves.

It should be noted that in the third column (according to ST) the density of NS is calculated without inserting the imputation of neutrons from each other, so it is somewhat smaller than in the second graph.

One can also note another reason why the density of neutron stars is higher than the density of nuclei. According to ST this is due to the fact that the toroidal aggregates of the NS are twisted in the plane (and approximated in our calculation by cylinders), and the nuclei have the form of "bend" and "tangle" inscribed in a sphere having a larger volume.

Fourth line. The density of the simples is higher than the density of nucleons by about four orders of magnitude; this just shows that in nucleons only 1/10000 part of the volume is filled with simples, and 99.99% of volume is "empty".

The question of the density of black holes deserves special attention (fifth line).

Theoretically (according to SM) it is considered that the density of matter in the "most" BH is equal to the Planck density (the sixth line of the table). In this case, the black hole gravitational field forms a Horizon of events (with the Schwarzschild radius), the size of which is often interpreted as the BH size. And as an estimate of the density of black holes, the ratio of the BH mass to the volume of the region of space bounded by the Schwarzschild radius is taken. We found this calculation of the BH density not correct, and did not include the BH density estimation data in our table.

We are interested in the "true" BH density, as the ratio of the BH mass to the volume of its "body" (according to ST it is an electromagnetic torus - or a large simple of the third type). At the moment, we only know the range of densities from $3.8 * 10^{19}$ to $5.1 * 10^{93}$ g / cm3, in which the density of bagels can be found. BH is the difference between the Planck density and the density of the simples.

The difference between the Planck density and the density of simples is 74 orders of magnitude. As we see between them is still a whole "ocean" of a completely unknown state of matter.

At what density does the event horizon start to appear? How is the gap in the density from simples (19 orders) overcome to the Planck density (93 orders), one "jump" or on this "path" is a series of intermediate quantum states? To what level of density do super-large black holes correspond with an experimentally-theoretically determined jets temperature of 40 trillion K^{o} [17]? We can not answer these questions yet, they all require additional research.

Span of the body through a bagel of BH (Insert ST2 from 10.09.2017)

10.02.2017 on all news scientific channels [29] there was information that "NASA was fixed as a huge unknown object are flew out from a black hole". Two space telescopes of the space agency Nuclear Spectroscopic Telescope Array, watched this special black hole when a huge object suddenly flew out of a black hole. NASA experts say that it could be a new planet.

Without giving any assessment to other explanations of this phenomenon, we dare to assume that NASA telescopes observed not flight out, but a span of some cosmic object through the hole in the Horizon of the events of the black hole. The possibility of this event was predicted by us in the first edition of ST (see text above).

S-model of the process of ultrafast quasar extinction (insert ST2 from 02.08.017)

31.07.2017 on many science news portals there was information about the results of research by a number of groups of astrophysicists of the problem of the ultrafast extinction of some quasars [28]. In the results of these studies, the authors argue that the "mysterious" very rapid disappearance of some quasars is due to problems with the "feeding" of their black holes. The S_model of the BH proposed by us makes it possible to propose another explanation of this problem of ultrafast quasar extinction. From this S-model it follows that the constant absorption of a black hole of matter from the surrounding space leads to an increase in the mass of the black hole and, as a consequence, to an increase in the diameters of the torus of the EH and a decrease in its hole .

This leads to the overlapping of the through channel of acceleration of charged particles by the powerful dipole moment of the black hole, the separation of a single powerful jet of black hole into two unrelated, much less powerful jets, and perceived by an outside observer as an accelerated quasar fading.

The rate of the quasar's extinction process depends on many factors, but when certain conditions are combined, extinction can occur very quickly.

Of course, we have given here only the idea (the general scheme of the quasar extinction process in accordance with the BH model), the detailing of which requires additional studies and calculations.

Instrumental data for the formation of quasar jets (insert ST2 from 10/19/2017)

In October 2017, the Astrophysical Journal published an article [35] by a group of astronomers from the Harvard-Smithsonian Astrophysical Center, USA, along with international colleagues (lead author DE Harris, on a detailed study of the quasar jets 4C +19.44, three hundred thousand light-years in length, with the help of observatories operating in different wavelength ranges: X-ray (Chandra space observatory, infrared (Spitzer Space Observatory, optical (Hubble Space Observatory), as well as in the radio range (Very Large Array Observatory).

The article says: 1) "After two decades of studying quasars, scientists today can not say with certainty which physical mechanism is responsible for the x-ray emission of quasars. In more powerful quasars, it is believed that the scattering mechanism dominates. For less powerful jets, the radiation characteristics indicate that X-ray radiation is associated with magnetic field effects. "

2) "Analysis of the results of these observations allowed the authors of the work to come to the conclusion that the intensity of the magnetic field and the particle velocity remain approximately constant along the jet. Scientists do not exclude the possibility of participation in the total process of X-ray generation of a quasar mechanism, including magnetic effects on charged particles of the jet. "

In the results of these studies, it is impossible not to notice their correlation with the S_model of the BH proposed by us.

Risks of BH formation in physical experiments (edition ST2 of 05.09.2017)

It is not ruled out that it is possible to simulate the experimental analogues of the above-described theoretical BH formation process. And this can be done consciously or not consciously in the course of very different experiments. As a result, we can get the "picture" shown in Fig. 10_32, when the black hole with the mass of the planet revolves around its "own" star, and are "sucking" and "devouring" its substance.

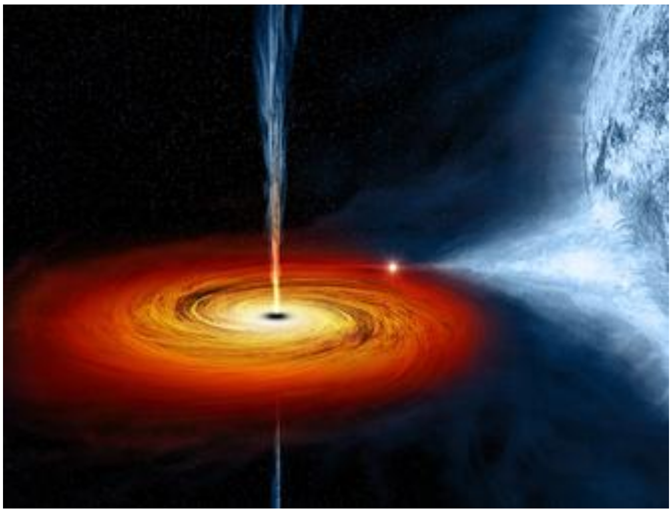


Fig. 10_32. A black hole with a planet's mass "sucks" and "devours" its star

The above "picture" is purely artistic, taken from the source [19]. But who knows, is not this artistic image the result or a harbinger of an "unsuccessful" physical experiment or "act of self-realization" of the next Herostratus?

The proposed S_model of BH formation from the NS, as well as the estimation of the parameters of the minimum BH formed in this way, suggest that in the conditions of the planet, the realization of the BH formation process by natural means is not possible. And artificial? To some extent, this "task" can resemble a story with a thermonuclear fusion (TNS). The natural reactions of the TNS go on the stars by "them selves", and on the planets - to launch an artificial controlled thermonuclear reaction proved to be very difficult, but the uncontrolled thermonuclear explosion "bungled" quite quickly.

Of course, the parameters of the existing physical facilities (LHC, ITER, etc.) are far from the conditions of BH formation in the depths of massive NS, and it is possible that these fears are "empty troubles", but one way or another this possibility should be theoretically modeled and calculated when designing new physical installations and planning physical experiments on them.

There may be other attempts at a special application of S_theory, so it must be recognized that working with electromagnetic high-energy vortices requires the control and supervision by experts of IAEA along with the supervision of atomic research, technology and experiments.

This concludes our consideration of the S_models of the NS and BH.

Nuclear reactions in accelerators (where mu- and tau-neutrinos?)

These reactions will be the last in the series of modern nuclear reactions considered by us. The database of such reactions in conjunction with other nuclear reactions by physicists (nuclear reactions under the influence of cosmic rays, nuclear reactions under the influence of radiation from a nuclear power plant reactor, etc.) is grandiose. It would be very interesting to try to simulate them on the basis of S_theory and compare it with the available experimental data. It would be even more interesting to try to calculate and predict the results of new, only planned nuclear reactions in various new experimental installations. But all this is too big and not feasible for us the amount of work.

We confine ourselves to one question (the result) of all these reactions, which is of great interest to S_theory - where is the tau- and the mu-neutrino?

Yes, all nucleons involved in kinetic nuclear reactions as a "projectile" or as a target, according to S_theory, consist mainly of tau- neutrinos and mu neutrinos. But where are they in the products of these nuclear reactions? When the nucleons are destroyed, there must be a "sea" of tau- neutrinos and mu neutrinos! And where are they?

When studying materials on these reactions, we very rarely encountered in their formulas the symbols denoting tau- and mu-neutrinos. Why?

The answer to this question is given by S_theory itself. In the course of these reactions, the bursting of the tau- and mu-neutrino bagels occurs mainly, they "fall apart" into simples-spirales, which are very "active" due to the presence of a powerful internal magnetic field. Due to this, they very quickly assemble into blocks and, or annihilate, if they have opposite electric charges, or form other new stable particles (for example, electrons), or some short-lived unstable virtual aggregates, which then decay and transform into stable particles or also annihilate. That is why tau-neutrinos and mu-neutrinos in the "whole" form in reactions with accelerators are practically not encountered.

In nuclear reactions, quarks, which forming a single "hoop", which squeezes all the tau- and mu-neutrinos, can also burst in nucleons. But here confinement Confinement enters into operation. If one or two quarks burst, then several mu neutrinos must burst, and from the "fragments" of bursted of mu-neutrinos the new quarks are formed immediately, which "quickly" string on themselves all the remaining tau- and mu-neutrinos and again compress them with a "hoop".

But if all three quarks break in the "hoop" of quarks, then the nucleon can disintegrate, and in this case the tau- and mu-neutrinos can remain intact. But if, as a result of the reaction, simple-spirals with open ends were also formed, then the magnetic vortex of these simples can burn sympathetic bagels of tau and mu neutrinos, destroying them. Or they can gather in some virtual aggregates, which are registered as virtual particles.

Even if the tau- and mu-neutrino manages to escape by unscathed from "tenacious paws" of the nuclear reaction, they must still be detected. And this is a big task for neutral particles.

We see that "hopes" for catching the intact tau- and mu-neutrinos as products of kinetic nuclear reactions, there are very few. For this, special experiment planning and appropriate experimental equipment are needed.

What can not, incidentally, be said about electron-antineutrinos (neutrinos), which are formedin all nuclear reactions in very large quantities, although, due to their insignificant mass and lack of charge , they are very difficult to detect.

This neutrino-neutrino world.

The question of the search for tau- and mu-neutrinos in nuclear reactions is of a fundamental nature. We have become accustomed to the fact that the whole matter consists of atoms, the atoms have a nucleus of nucleons, the nucleons consist of quarks and gluons. And in this "royal dynasty" of particles, according to S_theory, tau- and mu-neutrinos intrudes, trying to take in it the dominant place, corresponding to its weight.

Readers remember that tau- and mu-neutrinos appeared in our S-model of relic neutrons (from which gave rise to all other particles of matter), in accordance with the concept of constructing particles of matter from the "kettlebell" set. They were given the role of the most "heavy weights".

Yes, we could quantize the length of just born simples-spirales and in some other relationship. It was very tempting to do this in accordance with the theory of resonances (in the form of multiple harmonics). But we went the other way - by quantizing the length of the simps under the real (known to physics) elementary particles, according to the principle "do not introduce anything new if you can do with known entities".

Namely, proceeding from this concept and this principle, we selected tau- and mu-neutrinos as heavy and medium "weights". We then noted that our S model for constructing particles of matter based on tau- and mu-neutrinos is a "trial attempt", which must be verified by the particle models obtained in this case and the corresponding calculations.

And now we have completed this "verification".

In accordance with the accepted S_conception and the reference mass-system tied to the masses of tau- and mu-neutrinos, we have developed S_models of the structures and processes of relic neutron formation, of some other basic and elementary particles, of the process of nr_nucleosynthesis of the entire spectrum of isotopes. The basic element of all nuclear processes is the concept of mu-neutrino bursting in all nuclear reactions.

After carrying out an S_analysis of these structures and processes, their regularities were revealed. Based on the revealed regularities, S_CODE was created, which manages the process of nr_nucleosynthesis, and realizes the obtaining of a unique spectrum of isotope masses, which provides a continuous energy process in our Universe (necessary for evolution).

Based on the proposed S_models of relic processes, S_models of the main modern nuclear reactions were developed, their calculation was performed, and the results of the calculation were compared with the experimental data.

From the totality of the results of our "verification", it is possible to draw a CONCLUSION about the fundamental correspondence of the concept of the use of tau- and mu-neutrinos, as the main "constructive" elements of nucleons, for known theoretical and experimental data of nuclear physics.

This concludes the S_modeling and S_analysis of nuclear processes and proceed to S_analysis and S_modeling of other physical processes.

Conclusion of Chapter 10

In this chapter, we again checked the main provisions of the S_theory and the S_model of basic elementary particles and the basic processes of conversion of simples , using S_analyze of modern nuclear reactions.

The results of the analysis make it possible to draw a conclusion about the possibility of using the S_models of particles and processes developed by us for describing and calculating modern nuclear reactions. This conclusion has been tested on a wide range of nuclear reactions such as β_decays, α_decays, n_ and p decays, nuclear fission reactions (NFR), and thermonuclear synthesis reactions (TNS).

The results of the S_analysis of these reactions, taking into account the probabilistic nature of certain S_processes (in particular, the number of bursting mu-neutrinos) completely overlap the known experimental lists of isotopes subject to these reactions.

At the same time, the calculated lists of isotopes according to S_theory are clearly excessive in comparison with the experimental ones, which can be explained by the "interception" of some nuclear reactions by other, or potentially possible, experimental "expansion" of the composition of nuclear reactions in individual isotopes.

During the S_analysis of the nuclear reaction of the β-_decay of the 3H isotope, a fundamental discrepancy of the impossibility of this reaction was revealed in accordance with calculations based on the S_theory based on the reference isotope masses. We made an assumption that the reference mass of the isotope 3H was determined erroneously and we made the correct mass of the isotope 3H is estimated. This assumption requires experimental verification.

On the whole, detailed work on the verification of isotope masses and the energy result of individual nuclear reactions deserves a large separate theoretical and experimental study. This work, in our opinion, is very "noble", deserves all support, and its results are simply "priceless" for confirming or refuting many new theories, including S_theory.

Separately in this chapter S_analysis was conducted and an attempt was made to construct S_models of Neutron stars and their formation processes, as well as S_models of Black holes and the process of their formation during the explosion of large supernovas (with the intermediate formation of Neutron stars in a single process). The results of these hypothetical S-analyzes may be of interest to specialists dealing with NS and BH. The latest astrophysical observations of quasars and potential black holes are in good agreement with the proposed S_model of BH.

In conclusion, a conclusion was made about the acceptability of the concept of using tau- and mu-neutrinos as the main "constructive" elements of the construction of S_models of nucleons.

We believe that S_theory as a whole has successfully passed the verification by comparing the known experimental data and the results of the S_analysis of the nucleosynthesis of isotope nuclei and modern nuclear reactions. From which we can conclude that S_theory provides additional theoretical tools for analyzing and modeling the results of nuclear reactions.

Chapter 11. S_model of the Unified vortex Field Theory. Supplement to the Fundamentals of the Theory of Electromagnetic Vortices (ed. ST2 of 15.11.2017)

In classical physics, field theory is understood as a physical model with an appropriate mathematical apparatus for the mediated force interaction of charged objects (with different kinds of charges). Distinguish, by and large, two types of fields - electromagnetic (the carriers of which are photons) and gravitational (the carriers of which are gravitons). We also know weak interaction and strong interaction, but all of them Standard Model either already "united" or hopes to "unite" with electromagnetic interaction into a single theory.

In our work, we showed that all matter consists of simples. All simples in their physical basis consist of electric and magnetic vortices and possess electric and magnetic moments. S_theory asserts that electromagnetic interaction is the basis of all the processes of birth and evolution of matter.

Under the influence of their electromagnetic properties, simples can be combined into composite particles, which also acquire the corresponding electromagnetic properties and can then interact with each other and merge into isotopes.

All the physical processes from the birth of simples to the formation of "elementary" particles, the formation of the spectrum of isotopes, etc. - the essence of the processes of electromagnetic interaction. Further conglomeration of isotopes (atoms) into molecules, etc. also carried out by electromagnetic interaction.

In classical physics the theory of electromagnetic interaction is elaborated in detail, there are classics, there are scientific schools, there is a powerful, repeatedly tested, mathematical apparatus. The classical physical model of electromagnetic interaction is the charge carriers (electric or magnetic) and photons (carriers of electromagnetic interaction). Everything, further went mathematics, though good, but mathematics.

Why are we so categorical?

But you tell we, please, from the point of view of classical physics, what is the electric charge of an electron or a quark?

Or, where does the magnetic moment of an elementary particle come from?

Or, what is a photon?

One of the authors of this work, being educated by radio engineer (NETI-NETU, 1975), starting to write this work, once asked his friends-schoolmates alma-mater (also radio engineers) - "what is a photon?" , the most meaningful was the answer - "for a photon E = hv". There were more details that the photon is an "elementary particle", a "quantum of the electromagnetic field". "And physically?", I asked again, in response - "silence".

In our opinion, it is only possible to answer this question by introducing electric and magnetic vortices. Below is a physical model of electromagnetic interaction from the point of view of S_theory.

Let's begin with the refinement of the types of electromagnetic interaction.

Electromagnetic interaction in S_theory (ed. ST2 of 15.11.2017)

In S_theory, the physical model of all types of electromagnetic interaction is unified, two charges (electric or magnetic) connected by flagellums (garlands) of microdipole or micromagnet, which are virtual photons or gluons. At the same time, the charges themselves (sources of electromagnetic interaction) are products of the interaction of electric and magnetic vortices, and the microdipole or micromagnetic properties of interaction bearers (of virtual photons and gluons) are also generated by the corresponding magnetic or electric vortices, which, in fact, are these bearers.

The flagellums of the VP or gluons is, to some extent, a physical realization of the lines of force of the electromagnetic fields. By type of "sources" and "carriers" electromagnetic interaction is divided into two types:

1) The classical electromagnetic interaction between electric and magnetic charges, the flagellums between which are built from virtual photons.

2) Strong electromagnetic interaction between the slotted magnets of nucleons, the flagellum between which is constructed from gluons.

Note:
In the Standard Model, we also know the Weak interaction (β_decays), carriers of which are considered vector bosons W^+, W^-, Z^o. In weak interaction, also distinguish between weak currents of these bosons, on the basis of which weak interaction is combined with electromagnetic interaction into a single electroweak interaction. Physics are hope to unite it with strong interaction in the future.
In S_theory, the β_decay reactions do not refer to a special kind of "weak" interaction, but deal with to typical nuclear reactions, the main element of which is the process of mu-neutrino bursting inside nucleons. Burst mu-neutrinos inside the nucleon can occur under external action (K_capture of the electron) or spontaneously (without external action, as a result of internal compression of nucleons by forces of strong interaction and bending of the mu-neutrino bagel is less than the critical radius, for example, β-_decay and β+_decay).
As for the vector bosons W^+, W^-, Z^o detected at β_decays, they are short-lived (virtual) particles and can be considered as intermediate aggregates formed from fragments of simples of the bursting mu-neutrinos, which decay quickly and are transformed into stable particles - products reactions of β_decays.
The reader asks to specify - and where are the electrodynamic electromagnetic processes: generation, radiation and propagation of radio waves, etc., etc.?
Yes, these are also electromagnetic processes, but not of force electromagnetic interaction, but of energy transformation and transfer. And it is terminologically mistakenly considered that the carriers of forces of the electromagnetic interaction and carriers of electromagnetic energy in the form of say, radio waves, are "identical" photons. We consider this to be a fundamental error. The carriers of the force electromagnetic interaction are virtual photons, and the carriers of electromagnetic energy are real photons. Although both types of photons consist of electric and magnetic vortices, their topology is completely different. We will get acquainted with the vortex models of virtual and real photons in Chapter 15, and now we will clarify that in this chapter we consider only the physical model of force electromagnetic interaction by means of virtual photons.

Virtual photons - carriers of electromagnetic interaction

Let us clarify again what real photons are, and why we do not consider them in the framework of the S-model of the Unified vortex field theory.
<u>Real photons</u> to electromagnetic interaction have nothing to do with. They are generated by the ejection of a part of the energy of the internal magnetic vortex (curl) of the simple with a pulse outward from the simple. Next happens convolution the magnetic curl under the action of magnetic forces into a closed magnetic vortex, which in turn generates a closed electric vortex, etc. In this case, the initial impulse gives the direction of propagation of the real photon. The physics of the process of motion of real photons will be considered in Chapter 15.
Real photons form a dynamic electromagnetic field, which serves to carry energy and information, but they are not tools (intermediaries) of force electromagnetic interaction. On the contrary, having momentum and internal energy, and therefore mass, they can act as objects of field interactions, for example, gravitational. Confirmation of which is the deviation of light rays in the gravitational field of massive objects.
<u>Virtual photons.</u>
Virtual photons are of two types. One type is a closed electric vortex with a vector of the magnetic moment (a miniature magnet), the second is a closed magnetic vortex with an electric moment vector (a miniature dipole).
Virtual photons are short-lived massless particles. A white spot, for the time being, is the question of their "birth". Unlike real photons, they are born not from simples, but from "space." This question goes beyond S_theory and requires a separate consideration. In the chapter "Fourth Physics" we will try to clarify this question.
As carriers (intermediaries) of electromagnetic interaction, virtual photons of both kinds "work" the same way. They form chains (flagella, garlands) of miniature magnets, in the case of magnetic interaction, or miniature

dipoles, in the case of electrostatic interaction. Visually, these flagellums can be identified with the lines of force of electric and magnetic fields.
Virtual photons are born in space continuously, in huge quantities and with completely arbitrary orientation. In the absence of sources of charges (electric or magnetic), they are in a chaotic unrelated state throughout their short life. But everything changes, it is only necessary to appear somewhere a source of charge.
When the source of a charge appears, the virtual photons of the corresponding kind surrounding it "stick" to it immediately with one end of a magnetic or electric vector. At the other end of the vector, an appropriate charge appears immediately. A new virtual photon "sticks" to it. Thus, a kind of "shock of hair" is built around the charge from the chains (flagella) of virtual photons.
When two sources of the same type of charge (electric or magnetic) appear at a distance when their "hair" reaches each other, attraction forces arise at the ends of the "hair" (flagellum of virtual photons) if the charges are different polarity or repulsive forces if the charges are unipolar. This is due to the fact that in the activated state (under the influence of charges), the bundles VP acquire elasticity, like springs working on tension or compression.
Separate attention deserves the question - to which places of charges are "stick" the flagellums virtual photons. We will try to answer this question when we disassemble the objects of electromagnetic interaction.

Gluons - carriers of strong electromagnetic interaction (SIF) inside nuclei

About gluons, slit magnets of quarks and S-model of the realization of the forces of strong electromagnetic interaction (the attraction of nucleons to each other) we have already written in detail.
In order not to send you to other sections of the work, we briefly repeat the description of the process of the birth of a gluon and its main difference from a virtual photon.
Recall that gluons are flew from the simple-spirale in the form of separate turns TEV (toroidal electric vortices) in the process of their shortening.
At first glance, a gluon should be very similar (or perhaps even identical) to a virtual photon in the form of an electric vortex with a magnetic moment. After all, the simples-spirales are formed (are stretched into a spiral) from electric vortices of virtual photons under the influence of an external magnetic field. It would be logical to assume that the departed turns of TEV from simples-spirales become again virtual photons.
But let's look more attentively (phenomenologically) to this process.
It all began with stretching the electric vortex of a virtual photon into a spiral. If we take several turns of wire and stretch them into a spiral, the diameter of the turns will decrease. Hence, there is a probability that the diameter of the simples-spirales is less than the diameter of the electric vortices of the original virtual photon.
And, if, being in the simple, the toroidal electric vortex from the inside was "supported" by a powerful magnetic swirl of the simple, but then when it flew off from the simple, the magnetic vortex inside the TEV turns was "blown off" - its density fell sharply, because the volume of space occupied by a magnetic vortex of one toroidal turn increased sharply (the magnetic vortices began to cover the turn of the toroidal electric vortex as a "coat"). And this means that the toroidal turn of the electric vortex could will decrease in diameter.
As a result, if virtual photons of first type are called miniature magnets above, gluons are microminiature micromagnets.
This conclusion that the diameter of gluons is much smaller than the diameter of virtual photons is of decisive importance for explaining the fact that gluons act as intermediaries in the transmission of a strong electromagnetic interaction between slotted magnets of quarks.
The point is that the "channels" for the passage of power interaction bundles in the S_structure of nucleon are strongly "narrowed" in size, and the bundles of virtual photons in them simply can not "get through" (see Figure 2-6).

The reduced gluon diameter is probably also a distance limiter, which is affected by strong electromagnetic interactions. Flagellums from "tiny" gluons retain their strength only up to a certain length, at large sizes they are easily "destroyed".

Sources (objects) of electromagnetic interaction

So, we determined that in S_theory the carriers of electromagnetic interaction are virtual photons for electromagnetic interaction and gluons for strong interaction.
Let us now clarify that (who) are objects of electromagnetic interaction. Let's start with classical physics. Electromagnetic interaction is divided into two types: electrostatic and magnetic.
The sources of electrostatic interaction in classical physics are electric charges (positive and negative), which really exist, but there is no physical model of their origin in classical physics, therefore their existence in the SM is postulated. Electric charges are an inseparable parameter of a number of particles SM and that is characteristic, the total electric charge of the Universe is defined as the sum of electric charges of the given elementary particles in the Universe. In general, the electric charge of the Universe is considered to be zero (the sum of the positive charges of the particles is equal to the sum of the negative charges of the particles), that's just why it happened, the Standard model does not explain.
With sources of magnetic interaction in classical physics, dualism is observed. On the one hand, magnetic moments exist for most elementary particles in SM, although without explaining the model of their formation. But the total magnetic moment of the universe is not equal to the sum of the magnetic moments of the particles. Concepts what is the total magnetic moment of the universe does not exist at all.
The fact is that in nature (in the Universe), in addition to the magnetic moments of particles, there are (periodically appear and disappear) the mass of other sources of magnetic fields (magnetic moments) that have nothing to do with the magnetic moments of elementary particles. These magnetic fields are formed everywhere and permanently, where there is a movement of electric charges.
S_theory has its own "look" at the questions of the origin of electric and magnetic charges. Below are the vortex models of objects and processes of electromagnetic interaction in terms of S_theory. In aggregate, the data of the S_model can be called the Theory of Interaction of Electric and Magnetic Vortices, which to some extent is analogous to the classical Theory of Electrodynamics.
At present, the theory of the interaction of electric and magnetic vortices is very weakly developed (it can be said, is in its infancy). It should be borne in mind that many of the details of this theory, proposed by us in the form of a set of S_models of objects and processes of their electromagnetic interaction, have been developed to a significant degree phenomenologically using known analogues from the classical theory of electrodynamics.

Vortex model of the appearance and location of electrical charges in the simples

Unlike SM, in which the presence of charges for individual elementary particles is postulated, S_theory gives an answer to the question, where do the electric charges come from.
According to S_theory, electric charges are "generated" as a result of the interaction of orthogonal electric vortices. Electric vortexes, connected by a rule of the right gimlet, generate a charge with the sign "-", and electric charges, connected by a rule of the left gimlet, a charge with a "+" sign are generated.
Initially, carriers of electrical charges in the universe (both positive and negative) are simples that have an electrical charge of -1/6 or +1/6 of the charge of an electron for each simple. It is in the simples that when they are born, orthogonal toroidal and azimuthal electric vortices arise that generate an electric charge.
This postulate, perhaps, can be verified experimentally. In this direction, great attention is deserve to the work of F.F. Mende [2]. He succeeded in quite happily discovering the effect of the appearance of electric charges in a superconducting conductor cooled to cryogenic temperatures and filled with Abrikosov vortices, at the external inducing of an electric field (vortex) in that conductor.

We have already noted that the main "bricks" of matter (including Dark Matter) are simples, which are a kind of "perpetual motion machine", in which three types of vortices were originally formed: an internal magnetic vortex (IMV), a toroidal electric vortex TEV) and an azimuthal electric vortex (AEV). The first two vortices mutually generate each other in a closed space without any energy loss, thus providing an unlimited time resource of such an "electrical device". The azimuthal electric vortex turns at the "superconducting surface" of toroidal electric vortices, also without loss, but in the orthogonal direction, as a result of which an electric charge is generated.
In classical electrodynamics there is a "paradox" - electrons moving in two parallel conductors in one direction are attracted, and electrons moving in one direction in space are repelled. Classical electrodynamics gives an explanation for this "paradox", but it is of interest to us from the point of view - how will two "parallel" electric or magnetic vortices behave? After all, there are no moving charges in them.
It seems to us that in the case of vortices, the "attraction" of such vortices will "work", because if they were repulsed, then the simples could not be stable objects. Even at the stage of simples-spirales, repulsive internal magnetic vortices and toroidal electric vortices would lead to the destruction of simples. But attracting the same parallel vortices cause compression of the simples to a certain boundary energy density. All this ultimately leads to the formation of "dense" and stable simple-bagels.
Proceeding from the presented model of charge generation and the behavior of parallel vortices, we can conclude where is the final location of azimuthal electric charges in the simple. All parallel azimuthal electric vortices will be attracted to each other and will be located on the inner circumference of the torus of simple-bagels. This location will be for them an energy pit.
In the case of simple-bagels of hoop of quarks bent into an arc of approximately 120 °, their parallel azimuthal electric vortices will collect together on the inner arc of the simple-spirale.
Thus, the electric charge of the tau-simple-bagels and mu-simple-bagels will be located along the azimuthal electrical vortex of the simples on the inner circumference of their torus.
The electric charge of the electron will also be located along the azimuthal electric vortex of the electron on the inner circumference of the torus consisting of six simples-spirales Se-.
The electric charge of the quarks will be located along the azimuth electric quark vortex on the inner arc of the bent simple-spirale of quarks.
Thus, in fact, the electric charges of individual simples are obtained distributed along their azimuthal electric vortices, i. E. on the inner circumference of the torus of the simple-bagels or on the inner arc of the curved cylinders of the simples-spirales (quarks). It is this region of simples that is the birthplace of the force lines of the electric field (in SM), or the place to which the flagellums of virtual photons-micro dipoles (by ST) are "cling".
In compound "aggregates" consisting of several simples (tau-neutrinos, mu-neutrinos, quarks, electrons, protons, and neurons), electric charges retain their position along the azimuthal electric vortices of each simple, and the total charge of the "aggregate" equals the sum of the charges entering in its composition of simples.

Vortex model of the appearance and location of magnetic moments in the simples

The source of the magnetic moment of the simple is the same azimuthal electric vortex. It is known that every closed electric vortex generates in its center a magnetic moment with a direction determined by the rule of the right gimlet .
But in the center of the azimuthal electric vortex is a hole (!). It is from this hole that magnetic lines emerge, along which flagellum of virtual photons-micromagnets are built. It turns out that the flagellum of virtual photons-micromagnets "cling" to the hole(!). Could this be? No, in a "pure" form, as described, this can not be.
We have to make an assumption about the existence of some other physical substance inside closed vortices, a kind of membrane.
These substances in physics are usually called branes. Branes, for example, are inalienable elements of superstring theory. For their description physicists have created a special mathematical apparatus, according to

which, by the way, two-dimensional branes are nothing but the surface of a torus. Yes, that's how everything "intertwined" in this world.
Another example of the manifestation of field membranes is the process of mutual generation of electric and magnetic vortices in the real photon, when a closed electric vortex generates a closed magnetic vortex that in turn generates a closed electric vortex, etc. (Figure 1-6). Yes, we know this from the school bench, but we somehow do not think about it, how the energy of these vortices is transmitted to each other (?). It is the field membranes inside the vortices that are the transfer link for the energy from the vortex to the vortex. Vortices from this point of view begin to resemble "wheels", but not solid, but, as it were, with thin knitting needles, for which the flagellum of virtual photons-micromagnets can "cling".
We will not go into the physical essence now, and build models of field membranes. We will return to this "problem" when we consider the birth of virtual photons in space in the chapter "Fourth Physics".
Summarizing the results of our phenomenological research - we ascertain that the flagellum-micromagnetics "cling" to the flat field membranes filling holes inside which closed azimuthal electric vortices and having two surfaces (with two sides of the membrane), each of which carries its magnetic charge (one north, the other south).

Formulas for calculating the forces of electromagnetic interaction.

The proposed vortex model of electromagnetic interaction can be "theoretically" tried to digitize. We may to calculate the lengths of the circles of azimuthal electric vortices-the places of attachment of flagellum-carriers of electrostatic interaction, and the area of the described field membranes-the places of attachment of flagellum-carriers of magnetic interaction. Further we may to estimate the transverse dimensions of these flagellums (something similar we have done, estimating the value of the parameter d - the transverse dimension of the simples), and then simulate the algorithm for determining the number of flagellums depending on the magnitude of the charges of objects and the distance between them. The total force of attraction or repulsion of two charges should be proportional to the number of corresponding the flagellum. And in the end we should get well-known formulas for calculating the forces of electromagnetic interaction:
F_{EI} = k1 * q1 * q2 / r 2 - for the interaction of electric charges q1 and q2.
F_{MI} = k2 * µ1 * µ2 / r 2 - for the interaction of carriers of magnetic charges µ1 and µ2.
And we can assume that the formula for the strong interaction of nucleons in the nucleus should look like this:
F_{SIF} = k3 * h1 * h2 / r 2 is the strength of the strong interaction of nucleons in the nucleus of the atom, where h1 and h2 are the number of "holes" from the burst mu-neutrinos in the slit magnets of nucleons 1 and 2.
We will not derive or prove the last formula; now it is enough for us that the strong interaction, according to S_theory, is also of an electromagnetic nature, only with specific "charges" - slotted magnets formed by zigzag closed azimuthal electric vortices. The magnitude of the charge of slotted magnets can be measured in "holes" from bursting mu-neutrinos inside slotted magnets, which is confirmed by our analysis carried out in Chapter 4.

Electromagnetic interaction of neutral bodies. Hysteresis of the forces of attraction and repulsion

After consideration dealt with the electromagnetic interaction of charged objects, we turn to the electromagnetic interaction of neutral objects.
It would seem, what kind of electromagnetic interaction of neutral objects can we talk about (?). However, we know that all objects consist of simples. All simples have electric charges and magnetic moments. Just for neutral objects, the sum of the electric charges and the vector sum of the magnetic moments are zero.
And this means that between the simples of these objects the flagellum VP_microdipoles and VP_micromagnets are all lined up, just half of them work for attraction, and half for repulsion. As a result, the total force of the electromagnetic interaction is zero.

And now let's deepen our analysis a little. Each VP_flagellum "lives" for a limited time (it is virtual, because it consists of virtual photons). Its "task" - during its existence, "pull" the two objects to each other (for the flagellums-attraction), or "push" the two objects apart (for the flagellums-repulsion).
Now we will clarify that the life cycle of all flagellums consists of three stages: to form (1), "pull" / "push" (2), to burst (3).
And now imagine that for some reason, the life cycle of the flagellum-attraction lasts a little longer than for the flagellums-repulsion. This can happen at least at the expense of the third stage, because the flagellum-attraction breaks slightly "longer" (because they are attracted to each other) than the flagellum-repulsions simply-on-just "slip" off each other .
As a result of this assumption, the momentum-attraction created by the two flagellum-attraction will be slightly larger than the repulsion pulse created by the two flagellum-repulsions.
The difference in the duration or magnitude of the pulse-attraction under the pulse-repulsions can be called a kind of hysteresis of the force-attraction and the force-repulsions can of two neutral objects.
As a result, it turns out that for two neutral objects the sum of all the impulse-attraction will be greater than the sum of all the pulse-repulsions. And this means that as a result of its electromagnetic interaction, two neutrally charged objects will be attracted (!).

Gravity in S_theory

All readers, of course, already realized that we have just built a new model of the origin of forces, which are commonly called gravity. Let us formulate this S-model of the origin of gravity.
In S_theory, the gravitational interaction of two material neutral (in the electromagnetic sense) objects is the result of exceeding the forces of electromagnetic attraction over the forces of electromagnetic repulsion between the simples composing these objects. This is explained by a kind of hysteresis - a small excess of the duration of the pulse of attraction above the duration of the pulse of repulsion at formation and bursting of virtual flagellums from virtual photons transmitting the electromagnetic interaction between the simples.
Consequences from the S-model of gravitation:
1. Gravitons, as real physical objects, no.
2. Gravitational field, as a separate type of field, no.
3. Gravitational waves, as a perturbation of the gravitational field, no.
<u>However:</u>
1. Under the notion of gravitons, one can interpret virtual objects identified with the difference between the pulse-attraction and the pulse-repulsion of the unipolar and unipolar VP flagellums.
2. In addition, the constant process of formation, interaction and tearing of a large number of virtual VP flagellums can be interpreted as an oscillatory process - (flagella arise, interact and burst - arise, interact and burst - etc). As in any oscillatory process, with a sudden change in the mass of sources in the number of flagellums VP, "throb" can occur. The data of "throb" can be considered as a manifestation of gravitational waves.
3. Well, if there are gravitons (even virtual ones), as well as gravitational waves (also to some extent virtual ones), then it is possible to "introduce" the notion of a gravitational field (quasi virtual). It can be calculated, quantized, constructed wave function, only this field from this does not become a real physical field. It will be a virtual manifestation of the "work" of the electromagnetic field, consisting of their flagellums VP.

Gravitation of real photons (insert as of 12.11.2017)

The main question is, where the RP has "ports" for joining the flagellums of the VP. With flagellums of the VP-micromagnets is simpler, - electric RP-vortices generate a magnetic vector inside themselves, i.e. the internal space of the electric vortex of the RP is a magnetic brane. To her, and clinging flagellums VP-micromagnetics.

By analogy, the magnetic vortices of the RP generate inside themselves a dipole electric brane, to which the flagellum VP-microdipoles also cling. It turns out that the flagellums VP-microdipoles can cling not only to the places of electric charge generation (azimuthal electric vortices, but also to branes of magnetic vortices.

Gravity of Black Holes (insert as of 11/12/2017)

As you know, virtual photons do not have mass. This allows them to build flagellums and join the corresponding "ports" of the Black Holes, without fear of being drawn into the BH. Such an S-model of gravity allows to explain the gravitational interaction of black holes. The only question is - it is necessary to clarify where the "ports" are for connecting the flagellums VP from BH and how their number is determined.
The change in the S_model of formation of the azimuthal electric vortexes of the black hole, proposed by us in the release of v.2.2 S_theory (in comparison with the 1st edition of ST), restores the efficiency of our concept of gravity as applied to the Black Holes. In v.2.2 S_ of the BH model, all the azimuthal electrical vortices of the original simples are storing, both "positive" and "negative". They are repelled from each other and merge into two powerful azimuth electric vortices on two opposite sides of the BH bagel. As a result, all the "ports" for attaching the flagellums VP are retained, the impulses of attraction and repulsion of which transfer the gravitational interaction of BH with other bodies that have fallen into the region of this interaction.

S_model of the Casimir effect

The S-model of gravity (attraction of neutral bodies) described by us, as the predominance of pulses from virtual flagellums of attraction above pulses from virtual repulsive flagellum, allows made a new explanation for the known Casimir effect, consisting in the emergence of an additional attractive force of two parallel neutral plates placed in vacuum at close range to each other.
The fact is that the known formula for the gravitational attraction of two neutral bodies is valid only for ideal bodies, the mass of which is "assembled" in a point that is the center of mass of these bodies. But real bodies have some extension.
Of course, one can solve the problem of attraction of extended bodies by the method of integrating the gravitational attraction of all the "points" of these bodies. But the result will be about the same as for ideal bodies. It should be noted that in this case the gravitons, that are still "not open" but having a theoretical representation, like certain elementary particles with zero mass and zero size, act as carriers of gravitational interaction and are having infinite penetrating power.
When using the S_model of gravitational attraction of extended neutral bodies, the picture changes somewhat. The fact is that virtual photons, from which the flagellums of attraction and repulsion are formed, also have some small but finite size, and hence their penetrating power is not infinite.
And this means that in extended bodies, some of the charges can screen each other, as a result of which not all charges will participate in the formation of virtual flagellums of attraction and repulsion. This fact is not taken into account in the well-known formula of the gravitational attraction of two bodies.
We draw your attention to the fact that when these bodies are flattened into thin plates and parallel to each other, all points of the bodies become "open" to each other. As a result, the maximum number of virtual flagellums of attraction and repulsion is formed between the bodies. And since the pulses from the flagellum of attraction are somewhat larger than the pulses from the repulsive flagellums, a certain resulting additional force of gravitational attraction of these plates arises. It turns out that the force of gravitational attraction of these bodies in the flattened state will be greater than the force of gravitational attraction of these bodies, squeezed into "balls", in which some of the charges (or rather their carriers) screen each other.
The increased number of flagellums between the flattened parallel bodies explains the appearance of an "additional" force of attraction between them (the Casimir effect).
Probably, this effect can manifest itself in some other variants of gravitational interaction of bodies, for example, connected with their elliptical or some other form.

Gravitation of Neutron stars (insert as of 11/12/2017)

After analyzing the S_model of the Casimir effect, the question of the gravitation of neutron stars automatically arises. That's where the nucleons are packed as tightly as possible compared to the matter of ordinary stars. And this means that not all flagellums of the VP, having a finite size, will be able to "get out" of the Neutron star and take part in its gravitational interaction. And this means that the gravitational mass of the NS, determined precisely by the interaction of the flagellums VP with other bodies, will be somewhat less than the inertial mass of the NS, determined by the energy of the internal magnetic vortices of the simples, and equal to the gravitational mass of the "free" simples.

S_model of Gravitational Waves (insert as of 10/09/2017)

The awarding of the Nobel Prize in Physics in 2017 for the discovery (detection) of Gravitational Waves certainly could not pass by our attention. Let us clarify once again the S-model of the formation of gravitational waves and consider possible variants of their detection.

To begin with, we clarify the concepts of inertial and gravitational masses from the point of view of S_theory. The inertial mass of the body is the mass generated by the internal closed magnetic vortices of all the simples from which the body consists. In magnitude, it is proportional to the total length of all the simples of the body. The gravitational mass of the body is generated by the force of attraction of the bodies as a result of the hysteresis of the duration of the attraction pulses and the repulsive impulses of the electromagnetic interaction of the flagellums of virtual photons (VP) attached to these bodies. The magnitude of the gravitational mass is determined by the number of interactions of the flagellums of VP, the number of which is proportional to the total length of the azimuthal electrical vortices of the two-body simples - the attachment sites of the flagellums VP_microdipoles, and the area of the branes (holes in the bagel) - the places of attachment of the flagellums VP_mikromagnets. The effect of (Casimir) shielding of the flagellums channels of the VP by clots of simples (central regions in the atomic nuclei) exerts some influence on the magnitude of the gravitational mass (gravitational interaction).

S_model Gravitational waves is an amplitude modulation of the magnitude of the electromagnetic interaction of flagellums VP with a sudden change in the total mass of two bodies (the total number of their simples). It is possible to simulate several examples of such a discontinuous change in the mass of bodies.

<u>Example 1:</u> Merging of two Black Holes (BH1 and BH2). It is believed that this particular option was registered on the LIGO and VIRGO detectors, which resulted in the awarding of the Nobel Prize. A significant part of the mass of BH1 and BH2, when merged, instantly is carried away in the form of radiation. There is an abrupt decrease in the total mass, as a result, the number of flagellumstes of the VP that transfer gravitational interaction to the third bodies decreases and in the gravitational interaction with them a jump occurs (a gravitational wave will be fixed).

<u>Example 2:</u> Two BH or NS (neutron stars) rotate relative to one another and mutually are shield some of the flagellums VP "going" to the third bodies located in the plane of rotation BH (NS). The gravitational interaction detectors located on these bodies should observe strictly periodic amplitude modulation of the gravitational interaction (gravitational waves).

Electromagnetic models of gravity of other authors

Pursuing the calculations of the magnitude of the charge of the universe (see the chapter "Dark matter"), unexpectedly for ourselves, we stumbled in the Internet on steel V.M. Petrov "Gravitation as a manifestation of electricity", confirming our conclusions about the electromagnetic nature of gravity [22].

In this the article V.M. Petrov are expresses a brilliant hypothesis explaining the origin of the forces of gravitation between neutral material bodies through a slight excess of the forces of electric attraction above the forces of electric repulsion.

V.M. Petrov gives in his article a number of possible explanations of his hypothesis. We will not go into their discussion, let us say only that the our idea of exceeding the forces of electromagnetic attraction above the forces of electromagnetic repulsion of two neutral bodies due to a kind of hysteresis (excess) of the pulse duration from the action of electromagnetic flagellum-attraction above the pulse duration from the action of electromagnetic flagellums-repulsion , is, in our opinion, a good physical model, explaining the hypothesis of V.M. Petrova.
In addition, it should be noted that, according to our S-model, both electric (dipole) and magnetic flagellums of the VP are involved in the formation of gravitational forces. Thus, gravitational forces are a kind of "recoil" of the total electromagnetic interaction between bodies.
In an article V.M. Petrova has many other interesting moments, one of them is an explanation of how gravitational forces, having an electrical nature, pass inside closed electrical conducting screens through which electric fields should not pass. V.M. Petrov explains this by secondary electric charge generation on the screen of , which generate a secondary electric field inside the screen, which has the opposite direction with the primary electric field passing inside the screen. As a result, the primary and secondary electric fields inside the screen are compensated, and no devices are not recorded their. At the same time, if the material body is inside the screen, under the influence of the penetrated primary electric field, it begins to experience a gravitational interaction.
In our opinion, this explanation is controversial.
The thing is that V.M. Petrov operates with a "traditional" electromagnetic field consisting of real photons, and uses the appropriate mathematical apparatus. Get in this case the desired result is not possible. According to S_theory, the electromagnetic interaction is transmitted via flagellums of virtual photons. The cross section of flagellums from virtual photons has a size commensurate (and perhaps equal) to the size of electronic neutrinos, which provides them with a high penetrating power. In addition, VP flagellums themselves do not have mass (in contrast to real photons). This circumstance allows them to serve as conductors of gravitational forces from the Black Holes inside the event horizon and beyond the horizon of events, without "being afraid" of being captured and collapsed by the "gravitational field" of BH, which can not be said about real photons.
PS (additional thoughts on the article by VM Petrov): Remember the mathematical models of Japanese physicists who established the grouping of nucleons in the oxygen isotope along 4 pcs. (ST_"beads"), experiments F.F. Mende, who discovered the occurrence of electric charges in the interaction of interacting electric vortices (ST_charge = orthogonal electric vortices), and the stated hypothesis of VM Petrov about the electrical nature of the forces of gravitation (ST_hysteresis of force-attraction and forces-repulsion of VP flagellums). After that we have a "vague feeling" that if we will study S_theory for another couple of years, then there will be nothing for us to publish.
However, in order to evaluate the correctness of the S_theory proposed by us (rather simple, in the part of the model for the creation of simple), we set ourselves the task of verifying all the consequences that follow from it. We have already passed a considerable part of the "way", we continue the "forward" movement (but from the Cosmological point of view "backward").

Relativism in S_theory (S_Model)

Let us recall once again the thesis of V. Rubakov: "The new physics must explain everything that is known and something else that is not known."
Relativistic effects (in particular, the growth of the mass of an object with increasing its velocity) are considered reliably verified experimental data of modern physics. Hence S_theory should explain them.
Let's try to build a physical S-model of relativistic effects on the example of the growth of the mass of an object with the growth of its velocity.
In accordance with ST_model of gravitation with the growth of the speed of the object, the number of "transactions" of flagellums of VP of the object with flagellums of VP of other objects in the surrounding space or with the global network of virtual photons of space increases . Accordingly, the total delta of the difference of the impulses-attraction and repulsion-impulses acting on the given object increases, which is just what is perceived as

the growth of the mass of the object. This effect is also called the growth of the inertial mass of the object. According to S_theory, the "number" of internal magnetic vortices that determine the rest mass of the body (and this is the inertial mass of the body) does not change with an increase in its velocity, so it is more correct to speak of an increase in the gravitational mass of the body (determined by the interaction of the flagellums of VP attached to it, with environment). This interpretation also explains the effect of growth of the gravitational mass of the body near objects with a large mass. Further, speaking of relativistic mass growth, we will use the term gravitational mass.

The considered S-model of relativistic effects (RE) gives additional arguments in favor of the existence of a global network of flagellums VP (GN_VF). The presence of GN_VF allows the RE to manifest itself when a single object moves in an absolutely "empty" space. In this case, flagellums VP of the object interact ("transactions") with the VP_ inputs of the GN_VF. This, indirectly, indicates that GN_VF is stationary, i.e. the VPs that are born in space and form the GN_VF are "tied" to it.

At first glance, the growth of the gravitational mass of objects is proportional to the speed of objects. In fact, as the speed of the object increases, the amount of space that the object overcomes in a unit of time grows, correspondingly the number of VP_inputs of the GN_VF, with which the flagellums VP of the object are interacts, as a result, the gravitational mass of the object grows.

However, according to the Theory of Relativity, the growth of the gravitational mass of an object with an increase in its speed goes linearly, only in the initial velocity range, and when the speed begins to be commensurable with the speed of light, the growth of the inertial mass becomes exponential.

S_model RE gives an explanation of this effect. As the speed of the object approaches the speed of light, the repulsive flagellums VP does not have time to interact with each other (they "slide" too fast each other and do not have time to impart an impulse-repulsion to the object). While the flagellums-attraction clings to each other and their work is carried out. As a result, the hysteresis between impulse-attraction and impulse-repulsion increases, which leads to a faster growth of the object's gravitational mass.

The described S_model RE can be associated with a certain algorithm, derive formulas and even calculate specific versions of the motion of objects and compare its results with theoretical data and experimental results of testing the theory of relativity.

But, out of great respect for A. Einstein, we do not wade this, especially since the result should be similar to the relativistic formulas of the theory of relativity of Einstein. Let, for now, everything remains as it is.

The verification of our S-model of action and manifestation of relativistic effects can only be done after evaluating the validity of S-theory on simpler examples (experiments).

Two models of the global electromagnetic field (the global network of flagellums VP)

When considering the S-gravity model, we used a new term - a global electromagnetic field consisting of flagellums of virtual-photons. What it is? There are two options for implementing the global electromagnetic field:

The first option is an infinite set of "thin" and "thick" braids from the flagellums VP, piercing the space from the object to the object. This raises a whole series of new and interesting questions, such as: what will happen when crossing or imposition the flagellums VP between the Sun and the planets (a parade of planets), between several neighboring stars in the galaxy, or super-flagellums VP between neighboring galaxies? In fact, all these questions boil down to one thing: do the flagellums VP interact with each other?

Astronomers are actively engaged in studying the topology of the starry sky and, in particular, the parade of the planets of the solar system. The changes in the orbits of the planets fixed in this case completely fit into the theory of the gravitational interaction of the planets themselves. The only additional consequence of the parade of the planets, according to the results of a study by Italian scientists, is the periodic climate change on Earth, associated with a decrease in the ellipticity of the orbits during the parade of planets [20].

Perhaps, the interaction of the flagellums VP manifests itself only on super-bundles between galaxies or clusters of galaxies.
The second option is another. If we assume that virtual photons are born in space evenly, then they can form a regular structure ("network"), which is activated when space-borne objects appear. The process of transmitting electromagnetic interaction via the "network" is started. This structure (the "network") in a certain limited area of space occupied by some material object can have a fairly large number of "inputs" for "connecting" flagellums VP "network" to the simples - the bearer of the charges of this object. Such a "network", of course, must provide the necessary bandwidth to transfer all the "transactions" of electromagnetic interaction of a given material object with other objects.
This hypothesis also has analogues in a number of new physics, for example, the theory of the string networks of Xiaoganom Van, Michael Levin [21]. Approaches to the formalization of this hypothesis, in our view, should be sought at the junction of the S_theory of the field and the Theory of Space (Fourth Physics).
In general, the field theory requires a very large amount of additional theoretical and experimental research.

Supplement to the Fundamentals of the Theory of Electromagnetic Vortices (dated November 17, 2017)

paragraph 16: There are two types of photons: virtual and real. The field of "application" of virtual and real photons is completely different. Virtual photons are carriers of electromagnetic interaction. Real photons are carriers of electromagnetic energy.
In general, the entire S_concept of the Unified vortex field theory can be considered an integral part of the Theory of the interaction of electromagnetic vortices.

Correlation of the Unified vortex field theory with classical and quantum electrodynamics (insert as of 11/18/2017)

The reduced model of the unified vortex field theory, in principle, allows, knowing the parameters of all the vortices, to calculate the total number of flagellums VP, which will reflect the intensity of the electric and magnetic components of the static electromagnetic field (what classical electrodynamics is doing). Given the virtual nature of flagellums VP, one can calculate the probability of "appearance" of flagellums VP at a particular point in space (what is involved in quantum electrodynamics). Hardly, however, some developer, say, of a magnetron will come to mind to calculating all the fields of the magnetron at the level of their constituent vortices, to understand how this electron will be excited and to "reset" their excitation, throwing out excess energy in the form of real photons. The result will certainly be the same as in both electrodynamics.
However, the vortex model of the field allows deeper, at the physical level, to understand the real processes taking place in various electromagnetic processes.
Thus, with respect to photons, one can speak not about dualism, but about the three manifestations of photons in the form of classical electrodynamics, quantum electrodynamics, and vortex electrodynamics. In this case, vortex electrodynamics is the basis for the first two.

Conclusion of chapter 11

The main distinguishing feature of the S_theory of the field is the S_model of the transmission of electromagnetic interactions through the flagellum of virtual photons and gluons.
In accordance with this model, we simulated the location of electric and magnetic charges on the simples.
A detailed analysis of the processes of formation, interaction and bursting of flagellums VP allows us to conclude that there is a hysteresis of the duration (impulses) of attraction and repulsion of the different polar and unipolar flagellums of the VP.

The application of this model to the analysis of the electromagnetic interaction of material bodies consisting of simples but having neutral total electric and magnetic charges gives an explanation of the origin of the gravitational forces of attraction of these bodies as a result of the hysteresis of the duration of the impulse of attraction and repulsion of the electromagnetic interaction of the constituent charges.
This model of gravity allows give a somewhat new explanation of the known Casimir effect and suggests an S-model that gives a physical interpretation of the origin of relativistic effects. The S-gravity model does not deny the existence of gravitational waves, as a result of the "beating" of the forces of electromagnetic interaction of neutral bodies with a sudden change in the conditions for the formation of flagellums VP (change in the mass of bodies, shielding each other's bodies during rotation, etc.). The proposed electromagnetic model of gravity "echoes" with some other similar theories.
The theory of electromagnetic vortices is supplemented by the approval about the existence of two types of photons: virtual and real. The field of "application" of virtual and real photons is completely different. Virtual photons are carriers of electromagnetic interaction. Real photons are carriers of electromagnetic energy.

Chapter 12. Asymmetry of the formation of simples. Dark matter. Electric charge of dark matter. Dark energy.

Formulation of the problem

We have analyzed almost all Cosmological stages of nucleation and formation of matter in the Universe. If you group the related stages as much as possible, then you get only four eras, this is:

1. The era of the birth of simples is the stretching of the VP by a powerful magnetic field into spirals, quantization of their lengths (dumping of TEV-gluon turns), the formation of simple-bagels and simples-spirales.
2. The era of the formation of relic neutrons from simples - the grouping of simples into blocks, the formation of tau neutrinos, mu neutrinos, quarks (blocks of simples-spirales), the union of groups and blocks of simples into single aggregates - relic neutrons.
3. The era of nucleosynthesis - the formation of the spectrum of isotope nuclei as a result of the decay of some relict neutrons (into protons and electrons) and the process of successive addition of relic neutrons with their transformation into "modern" protons and neutrons.
4. "Modern" era - the gravitational structuring of matter, the formation of galaxies, stars, planets, the launch of modern nuclear reactions on stars, and on the planets of the "conveyor" of the evolution of matter.

But, it turns out, in the second era there was an additional event - the separation of matter, tk. not all simples "turned" into "noble" substance (relic neutrons). Most of the simples in the formation of matter was not in demand and formed some other aggregates, constituting the so-called "ignoble" Dark matter.
This is explained simply - when relic neutrons were formed, only a certain set of simples was used in a strictly defined ratio. Namely, for the formation of one relic neutron, 254 simples were used, including by types:
nr = 60Sτ- + 60Sτ+ + 61Sμ- + 61Sμ+ + 4Sd- + 4Su+
But simples at the stage of their birth and quantization of lengths were formedin a completely another relationship. The task before us is:
A) Determine the number of simples of different species at birth and after quantizing their lengths.
B) Calculate the ratio of simples by species, quantity and mass used to form matter and remaining in Dark Matter.
C) Knowing the composition of the simples remaining in the Dark Matter, try to simulate the possible composition of the S_aggregates, of which Dark Matter consists.

Asymmetry of the number of negative and positive symbols

To determine the ratio of the number of simples of different species at their birth, we will analyze this process once more, in details.
Above, we have repeatedly written that simples were formed from virtual photons (in the version of micromagnets) under the influence of a short-time powerful magnetic field (SPMF), which was sprawled the VP into spirals.
Initially, VPs are formed in space in huge quantities with completely arbitrary orientation of their magnetic moments (H_{VF}), uniformly distributed from 0^o to 360^o solid angle (sphere).
The SPMF has a very definite orientation of its magnetic moment (H_{SPMF}). We take this direction as zero (0o solid angle), see Fig. 12_1.

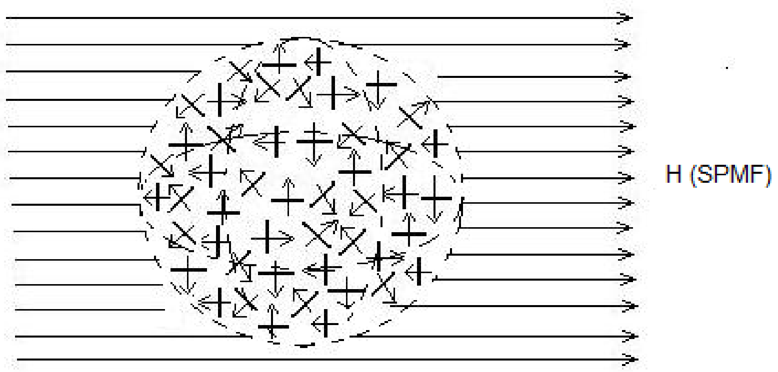


Fig. 12_1. Orientation of VP in space with respect to SPMF

In Chapter 2 we described in detail the S_model of the stretch of VP stretch to the simples-spirales. Need to say that in addition to the magnetic moments of the H_{SPMF} and H_{VF}, the so-called the barrier force of stretching the turns of VP to spirale also affects on the process of the stretching of the VP. (we took this analogy from the theory of stretching of springs).

Then for VP, whose magnetic moments have an orientation (angle α) from -90 ° to + 90 ° of the solid angle, the projections of the magnetic moments of the H_{VF} on the α axis will coincide with the SPMF . From such VP, simples will be formed having a negative electric charge, and the total magnetic moment inside these simples at the time of their formation will be equal to:

$$H_{S-} = H_{SPMF} * \cos(\alpha) + H_{VF} \qquad (1)$$

Remembering the need to overcome the barrier force to begin stretching the "spring" of the electric vortex of the VP, the length of the helix simples S (-) before quantization (shortening the length) will be proportional:

$$L_{S-} \sim (H_{SPMF} * \cos\alpha - H_{BAR}) + H_{VF} \qquad (2)$$

H_{BAR} here is indicated some minimum magnetic field strength, at which the "springs" of electric VP vortices begin to prolong. For calculations, we took $H_{BAR} = H_{VF}$, which means that the H_{VF} itself can not stretch the windings of the VP into a spiral. But when the equality $H_{SPMF} * \cos\alpha = H_{BAR}$ is reached, the negative simples under the action of the H_{VF} "jerk" are stretched to some $L_{S-(min)}$, immediately falling in the range of the lengths of the simples-spirales more between L_{Sd} and L_{Se}.

The maximum length of the simples-spirales S(-) will be $L_{S-(max)}$ for the angle $\alpha = 0^o$.

And in the VP, whose magnetic moments have an orientation (angle α) from + 90 ° to + 270 ° of the solid angle, the projections of these magnetic moments of the HVF on the α axis will be the opposite of the SPMF . From such VP will be formed simples that have a positive electric charge, and the total magnetic moment within these simples at the time of their formation, will be equal to:

$$H_{S+} = H_{SPMF} * \cos(\alpha) - H_{VF} \qquad (3)$$

The length of the simples-spirales S(+) before quantization (shortening the length), taking into account the overcoming of the barrier force of the VP stretching, will be proportional:

$$L_{S+} \sim (H_{SPMF} * \cos\alpha - H_{BAR}) - H_{VF} \qquad (4)$$

The maximum length of the simples-spirales S(+) will be $L_{S+(max)}$ for the angle α = + 180 °. The minimum length of the simples-spirales S(+) will be zero for the angles

$$\alpha = (90^o + \alpha_{S+\,min}) \text{ and the angle } \alpha = (270^o - \alpha_{S+\,min}).$$

From equations (2) and (4) it also follows that:

$$H_{VF} \sim (L_{S-(max)} - L_{S+(max)}) / 2 \qquad (5)$$

$$(L_{S-(max)} - L_{S+(max)}) \sim 2H_{VF} \qquad (6)$$

In Fig. 12_2 is a diagram of the lengths of negative (2) and positive (4) simples, depending on the angles α in the orthogonal coordinate system. The values of the zero-length cutoff angles and the degree of shortening of the positive symbols on the diagram are given conditionally. Calculating these values is our task.

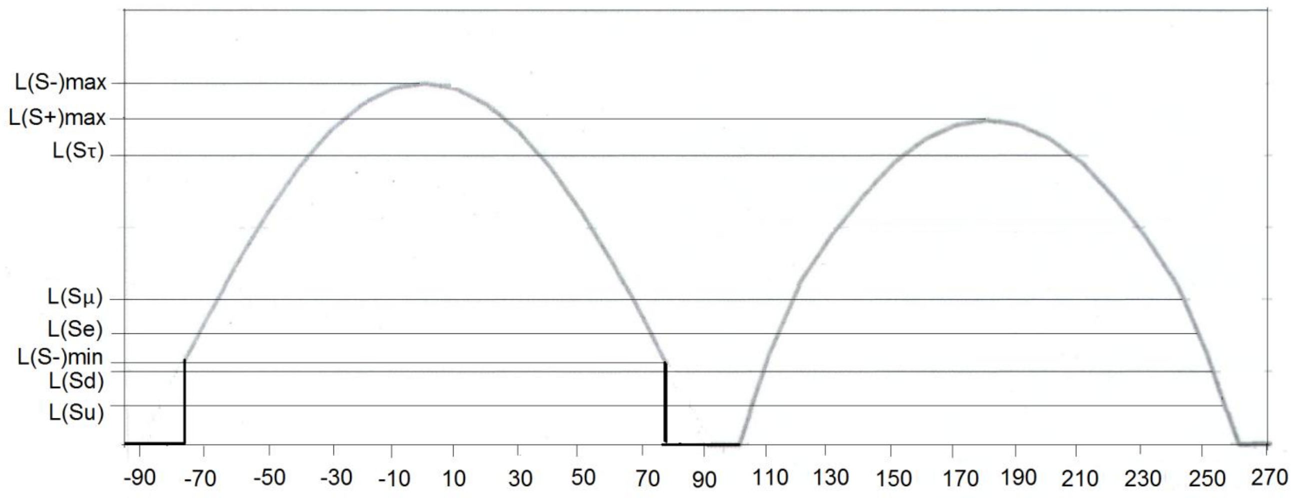


Fig. 12_2. Diagram of the lengths of negative and positive simples in the orthogonal coordinate system (the values are conditional).

For further reasoning, we take a certain bounded region of space in the form of a sphere in which, for example, 100 relic neutrons are formed.

The set of all points of the surface of a given sphere is a set of orientations of the magnetic moment vectors of the VP (MM_VF) in the given region. By definition, the distribution of the orientations of the MM-VF vectors over the surface of the sphere is uniform.

To each type of simples formed in a given area corresponds to its spherical belt of the surface of the sphere, corresponding to a certain range of the change in the solid angle α, in which simples of a given type are formed (corresponding to the stretch range of the lengths of the simples of this type). The distance from the equator of the sphere to the base of this spherical belt corresponds to the length of the given symbols after the shortening (length quantization).

Accordingly, the number of simples of this type will be proportional to the area of the given ball zone, enclosed in the interval from the lower base of the ball belt (equal to the length of the given kind of simples after quantization) to the upper boundary of the ball belt (equal to the length of the simples of the next kind in order of length), see Fig. 12_3.

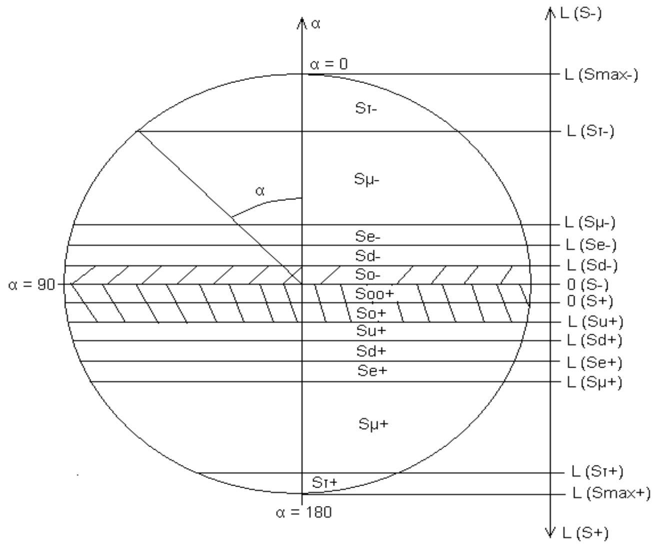


Fig. 12_3. The division of the test sphere of the space in which 100 relic neutrons are formed, into spherical belts corresponding to nine kinds of real simples (Su+, Sd+, Se+, Sμ+, Sτ+, Sd-, Se-, Sμ-, Sτ-) and two belts "simples" of zero length (So+, So-)

Let us recall the formula for calculating the area of the spherical belt:

$S_{sphere\ belt} = 2\pi r * h$, where h is the height of the sphere belt

It turns out that the number of simples of each kind is proportional to h (the height of the sphere belt), i.e. intervals between the lengths of the simple_spirales, namely:

The lengths of the simples:

L (Su) = 11,162153 (d)
L (Sd) = 21.229439 (d)
L (Se) = 25.065277 (d)
L (Sμ) = 27.34564 (d)
L (Sτ) = 2275.93 (d)

Length intervals and the number of real simples:

Number (Su+) ~ ΔL (Su+) = L (Sd+) - L (Su+) = 10,067,286 (d)
Number (Sd+) ~ ΔL (Sd+) = L (Se+) - L (Sd+) = 3.835838 (d)
Number (Se+) ~ ΔL (Se+) = L (Sμ+) - L (Se+) = 2,280,363 (d)
Number (Sμ+) ~ ΔL (Sμ+) = L (Sτ+) - L (Sμ+) = 2248.5848 (d)
Number (Sτ+) ~ ΔL (Sτ) = L (S+) max - L (Sτ+)
Number (Sd-) ~ ΔL (Sd-) = L (Se-) - L (H_{VF})
Number (Se-) ~ ΔL (Se-) = L (Sμ-) - L (Se-) = 2.280363 (d)
Number (Sμ-) ~ ΔL (Sμ-) = L (Sτ-) - L (Sμ-) = 2248.5848 (d)
Number (Sτ-) ~ ΔL (Sτ-) = L (S-) max - L (Sτ-)

Here, L (H_{VF}) denotes the initial length of the jump like stretching of the negative simples-spirales by the internal magnetic field of the VP at the moment of compensation by the external magnetic field of the barrier force for the beginning of the stretching of the "spring" of the electric vortex of the VP ($H_{SPMF} * \cos\alpha = H_{BAR}$). In Ch. 2, we noted that L (H_{VF}) lies in the interval from L (Sd-) to L (Se-), i.e. ΔL (Sd-) is in the range from 0 to 3.8358 (d).

Further, we note that the distribution density of the number of simples of all kinds over the intervals of the lengths of the simples is constant:

$$\rho = \text{Number (S)} / \Delta L(S) = \text{Number (Su+)} / \Delta L \text{ (Su+)} = \text{etc.} \sim S \text{ (sphere belt)} / h = 2\pi r = \text{const}$$

there S (sphere belt) - area of sphere belt

This conclusion allows us to modify the diagram, giving it actually to the dependence of the number of simples of each kind from interval of symbol lengths, see Fig. 12_4.

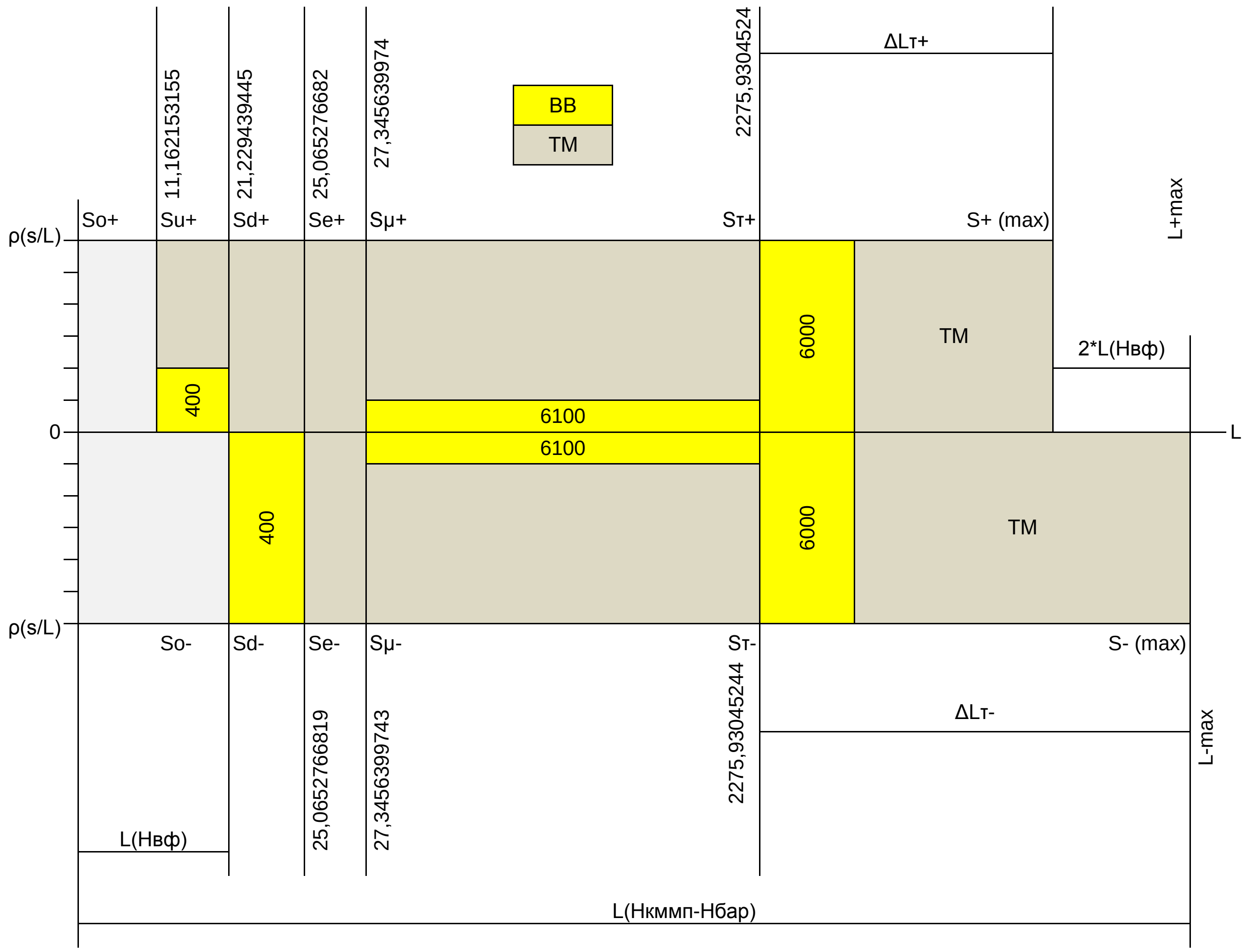


Fig. 12_4. The diagram of the dependence of the number of simples of each species from their lengths.

In this diagram, above the 0L axis, there are simples with a positive charge, and below the axis 0L there are simples having a negative charge. The regions of the diagram, painted blue, correspond to the simples of S_0, shortened to zero length. Justification of the size of the zero-length range of negative symbols, incl. in the region Su-, is given in Chapter 2. The number of simples for the formation of 100 relict neutrons of matter (substance = 100 relict neutrons) is indicated by yellow color. The boundaries of the regions of the number of the substance (SUB) and dark matter (DM) are shown conditionally.

The number of simples of each species in the diagram is equal to the area of the corresponding rectangle. Bearing in mind that at the time of simples-spirales generation, the range of lengths of negatively charged simples is greater than the range of lengths of positively charged simples, this means that the number of negatively charged simples must be greater than the number of positively charged simples. The whole difference after the quantization of the lengths of the simples-spirales "goes" to Sτ- and will be equal to the difference of the negatively and positively charged simples-tau. The difference in their number is proportional to the difference between the maximum lengths of the negatively and positively charged simples and, as we showed above, see formula (6), is proportional to the doubled magnetic moment of the virtual photon:

$$\text{Number } (S\tau-) - \text{Number } (S\tau+) \sim L_{S-(max)} - L_{S+(max)} \sim 2H_{VF} \quad (7)$$

$$\text{or } L_{S-(max)} - L_{S+(max)} = 2 * L(H_{VF}) \quad (8)$$

$$\text{or } \Delta L(S\tau-) - \Delta L(S\tau+) = 2 * L(H_{VF}) \quad (9)$$

Taking the last diagram as a basis, we proceed to calculate the number of simples of each species formed in our test area and their distribution to substance (relic neutrons) and Dark matter.

Calculation of the number of simples of each species in the test area and their distribution to substance and Dark matter

The selected test area of space represents a sphere in which 100 relic neutrons are formed. For the formation of 100 relict neutrons, we need: 6000 Sτ-, 6000 Sτ+, 6100 Sμ-, 6100 Sμ+, 400 Sd-, 400 Su+. In the diagram above, they are colored yellow. The boundaries of all regions are depicted conditionally, this is due to the fact that we do not yet know how many simples of each kind were formed in our test area of space.
But we already know that the number of simples of each species is determined by the height of the ball belt, i.e. the interval of the initial lengths of the simples-spirales of a given type.
We know the values of the length intervals (the height of the ball belts) of the formation of six of the nine real kinds of simples (Su+, Sd+, Se+, Sμ+, Se-, Sμ-), we gave their values above. But we do not know the values of the length intervals (the height of the ball belts) of the other three kinds of symbols (Sd-, Sτ+, Sτ-), although we know about the first of them, ΔL (Sd-), that it is determined by the parameter L (H_{VF}), the range of which we know.
For the ranges of intervals of lengths of positive and negative tau-simples ΔL (Sτ+), ΔL (Sτ-) we know their relation, see formula (9). We also know that LS- (max) = L (HSPMF -HBAR). By adopting, purely phenomenologically, H_{BAR} = H_{VF}, we can use the L (H_{SPMF}) parameter to calculate ΔL (Sτ+) and ΔL (Sτ-).
Thus, to calculate the number of simples of all kinds, we need to perform a calculation with two unknown variables, the range of variation of one of them L (HVF) is known to us, and the range of the second, L (HSPMF), on the one hand, we also know that L (Sτ), and on the other hand we can take with some reserve.

<u>The procedure for calculating the simples in the test area and their distribution on SUB and TM</u>
When calculating, we need the following data:

	L (d)	ΔL (d)	m (МэВ)	Кол(S+)$_{BB}$	Кол(S-)$_{BB}$
Sτ =	2275.9	см. расчет	7.7331282	6000	6000
Sμ =	27.35	2248.6	0.0929147	6100	6100
Se =	25.07	2.28	0.0929147	0	0
Sd =	21.23	3.84	0.0721331	0	400
Su =	11.16	10.07	0.0379266	400	0

We will calculate the intervals of the lengths of the simples by the following formulas:

L (H_{VF}) = L (H_{BAR}) = from 21.23 (d) to 25.07 (d)
L (H_{SPMF}) = from 2275.9 (d) to 2700 (d)
ΔL (Sd-) = L (Se-) - L (H_{VF})
L (Sτ-) max = L (H_{SPMF}) - L (H_{BAR})
ΔL (Sτ-) = L (Sτ-) max - L (Sτ)
ΔL (Sτ +) = ΔL (Sτ-) - 2 * L (H_{VF})
L (Sτ +) max = L (Sτ) + ΔL (Sτ +)

Calculation of the number of simples will be carried out according to the following formulas:

Number (Sd-) = 400
ρ = Number (Sd-) / ΔL (Sd-) = 400 / ΔL (Sd-)

$$Number\ (Su+) = \rho * \Delta L\ (Su+)$$
$$Number\ (Sd+) = \rho * \Delta L\ (Sd+)$$
$$Number\ (Se+) = \rho * \Delta L\ (Se+)$$
$$Number\ (Se-) = \rho * \Delta L\ (Se-)$$
$$Number\ (S\mu+) = \rho * \Delta L\ (S\mu+)$$
$$Number\ (S\mu-) = \rho * \Delta L\ (S\mu-)$$
$$Number\ (S\tau+) = \rho * \Delta L\ (S\tau+)$$
$$Number\ (S\tau-) = \rho * \Delta L\ (S\tau-)$$

Calculating the excess of negative symbols:

$$Number\ (S+) = Number\ (Su+) + Number\ (Sd+) + Number\ (Se+) + Number\ (S\mu+) + Number\ (S\tau+)$$
$$Number\ (S-) = Number\ (Sd-) + Number\ (Se-) + Number\ (S\mu-) + Number\ (S\tau-)$$
$$Total\ (S) = Number\ (S-) + Number\ (S+)$$
$$Surplus\ (S-) = Number\ (S-) - Number\ (S+)$$
$$Surplus\ (S-)\% = Surplus\ (S-) / Total\ (S)$$

Calculation of the masses of simples will be carried out according to the following formulas:

$$\Sigma m\ (Su+) = Number(Su+) * m\ (Su+)$$
$$\Sigma m\ (Sd+) = Number(Sd+) * m\ (Sd+)$$
$$\Sigma m\ (Sd-) = Number(Sd-) * m\ (Sd-)$$
$$\Sigma m\ (Se+) = Number(Se+) * m\ (Se+)$$
$$\Sigma m\ (Se-) = Number(Se-) * m\ (Se-)$$
$$\Sigma m\ (S\mu+) = Number(S\mu+) * m\ (S\mu+)$$
$$\Sigma m\ (S\mu-) = Number(S\mu-) * m\ (S\mu-)$$
$$\Sigma m\ (S\tau+) = Number(S\tau+) * m\ (S\tau+)$$
$$\Sigma m\ (S\tau-) = Number(S\tau-) * m\ (S\tau-)$$
$$m\ (S\_all) = \Sigma m\ (S)$$

Mass of substance in the test area:

$$m\ (SUB) = 400 * m\ (Su+) + 400 * m\ (Sd-) + 6100 * m\ (S\mu+) + 6100 * m\ (S\mu-) + 6000 * m\ (S\tau+) + 6000 * m\ (S\tau-)$$

The mass of Dark matter in the test area:

$$m\ (DM) = m\ (S\_ALL) - m\ (SUB)$$

The final result of our calculation should be the determination of the ratio of the mass of simples that went to the formation of substance and Dark matter:

$$SUB(\%) = m\ (SUB) / m\ (S\_TOTAL)$$
$$DM(\%) = m\ (DM) / m\ (S\_TOTAL)$$

Note: With a strict calculation of the mass of the DM, we would additionally have to subtract another mass of annihilated short simples-spirales. We do not have data to determine the mass of these simples. Its share could be taken into account given a certain probability of this process. However, we did not do this, taking into account the fact that the mass of short simples-spirales (and, as will be seen from the calculation, their number) is much less than the mass of simple-bagels that do not participate in the annihilation process.

Calculation results

In total, we calculated the 34 parameters for the 21st L (HVF) value and for the 21st L (SPMF) value. The table with the results of calculations is a table of 35 columns and 440 rows. We do not have the opportunity to bring it all up, we give only the most characteristic results of calculating some parameters in the form of histograms.

On the histograms along the axis of the rows, the values of the parameter L (HVF) from 21.23 (d) to 25.07 (d) are plotted, and the values of the parameter L (HSPMF) from 2307 (d) to 2707 (d) are plotted along the second axis.

The initial limits of the L (HSPMF) change were taken wider, in the final version we reduced them, removing the values at which the calculated parameters take negative values.

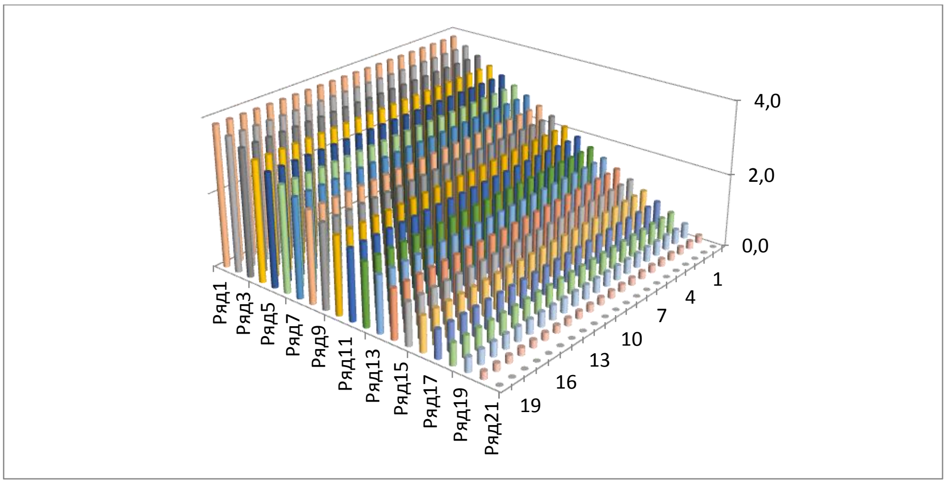


Fig. 12_5. The dynamics of the interval ΔL (Sd-)

* For reference, the dynamics of the intervals ΔL (Sτ +) and ΔL (Sτ-) are also linear.

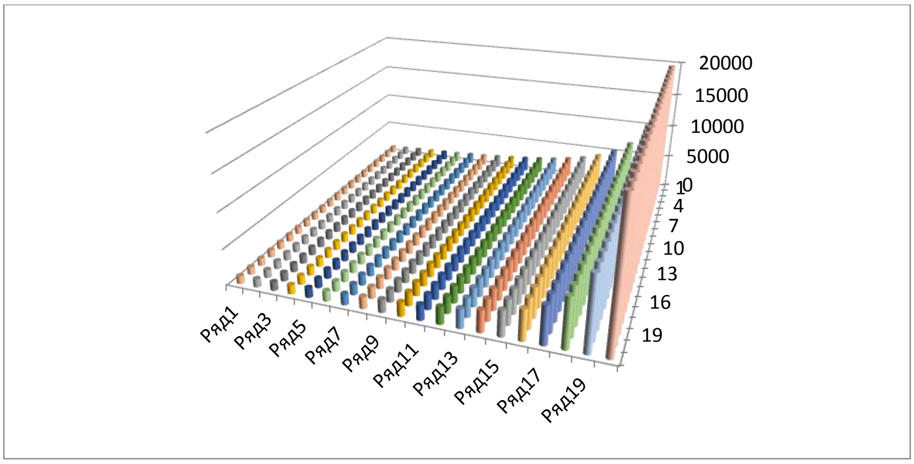


Fig. 12_6. Dynamics of change in the number of simples Su+

Analogous dynamics of the change have the estimated number of simples Sd+, Se+, Se-, Sμ+, Sμ-. But the number of Sd- symbols, as laid down in our calculation algorithm, is a limitation of reactions of relic neutron synthesis and constantly (400 pcs.) for all calculation combinations.
A somewhat different form has a graph of the dynamics of the change in the number of simples Sτ+ and Sτ-.

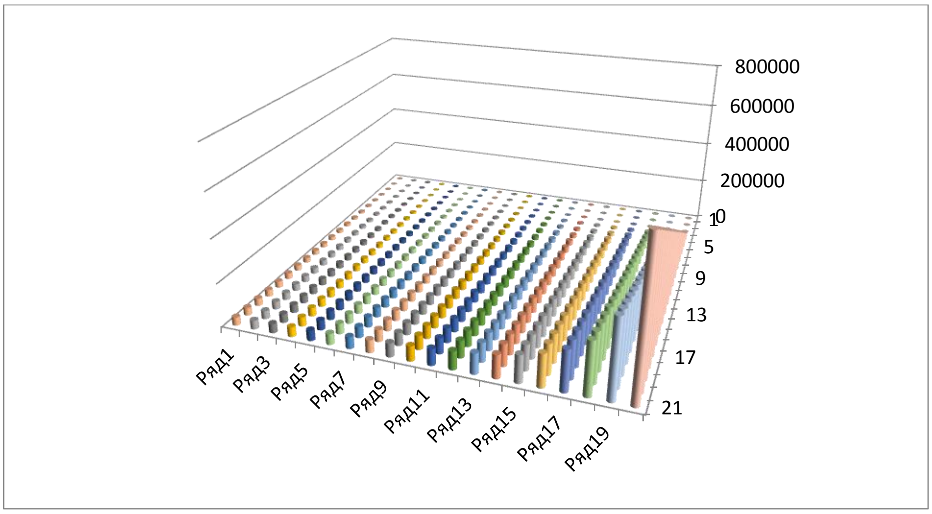


Fig. 12_7. The dynamics of the change in the number of simples Sτ+ (Sτ-)

Analysis of the calculation of the masses of simples and other parameters of the universe

Graphs of the dynamics of changes in the masses of simples are completely analogous to the graphs of the dynamics of the change in their number.

The following graph shows the dynamics of the change of one very important parameter. We called it the "electromagnetic coefficient of the universe" and it is calculated as a ratio:

$$K = HSPMF \;/\; HVF \text{ or } K = L\,(HSPMF) \;/\; L\,(HVF)$$

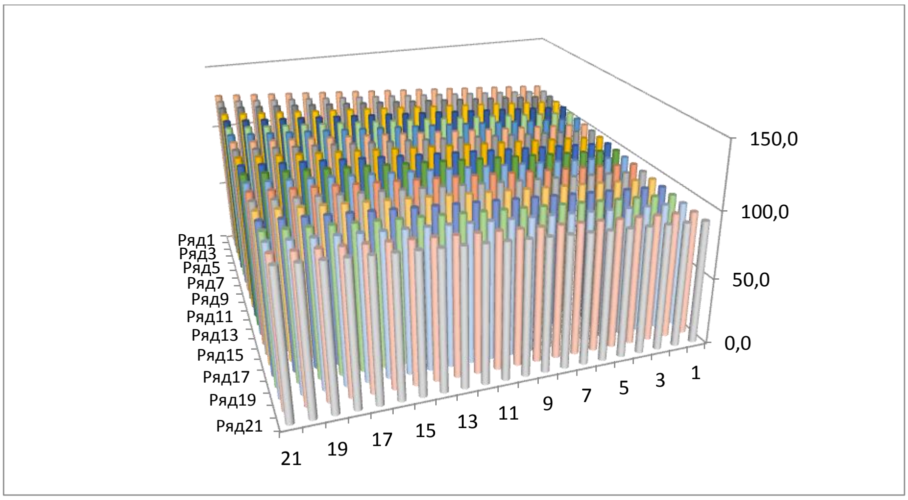


Fig. 12_8. Dynamics of the change in the electromagnetic coefficient K

The values of this indicator is, as it were, fundamental for our entire calculation. Its physical meaning is difficult to overestimate. It is he who determines the ratio of the power of magnetic fields (the values of the magnetic moments) of two components, a virtual photon and a short-term powerful magnetic field, from the interaction of which simples were born. To each of their relations there corresponds a certain column of the histogram, which, figuratively speaking, corresponds to a specific universe. And similar columns of all other histograms give values of the corresponding parameters of this universe.

So, we counted a whole group of universes, having determined a specific number of simples of all kinds formed in each universe. As we see it is different.

Which of these Universes is "our"?

As a key (control parameter) for filtering out "our" Universe, we used the parameters of the percentage of substance, Dark matter and Dark energy in the calculated Universes.
As control values, we used data on the relationship between substance, Dark matter and Dark energy in the Universe, cited by Andrei Vibe in [23]:

Substance (SUB) - 4%
Dark matter (DM) - 23%
Dark energy (DE) - 73%

Considering that we are now engaged in the analysis of a purely material substance of the universe, formed from simples, Dark energy can be temporarily "taken out of brackets". Taking all the simples formed as 100%, it turns out that they are distributed between substance and Dark matter in the following ratio (by mass):

Substance (SUB) = 14.8%
Dark matter (DM) = 85.2%.

It should be noted that many other sources give other data on the ratio of Substance and Dark matter in the universe. Unfortunately, from our calculation does not follow the true ratio of SUB and DM in the universe. In our calculation, this ratio is used as a control parameter for selecting a specific calculation option corresponding to our universe. If this ratio will be refined, then in our sample the resulting column of our universe will be "slightly" shifted.
For clarity, we present the results of calculating the percentage of matter in the calculated Universes in the form of a table and a histogram, while reducing the displayed part of the calculated data within reasonable limits.

		1	2	3	4	5	6	7
	$L(H_{ВФ})\backslash L(H_{КММП})$	2507	2527	2547	2567	2587	2607	2627
Ряд1	21,229	21,13%	19,70%	18,46%	17,36%	16,38%	15,51%	14,72%
Ряд2	21,421	20,10%	18,74%	17,55%	16,51%	15,58%	14,75%	14,00%
Ряд3	21,613	19,07%	17,78%	16,65%	15,66%	14,77%	13,99%	13,28%
Ряд4	21,805	18,04%	16,81%	15,74%	14,80%	13,97%	13,22%	12,55%
Ряд5	21,997	17,00%	15,85%	14,84%	13,95%	13,16%	12,46%	11,83%
Ряд6	22,188	15,96%	14,87%	13,93%	13,09%	12,35%	11,69%	11,10%
Ряд7	22,380	14,92%	13,90%	13,01%	12,23%	11,54%	10,92%	10,37%

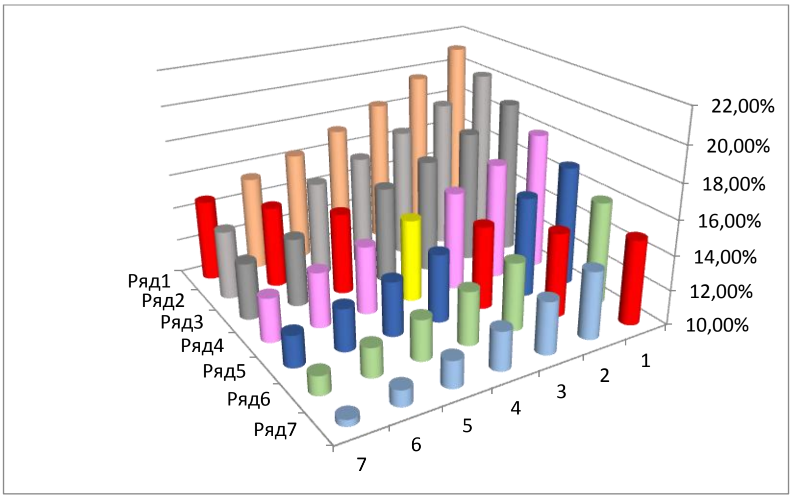


Fig. 12_9. The percentage of Substance in the calculated Universes, "our" universe is colored yellow

As we see for the value of the parameter SUB (%) = 14.8% are corresponds to the "our" Universe with the initial parameters L (H_{VF}) = 21.8 (d), L (H_{SPMF}) = 2567 (d) and, respectively, K = 117, 7.
The remaining calculated parameters of the "our" universe have the following values:

∆L(Sd-)	3,26
L(Sт-)max	2605,20
∆L(Sт-)	329,26
∆L(Sт+)	285,66
L(Sт+)max	2561,59
Number (Su+)	1235
Number (Sd+)	471
Number (Sd-)	400
Number (Se+ -)	280
Number (Sμ+ -)	275861
Number (Sт+)	35045
Number (Sт-)	40395
Number (S+)	312891
Number (S-)	316936
Number (S-) – Number (S+)	4044
slight excess (S-)% от Σ(S)	0,6%
ρ(S) по Sd-	122,7
Σm(Su+)	46,8
Σm(Sd+)	33,9
Σm(Sd-)	28,9
Σm(Se+ -)	26,0
Σm(Sμ+ -)	25631,5
Σm(Sт+)	271005,5
Σm(Sт-)	312378,6
ΣΣm(S)	634808,8
m(BB)	93975,1
m(TM)	540833,7

We remind you that we made a reservation above about the possible refinement of the parameters SUB (%) and DB (%), taking into account the probabilistic process of annihilation of a certain fraction of short simples-spirals, all other results of our calculation should be specified accordingly.

We draw your attention that according to our calculations, the interval size ΔL (Sd-) is slightly smaller than the interval ΔL (Sd+). This is explained by the fact that the length L (HVF) is slightly larger than the length L (Sd) (in the diagram they are conditionally shown to be equal). These parameters have completely different physical nature and their "coincidence" should cause "unnecessary" questions, which we "safely" avoid.

Another very important among the calculated parameters is the excess of negatively charged simples equal to 0.6%.

Is this a lot or a little? Readers of course already understood that in S_theory it is the excess of negatively charged simples that is the basis of those processes in the universe that are commonly identified with the Dark energy.

A little bit later we will try to determine the location of negatively charged Dark matter in the Universe, and also simulate and calculate the resulting equilibrium and dynamic processes behavior of matter.

But before that we need to finish the question of determining the composition of simples in Dark Matter and to model which aggregates of them could have formed.

But first, until we have gone far from the many universes we calculated, let's talk about the reality of the existence of all this diversity of universes.

The reality of the existence of a set of calculated Universes

We must admit that we felt the latent desire to declare - here it is the diversity of the Universes formed on unified physical principles, from a single set of simples: Su+, Sd+, Se+, Sμ+, Sτ+, Sd-, Se-, Sμ-, Sτ- , but with a different ratio of substance and Dark matter, and a different excess of negative simples.

But, soberly estimating the result, we have to state that all this diversity of the calculated Universes is virtual (calculated). In all these calculations, there is only one real "our" Universe, the one we have given here (with the possible refinement).

Why are we so categorical?

The fact is that virtual photons can not have different magnetic moments. Likewise, most likely, extra-large black holes burst after reaching some critical parameter, and hence the magnetic moment of the short-duration magnetic field that expire from them is also constant.

An accurate knowledge of the ratio of the mass of substance and the Dark Matter allows us to calculate this single "our" Universe, or rather, to clarify all its parameters. There are no other universes with other values calculated by us.

In more detail about the multiplicity of universes and extra-large black holes, we'll talk in the next chapter "Antimatter in S_theory", and about the model of formation and constancy of the parameters of virtual photons in the chapter "Fourth Physics".

The Anthropic Principle (Ed. 3)

S_theory admits, and even presupposes, the possibility of the multiplicity of the processes of the formation of the Universes. However, the S_model of the formation of all Universes, due to the constancy of the parameters of virtual photons and the phenomenologically assumed constancy of the critical mass of the bursting super-large black holes, as well as the deterministic processes of distribution of the simples over the length spectrum in the process of their formation, shortening to resonance lengths, convolution into bagels and subsequent spectrum formation of isotopes, allow to draw a conclusion about the identity of all formed Universes.

Scheme of experiment on the formation of simples (3rd part)

Only that we calculated the electromagnetic coefficient of the universe:

$K = H_{SPMF} / H_{VF} = L (H_{SPMF}) / L (H_{VF}) = 117.7$

This coefficient gives a certain reference value of the strength of the magnetic field needed to stretch the virtual photons in the simples-spirales. Unfortunately, we have not found estimates of the magnitude of the magnetic moment of virtual photons and therefore can not calculate the magnetic field strength of the bursting black hole.

In Chapter 15, we will discuss the scheme for the formation of virtual photons and once again return to the question of their energy and the intensity of their magnetic field. If we manage to do this, we will know what intensity of the magnetic field is necessary to irradiate the vacuum, so that simples are born.

Dark matter

We calculated the number and mass of simples of all types formed in some test space, the number and mass of simples that left for the formation of substance (100 relict neutrons), the number and mass of simples remaining in the Dark Matter (see Table-fig. 12_10).

Parameters	Total	Sub	DM
Number (Su+)	1235	400	835
Number (Sd+)	471	0	471
Number (Sd-)	400	400	0
Number (Se+)	280	0	280
Number (Se-)	280	0	280
Number (Sμ+)	275861	6100	269761
Number (Sμ-)	275861	6100	269761
Number (Sτ+)	35045	6000	29045
Number (Sτ-)	40395	6000	34395
Number (S+)	312891	12500	300391
Number (S-)	316936	12500	304436
Numb (S-) – Numb (S+)	4044	0	4044
slight excess (S-)% from Σ(S)	0,6%	0,0%	0,6%
ρ(S) по Sd-	122,7	122,7	122,7
Σm(Su+)	46,8	15,2	31,7
Σm(Sd+)	33,9	0,0	33,9
Σm(Sd-)	28,9	28,9	0,0
Σm(Se+)	26,0	0,0	26,0
Σm(Se-)	26,0	0,0	26,0
Σm(Sμ+)	25631,5	566,8	25064,7
Σm(Sμ-)	25631,5	566,8	25064,7
Σm(Sτ+)	271005,5	46398,8	224606,7
Σm(Sτ-)	312378,6	46398,8	265979,9
ΣΣm(S)	634808,8	93975,1	540833,7
%	100%	14,8%	85,2%

Fig. 12_10. The number and mass of substance and Dark Matter

As follows from these data, the universe has a negative charge, due to a slight excess of the number of negatively charged simples over the number of positively charged simples (~ 0.6%). It should also be noted that the entire difference in the charges of the simples "went" into the Dark Matter.

What is the further "fate" of the simples that have gone to Dark matter?

In total, four groups of simples were not in demand for the formation of substance :

1. Su+ (835 pcs.) and Sd+ (471 pcs.)
2. Se+ (280 pcs.) and Se- (280 pcs.)
3. Sμ+ (269761 pcs) and Sμ- (269761 pcs)
4. Sτ+ (29045 pcs.) and Sτ- (34,395 pcs.)

What was formed from these simples?

1. Simples-spirales of the first group can be combined into blocks and form quarks u+ u d+. But, since they both have the same positive charge, they can not form a quark ring. For the same reason, they can not annihilated. At the end of the resonant lifetime of that the simples-spirales, they will truncate to zero, leaving behind a certain

number of gamma quanta and a kind of "dust+" of positively charged reverse simples ("halves") of electron neutrinos (antineutrinos).

2. Simples-spirales of the second group do not form blocks, since have too long for this length, their "fate" is complete annihilation, which also results in gamma quanta and full electron neutrinos (antineutrinos). The process of annihilation can go "interspersed" with the first group of spirals, the total result of processes 1 and 2 will not change from this.

3. Simples of the third group are rolled up into bagels and combined in pairs ("+" with "-"), forming 269761 mu-neutrinos, more of which are fly on the expanses of the universe. Because of the presence of magnetic moments in the mu neutrino, they can form blocks (oscillations).

4. Simples of the fourth group also turn into bagels, most of which are combined in pairs ("+" with "-") and form 29045 tau neutrinos. They can also form blocks and with their magnetic field they can "suck in" themselves mu neutrino blocks, forming bicoaxial blocks. But, due to the lack of blocks of simples-spirales (~ quarks) with different charges, the bicoaxial blocks can not unite with each other into some nucleon-like aggregates.

The remaining 5350 pcs. the negatively charged tau-simples-bagels are divided into two parts. One of them (1,306 pieces) adsorbs on itself the "dust+" (positively charged reverse simples ("halves") of the electron-neutrino) and becomes electrically neutral. The second part (4044 pcs.) bears a non-compensated negative charge, which is approximately 0.6% of the total electric charge of all the simples in the universe.

The location of dark matter in the universe.

Physicists discuss two options for the location of Dark Matter in the Universe:

The first option is a certain halo (shell) around the Galaxies at a fairly large distance.

The second option is a uniform distribution of Dark matter in the entire space of the universe.

Our calculation, which indicates the presence of a negative electric charge in the Dark Matter, suggests that Dark matter is located in the universe in a mixed version. Rather, this issue has some dynamics in time in the process of the formation of the universe.

At the first stage, with the formation of simples and nucleosynthesis of relic neutrons, the excess of simples that have receded into the Dark Matter, including those having a non-compensated negative charge, as well as the formed relic neutrons, were distributed uniformly in the Universe.

At the second stage, in the process of gravitational conglomeration of matter into clouds and galaxies, this process also affected the Dark Matter. Some of its parts, at the same time, could behave differently.

Relatively light mu neutrinos that did not form blocks could be poorly involved in this process and are still "traveling" around the universe.

Mu-neutrinos and tau neutrinos, which formed neutral blocks, were "involved" in the process of gravitational conglomeration "to the fullest."

These blocks with their magnetic moments can capture negative tau-simple-bagels with adhering to them "dust +" and become electrically neutral, as well as negative tau-simples-bagels with uncompensated charge (not more than 1 unit to each block).

All these blocks of Dark Matter, due to their inability to form large stable conglomerates and having a relatively small mass in comparison with the conglomerates of matter, turned out to be "squeezed out" on the periphery of galaxies and formed a halo of galaxies.

Taking into account the weak gravitational connection of relatively light halo particles with a "twisted" substance of galaxies, the angular velocity of rotation of the halo relative to the galaxy is practically zero. From the "fall" halo to the substance of the galaxy "saves" the negative charge of some of the blocks of Dark Matter. They by force their electrostatic repulsion to balance the gravitational pull of the halo toward the center of the galaxy, forming an equilibrium system.

As a result, the galaxies themselves acquire negative charges at the expense of their halos, under the action of which galaxies repel each other, which is experimentally recorded as the accelerated run-up of galaxies and is interpreted as the presence of the Dark Energy in the Universe.

Dark energy

Dark energy in the universe is responsible for the accelerated run-up of galaxies. According S_theory reason of dark energy in the universe is an excess of negatively charged tau-simples, inbound to dark matter. This explanation of the Dark Energy is not new, many researchers have suggested it. What is new is an explanation of the cause of the excess negative charge in our universe, which gives S_theory .
Thus, dark energy, the repulsive matter in our universe explained by electrostatic repulsion from each other negatively charged particles of dark matter.
Very important is the question - which part of the negative tau-simples of Dark Matter is conglomerate in the halo of galaxies, and which part remains "not in demand" and is distributed in the space of the Universe.
We could not draw up a model for calculation in order to answer this question. This question requires additional study.
It should be noted that the energy basis of the Dark energy, which leads to the repulsion and expansion of galaxies, is the same energy of a short-term powerful magnetic field, pumped into virtual photons and stretched out from the simples-spirales, and which gave them the appropriate mass and charge.

Why Dark Matter does not interact with photons (insert from 09.11.2017)

It is known that DM does not interact with real photons (RP). S_ theory explains this fact as follows.
The maximum particle size of the DM can be estimated equal to the diameter of the tau-simples and the tau-neutrinos (~ 0.43 fm). Even if tau neutrinos are assembled into blocks, the length of these blocks hardly exceeds this size. But the minimum RP vortex size (wavelength), even for X-rays, is ~ 103 fm. There are also gamma quanta, in which the wavelength is smaller. But gamma quanta are produced in the interior of stars under nuclear reactions, and as long as they "get out" onto the surface of the star, they repeatedly interact with the stellar matter, lose some of their energy and turn into photons of X-ray, ultraviolet radiation and visible light. The size of the vortices of all these photons is several orders of magnitude larger than the particle size of the DM, so they simply "do not notice" them in space without entering into any interaction with them. And only gamma quanta of very high energy with very small dimensions of their electric and magnetic vortices can probably interact with DM particles, but these events are probably very rare and remain unobserved.
Why, then, do the same photons interact (excite) electrons whose size in ST (0,028 fm) is even smaller than the particle size of DM? The matter is that photons do not interact with a single electron, but with electron shells of atoms, whose dimensions are ~ 105 fm, which is quite commensurate with the dimensions of the vortices of high-energy photons.
This explanation of the selective interaction of the RP with different objects, depending on their size, requires, of course, a refinement presented in the first chapter of the S-model of absorption (excitation) and emission of photons by electrons. We will consider that this question requires additional investigation.

Remarks on the executed calculation of Dark Matter (insert as of 16.10.2017)

1. Our Universe is to some extent "idealized", in terms of the number of simples formed.
We mean that all 400 of the simulated Sd-simples formed in the test area went into the formation of matter (relic neutrons). In fact, of course, some of them (and, quite probably, not a small part) were "burned in the furnace" of the annihilation of short simples-spirales.
And this means that there were actually more Sd- simples. For an equal density per unit of the initial length of the simples, the number of simples of all other kinds should also be larger. At the same time, only short simples-spirales are burned in annihilation, while Sμ and Sτ shrink into bagels and avoid this fate. At the same time, the

number of simples necessary for the formation of 100 relic neutrons remains unchanged. As a result, there should be an increase in the number of simples-bagels going to Dark Matter. This means that the parameters SUB% and DM% will also change. So "our real" Universe is somewhere in another point (the calculation cell), and the universe calculated by us and the values of its basic parameters of HVF, HSPMF , K and Excess_S-(%) must be changed. But unfortunately, we do not know and could not perform any specifying calculation of the share of the simples-spirales born and burning in the annihilation and, accordingly, to correct the calculation of the number of simples of all kinds.

In addition, it is also necessary to take into account the probabilistic character of the formation of the simples-blocks in the simples-plasma and their subsequent integration into toroidal aggregates of relic neutrons. All this speaks about the estimated (approximate) nature of the calculation performed by us and the need to refine its algorithm (methodology).

2. On October 9, 2017 news lines brought the message "The missing half of the mass of matter in the Universe was found" [31]. These are the previously predicted WHIM threads that connect galaxies with each other. The substance in these filaments is approximately six times denser than the average in the universe. It is assumed that they can include up to 30% of the missing baryonic matter. With this in mind, the following composition of our universe is given: 72% - dark energy; 23.4% - dark energy; 4.6% - baryonic matter. The ratio of dark matter to substance is 85.6% to 16.4%, which is different from the data we used in calculating the data (85.2% to 14.8%), but this difference is not cardinal.

Taking into account the comments made, we find it premature to attempt an "justified" calculation of the balanced composition of galaxies from matter and the halo of Dark Matter. In our opinion, there is still not enough reliable data for this. We would just like to note that probably not all negative tau-simples with uncompensated charge "clung" to blocks of Dark Matter and got into the halo of galaxies. Part of them, probably, evenly fills intergalactic space.

Insert (Americans again overtake us)

As one would expect, with the next immersion in the "abyss" of archives and current scientific news, we met a publication from 2013 [27] in which two American physicists Chiu Man Ho and Robert J. Scherrer theoretically established that Dark Matter particles consist of fermions Majorana, generating anapolis (in common parlance, called "bagels").

We are already "accustomed" to the fact that many of our conclusions and consequences from S_theory regularly "resonate" with the new results of the studies of other authors, finding in them an indirect confirmation of the correctness of the approaches and consequences of S_theory. But we will not pursue the publication of our work as soon as possible, until we finish the S_ analysis of all fields of physics and we will not be convinced that they all theoretically "are stitched together" on the basis of the Theory of Electromagnetic Vortices and S_theory.

Conclusion of Chapter 12

In this chapter, the S-model of the formation of simples from virtual photons under the influence of a short-time powerful magnetic field was detailed and formalized. This made it possible to calculate the number, charge, and mass of the simulated simples of each species and calculate their distribution for substance and Dark matter.

In the calculation, in addition to the previously calculated parameters of the simples, a known calculated-experimental ratio of the mass of substance and dark matter in the universe was involved.

The totality of the calculation results allows one to conclude that negatively charged simples predominate over positive (about 0.6%), and that give the total negative charge of Dark matter, and the formation of a halo from Dark matter around galaxies, and the mutual repulsion of galaxies from each other, which leads to their accelerated run away, and it is customary to interpret it as Dark Energy.

A multifactor analysis of the calculation results allows us to draw an additional conclusion about the identity of all the emerging Universes (Anthropic principle, Rev.3).

Chapter 13. Antimatter in S_theory. Pulsating Universes

In the ST_Universe considered by us there is no mass formation of antimatter (AM). Of course, it can be formed as a result of nuclear reactions "accidentally" or "purposefully" if there are appropriate conditions for the formation of the corresponding blocks of simples from which antiprotons, antineutrons and antielectrons are formed. But the scale of such nuclear reactions is probably insignificant.

There is no antimatter?

S_theory responds to this question - there is (!), And not just there is, but the whole AM_Universe, equal in mass to our Universe!

Readers probably already paid attention to the fact that we are giving a presentation of the material and constructing all S-models of S_theory for one end of a bursting black hole (LBH). At the other end of the LBH, there is an opposite magnetic pole, from which a powerful short-duration magnetic field (SPMF), which has the opposite direction of the magnetic moment, also breaks out. And the result of all the described processes on the other end of the LBH will be diametrically opposite.

Those, longer and in a larger number will be formed not negatively, but positively charged simples. As a result, there will be no Su+ simples, there will be an excess of positively charged tau simples, relic antineutrons will be formed, and AM_Universe will be formed which will have an excess positive charge. The relic antineutrons formed will decay into antiprotons and antielectrons, and so on. etc.

It is well that formed Universe and AM_Universe will be "thrown away" by the Big Bang in opposite directions with large impulses. However, in this case, they have the opposite electrical charge. So, it is possible that their mutual attraction can "eventually" stop their dispersal and they will go "on a date" with each other.

It is very likely that they will "come" to the "meeting place" with some parallax. In this case, they will begin to rotate relative to one another (the common center of mass, if one may so express it). But at the same time, in the place of their closest rapprochement (and perhaps also in contact), the processes of mutual attraction of individual objects of the two Universes begin.

What will happen when these objects will be meet?

Theoretically (according to S_theory) everything can "dispense", there will be no mass annihilation of matter and antimatter.

Why? According to the S_theory of annihilation, simples-spirales with opposite charges are attracted to each other by powerful magnetic fields at their ends and the appearance of short-circuiting azimuthal electric vortices at the junction. Matter and antimatter in our two Universes consist mainly of bagels, in which a powerful magnetic field is "hidden" inside simples. After all, the proton and the electron also have opposite electrical charges, but they do not annihilate, but "peacefully" spin, forming an atom. Yes, and electrons with positrons can "peacefully" form electron-positron pairs.

But this option is unlikely, because the collision of objects will occur at a high speed with a large number of frontal collisions of particles of matter and antimatter, as in accelerators. As a result, there will be mass burst of the simple-bagels to the simples-spirales and mass annihilation of the simples-spirales.

And if nevertheless not all the simples-spirales are annihilated, then the remaining simples-spirales will be to assemble into unipolar blocks, curl up into bagels, form doublets or other "aggregates", and sooner or later they will form a Black Hole. BH begins to suck in itself and matter from our Universe and antimatter from AM_Universe , "crush" their particles on the simples-spirales and "swallow" them inside of their super-bagel. The process of annihilation will be replaced by the growth of the black hole.

Over time, the black hole will turn into a super black hole (SBH), and who knows, maybe this process is already going somewhere on the outskirts of our universe.

And someday the SBH will absorb all the matter of both Universes, and will burst, and everything will start again.

Given that the conditions for the formation of AM_Universe , are absolutely symmetrical to the conditions for the formation of our Universe, we can assume that their parameters mirror the same, including the conditions for energy supply and evolutionary development.
And, that in the "bowels" of our double, AM_Universe, somewhere there is an anti_Earth , on which there live anti-earthmen.
But this is already a "inference", which could be serve as the basis for the plot of a fantastic novel about the meeting of earthlings and anti-earthmen. We will not develop this topic and calculate the probability of this event (it is obvious that it is zero).
It remains for us to sum up the main results of the S_theory, after which we can go on to the last chapter of our work "The Fourth Physics" and consider the question of the formation in space of virtual photons, primary symbols and the first BBH.

Insert from 06/26/2017 (Science News)

And again, S_theory lags behind the publication (this is the sixth time since we begin to wrote our work). Today on the site https://lenta.ru/news/2017/06/26/antimatter/ there was a message that Salvador Robles-Perez from the Institute of Fundamental Physics (Madrid, Spain) offered an explanation for the predominance of matter over antimatter in the universe [26].
The theory he proposed assumes the existence of a multiverse. In it, the universe was born with another world, while in the first there were particles, and in the second - antiparticles. The two universes are separated by a potential barrier that does not allow the annihilation of matter and antimatter.
We once again lag behind the publication of our work (this is the sixth case, see [2, 14, 22, 25, 26, 27]).
And what do we do - be happy or upset?
Of course, rejoice!
Judge for yourself, all these studies were carried out in parallel with us, or long before us, but answer private questions, often "relying" on a completely different methodological basis.
In our work, all these questions and many, many other problems, as previously solved in one form or another, or not solved, are considered and find their solution on a single conceptual basis, based on the physical model of the formation of simples.
So, that all the data of the research of these authors, with proper verification and confirmation, indirectly confirm the correctness of our concept S_theory.

Conclusion of chapter 13

The S_theory proposed by us gives an unambiguous answer about the formation of an absolutely identical quantity of matter and antimatter in the form of two symmetrical separated Universes (from two opposite sides of the BBH), which, moreover, have opposite non-compensated electric charges.
The latter circumstance allows us to assume that the momentum of the Universe run-ups, obtained by them during formation, can be "suppressed" by the force of their electrostatic attraction with time and the dispersal of the Universes can be replaced by their movement towards each other.
S_theory asserts that the meeting of the Universes will not lead to their complete annihilation of matter and antimatter (simpile-spiral), but on the contrary, may form many symple-bagels with opposite electric charges, which form stable objects (pairs), the conglomeration of which will generate the formation of a super large black hole (SBH).
The SBH eventually absorbs all the matter and antimatter of the two Universes and, upon reaching critical mass will burst, forming an BBH, from which a powerful short-term magnetic field "pours out" into the surrounding space, stretching virtual photons into new simples - new two Universes will be born.

Chapter 14. Generalized RESULTS of the S_theory (ed. ST2 of 04.11.2017)

List of areas of physics covered by S_theory

We have completed a great work on the formation of S_theory - the physical model for building the universe on the basis of electric and magnetic vortices. Within the framework of the work on the basis of a single conceptual approach, the solutions for a number of basic questions from different areas of physics are proposed:

1. The physical model of the creation of first-particles (first-bricks) of matter in the force field is the stretching of virtual photons by a powerful magnetic field into the simples-spirales and the folding of the latter into simple-bagels (S).
2. The three basic structural elements of the simples (internal magnetic vortex, toroidal electric vortices and azimuthal electric vortex) provide the appearance of nine properties (parameters) of simples: shape, mass, density, electric charge, magnetic moment, spin, elasticity, stability, spectrum of resonance lengths.
3. S_model of constructing from the simples of individual elementary particles and S_model of relic neutron (nr). S_model of decay of relic neutron into proton, electron and neutrino. Reverse calculation of the values of the basic parameters of simples on the basis of the parameters of elementary particles.
4. The idea of a "defecton" (mu neutrino bursting in nucleons) in the course of all nuclear reactions, S_models of the process of nr_ nucleosynthesis of isotope cloud and modern nuclear reactions, their S_analysis for detect regularities explaining the deterministic nature of nuclear processes and reactions.
5. S_models for the formation of neutron stars and black holes (quasars), physical mechanism of the formation of their jets.
6. Unified vortical theory of field (including gravity).
7. S_Models of Dark Matter and Dark Energy, the calculation of the composition of simples in Dark Matter, the negative electrical charge of Dark Matter.
8. Antimatter in S_theory, the pairing of the birth of the universe and Anti-Universe.

Now we briefly, in the form of enumerations, summarize the main provisions and results of S_theory (ST).

ST Basic Provisions

- the basic idea of ST - simples are formed as a result of stretching virtual photons by an external magnetic field into simples-spirals and folding the latter into simples-bagels;
- the cosmological model of ST - all matter consists of simples which moving from one kind to another;
- Simples have three constructive elements and nine properties (parameters);
- the mass of the simple is determinedto its internal closed magnetic vortex;
- the electric charge of the symple is generated by orthogonally located azimuthal and toroidal electric vortices, the magnitude of the charge of the simples is -1/6 or +1/6 of the charge of the electron, the charge sign is determined by the direction of the coupling between of the electric vortices;
- Simples can not exist separately, the electromagnetic properties of the simples "make" them to be grouped into in the transverse blocks from two bagels (neutrinos) and longitudinal blocks of several simples from which the base particle of matter is formed - the relic neutron (nr). The composition of the relic neutron includes tau neutrinos (60 pcs.), mu-neutrinos (61 pcs.), quark u (4 simples Su+), and two quarks d (2 simples Sd-), the structural features of their assembly into a single toroidal aggregate form three slit magnets that provide the appearance of strong interaction forces;
- the relic neutron can decay into a proton and an electron and can join without interference to join other nucleons, forming nuclei of isotopes (this process is called nr_nucleosynthesis of isotopes);

- from the relic neutron in the process of nr_nucleosynthesis of isotopes, modern protons and neutrons are formed, the mechanism of transformation of relic neutrons into modern nucleons, as well as all other nuclear reactions, consists in the bursting of mu neutrinos (defectons) that are most stressed during nr_nucleosynthesis;
- the idea of mu-neutrino (defecton) bursting explains the mass defect in all nuclear reactions, preserves the "unshakable" law of conservation of mass and energy, and also ensures the unidirectional process of the energy evolution of matter in space and time;
- modern protons and neutrons, as well as α particles, in different isotopes contain a different number of mu-neutrinos remaining as a whole, as a result of which their mass should differ;
- nuclear reactions nr_nucleosynthesis according to S_theory are carried out in accordance with a number of regularities that provide a deterministic result in the formation of isotopes;
- S_models of the structure of nucleons and the process of combining them into nuclei allow simulating the shape of the nuclei of isotopes in the form of "sausages", "bends" and "tangles";
- the construction of the matter of their electromagnetic simples of the 1st, 2nd and 3rd species allows us to deepen the single field theory by introducing into it the physical model (idea) of the formation of field lines in the form of chains (flagella) of virtual photons (VP) and gluons;
- the hysteresis of the duration of the pulses of attraction and repulsion of the flagellum VP during the interaction of electric and magnetic charges of neutral bodies allows us to construct a purely electromagnetic model of gravitational interaction without using the hypothesis of gravitons;
- a certain composition of relic neutron simples explains the limited amount of ionic matter in comparison with the total mass of matter in the Universe (simples of the required kind have ended for the further formation of matter). The remaining simples form particles of Dark matter, wherein Dark matter adsorbs a small excess of negative symbols and acquires a negative charge. This charge of Dark Matter leads to the dispersal of the Universe, which is interpreted as Dark Energy;
- the complete S_model of the birth of the universe has a symmetrical component in the form of simultaneous formation of Anti-Universe, consisting of antimatter. The universe and Anti-Universe at birth have received impulses in opposite directions and are run up from each other.

Elements of simples

- Internal magnetic vortex;
- toroidal (cylindrical) electric vortices;
- azimuth electric vortex;

Properties of simples

- form - torus, arc-shaped cylinder;
- mass (energy);
- density;
- electric charge;
- magnetic moment;
- spin ("mechanical moment");
- elasticity (critical radius of inflection);
- stability (bagels - stable, spirals - not stable);
- the spectrum of the resonance lengths of the simples (Su, Sd, Se, Sμ, Sτ).

Constructive options for constructing elementary particles from simples

- pairwise union of two simples-bagels with the opposite charge (neutrino, electron-positron pairs);
- longitudinal union of the simples-spirales to blocks (quarks u and d);
- longitudinal union of the simples-spiral to blocks with subsequent folding into a bagel (electron, positron);

- electromagnetic assembly of tau-neutrino, mu-neutrino and quark blocks into torus aggregates (relic neutrons).

S_model of nucleons

- S_model of nucleons realizes the idea of "weights of different masses" and consists of the following symbol blocks: 60 tau-neutrinos, from 61 (nr) to 9 (in 56Fe isotope) mu-neutrinos, 3 quarks (longitudinal blocks of simples-spirals 120°);
- three slit magnets formed by three azimuthal vortices of three quarks and being "sources" of forces of strong interaction of nucleons;
- an internal magnetic vortex of the toroidal aggregate of nucleon, formed by superposition of the magnetic moments of the tau- and mu-neutrinos, generating the external dipole moment of the nucleon.

The calculation of parameters of simples

- Comparison of masses, charges, and S_models of their structures main nucleons (relic neutron, reference proton - nucleus 1H, reference neutron from 2H nucleus), and S_models of processes their mutual transformation, allowed to calculate the main parameters of simples (mass, charge, size).
- The calculated parameters of the simples allowed us to carry out the S_modeling of the process of nr_nucleosynthesis of the isotope spectrum, of modern nuclear reactions, to determine their regularities (clamps, waves, mountains , stairs, ravines, etc.) and construct theoretical models of these processes.

The cosmological concept of S_theory (seven Cosmological stages)

- <u>Stage 1</u>: the birth (stretching) of simples-spirales;
- <u>Stage 2:</u> quantization (dropping of gluons, shortening of simples-spirales) of the lengths of simples-spirales (up to resonance lengths), convolution of long simples-spirales (Sμ, Sτ) into bagels, formation of simple-gluon plasma;
- <u>Stage 3:</u> formation of tau-neutrinos, mu-neutrinos, electron-neutrinos, blocks of short simples-spirales, annihilation parts of simples-spirales not included in the blocks, formation simple-gluon-neutrinos plasma;
- <u>Stage 4:</u> the first stage of nr_nucleosynthesis is the formation of relic neutrons, the separation of matter into substance and Dark matter;
- <u>Stage 5:</u> the second stage of nr_nucleosynthesis - the beginning of the decay of relic neutrons into protons and electrons;
- <u>Stage 6:</u> the third stage of nr_nucleosynthesis - nr_nucleosynthesis of the complete isotope spectrum, which ends with the end of the relic neutron stock;
- <u>Stage 7:</u> the conglomeration of matter, the formation of galaxies, stars, planets, neutron stars and black holes (the stage of evolution of matter, goes to the present time).

Note: The main difference between the ST cosmological concept is the absence of a stage of mass annihilation of baryons.

Peculiarities of nr-nucleosynthesis of the isotope spectrum

- <u>Postulate No. 6 (mass defect):</u> The process of nr_nucleosynthesis is a sequential assembly of "sausages" of isotope nuclei from torus-like aggregates of relic neutrons with their transformation into modern nucleons (protons and neutrons). The mass defect in all nuclear reactions (including nr_nucleosynthesis) is negative and is caused by the mu-neutrino bursting process, which are part of the nucleons. From busted mu-neutrino are formed other particles (new gluons, electrons, positrons, gluons, gamma quanta, electron-neutrinos). The significant part of the gluons remain inside the nucleus, forming gluon flagellums, playing the role of "working body" for interaction and attraction of slotted magnets.
- <u>Postulate No. 7 (confinement):</u> In the process of nuclear reactions, quarks (one or two) may collapse; when a single quark is destroyed, a quark of the opposite kind is formed from the simples of the bursting mu-neutrinos.

In the case of two quarks is destroyed, always collapse quarks of the same kind, and two quarks of the different kind always form in their place. This rule is explained by the balance of the simples in these processes.

- postulate No. 8 (form of nuclei): "sausages" of nuclei always grow in one direction; the conjugation of nucleons of different types leads to their no-coaxial connection; As a result, the "sausages" of the nuclei are twisted into "bend" and "tangles".

- Corollary 1 of postulate No. 6: the process of mu-neutrino bursting in nucleons in the course of nuclear reactions is irreversible, which determines the irreversibility of processes within the framework of of the second law of thermodynamics; This irreversibility is the basis (physical meaning) of the physical parameter - time, and explains its one-pointedness.
- Corollary 2 from postulate No. 6: the number of remaining mu-neutrinos in each nucleons decreases continuously during the sequence of nuclear reactions, as a result, the mass of these nucleons also decreases; in other words - the mass of protons and neutrons is not constant, the mass of α particles is also variable.
- Corollary 3: The construction of a theoretical model of the process of nr_nucleosynthesis based on the calculated parameters of simples and revealed regularities allows us to infer the probabilistic nature (within certain limits) of the number of bursting and remaining mu-neutrinos in isotope nuclei and possible small differences in the masses of identical isotopes.
- Corollary 4: The performed calculations have confirmed the "operability" of the adopted S-model of nucleons, constructed on the use of tau- and mu-neutrinos as "main weights" for the formation of nucleons.
- Corollary 5: The obtained results of the S_model of the reactions of nr_nucleosynthesis are in good agreement with the known theoretical and experimental data, in particular the graphs of the binding energy of nucleons in the nucleus.

S_modeling of modern nuclear reactions

- S_models and S_formulas of the following nuclear reactions were compiled: β-_ecay, β+_decay, K_capture, α_decay, p_decay, n_decay, decay of isotope nuclei, thermonuclear fusion reactions;
- The results of S_modeling of these reactions, taking into account the revealed regularities and consequences, in the overwhelming number of isotopes completely coincide with the known theoretical and experimental data;
- At the same time, some inconsistencies in the results of S_modeling and experimental data were revealed, explanations for these discrepancies were proposed; certain discrepancies are of the nature of contradictions, in our opinion, the elimination of these contradictions must be due to the refinement of the masses of individual isotopes, in particular, the isotope 3H.
- We separately attempted to construct S_models of the processes of formation of neutron stars and black holes. These models are consistent with the available observational data of astrophysics.

S_theory of field

- the main distinguishing feature of S_theory of the field is the S_model of the transfer of electromagnetic interactions through the flagellums of virtual photons and gluons;
- a detailed analysis of the processes of formation, interaction and bursting of flagellums VP allows us to conclude that hysteresis is present in the duration of the impulses of attraction and repulsion of the unipolar and unipolar flagellums of the VP; applied to the interaction of charges of neutral bodies, this model makes it possible to explain the occurrence of gravitational attraction forces between them, as an unbalanced excess of electromagnetic forces of attraction above repulsive forces.

S_Models of Dark Matter and Dark Energy

- at the stage of formation of relic neutrons there is a separation of matter into substance and Dark matter; in the composition of Dark Matter remain the simples and blocks of simples that are not involved in the formation of relic neutrons and not burn out in the furnace of annihilation ;
- the proposed S-model of the distribution of simples have many of variants; the analysis of the made variants of calculations allows to draw an unambiguous conclusion about the presence in the Dark matter of a non-balanced negative electric charge;
- an unbalanced electric charge concentrates in the halo of galaxies, which leads to their accelerated dispersal, and it is customary to interpret it as Dark Energy.

Antimatter in S_theory

- S_theory gives an unambiguous answer about the formation of an absolutely identical quantity of matter and antimatter in the form of two symmetrical separated Universes (from two opposite sides of the BBH), which, moreover, have opposite non-compensated electric charges; the latter circumstance may lead to the subsequent movement of the Universes towards each other. When they meet, part of matter and antimatter are annihilated, but part is formed into a super large black hole that can explode later (BBH) and spawn a new pair of universes (the idea of pulsating universes).

Anthropic principle in S_theory (three-level)

- The third level: the energy balance of the universe ("rook"), as well as a set of chemical and biochemical properties of isotopes and their compounds, is determined by the physical parameters of the spectrum of isotope nuclei, such as their mass, charge and the ratio of protons and neutrons in the "sausage" of nuclei .
- Second level: the formation of the spectrum of isotopes with these nuclear and chemical properties is a deterministic process, determined by a number of regularities.
- The first level: S_model of Universe formation, due to the constancy of the parameters of virtual photons and the phenomenologically assumed constancy of the critical mass of the bursting super-large black holes, as well as the determinionic processes of distribution of the simples over the length spectrum in the process of their formation, and subsequent formation of the isotope spectrum, allow to draw a conclusion about the identity of all formed Universess.

  Note: In this hierarchy of the Anthropic Principle, there is no Zero level, what its content is, so far we do not know.

List of main differences between SM and ST and their explanation

- The discrepancy between the quark masses u and d (due to different nuclear models).
- The variable mass of protons, neutrons, α-particles and the probabilistic nature of a small difference in the masses of identical isotopes (due to the idea of mu-neutrino bursting during all nuclear reactions).
- Equality of the sizes of reference p and n in ST, and in SM they differ, (due to imperfection of the measurement technique).
- Difference in the size of an electron (different electron models in SM and ST).
- Different quantity (νe + γ) in the nuclear reactions by SM and ST (necessity of revision of the lepton charge conservation law).
- According to ST in gas clouds (as the remainder of primary nr_nucleosynthesis), heavy elements (the entire Mendeleyev table) should be observed, in SM - heavy elements are synthesized in stars (first generation) and in gas clouds should not be present. (An additional experimental check is required.)
- The mass of tritium (3H) by ST must be on 3 pcs. mu-neutrino is heavier than reference mass for SM, i.e. According to ST, it should be 3.0166477657 aem, instead of reference mass 3H equal to 3.0160492777 aem. (An additional experimental check is required.)

The list of necessary additional theoretical studies and experiments for testing S_theory

- Development of the theory of electromagnetic vortices.
- Experimental verification of the physical model of the formation of simples.
- Experimental verification of the S-model of ball lightning formation.
- Experimental verification of S_models of mass formation and electric charge.
- Additional check (revision) of data base of the nuclear reactions and reactions on accelerators and other installations to the corresponding the experimental results of the this reactions to S-models of S_theory.
- Search for heavy elements (the entire periodic table) in gas clouds (the remains of primary nr_nucleosynthesis).
- Experimental verification of the mass of α particles emitted from heavy isotopes, their mass should be less to the mass of the reference α particle (He4 core).
- Experimental verification of the S-model of the difference in mass of protons and neutrons in different isotopes.
- Experimental verification of the mass of the isotope 3H.
- Revision and experimental verification of the lepton charge conservation law.
- etc. (see the text of the work).

A little dream (possible practical results of ST)

New energy carriers

S_theory gave us an explanation of where the energy of all nuclear reactions comes from - this is the energy of the internal magnetic vortices of the bursting simples (mostly mu-neutrinos, and to a lesser extent quarks), injected into them by SPMF (BBH) at the time of formed simples from virtual photons.

But we now "know" that the simple-bagels of mu-neutrino are not the largest "storehouses" of energy of the SPMF (BBH) in any nuclear fuel sample. The larger "repositories" are the simple-bagels of tau-neutrinos.

Theoretically, the task (# 1) is to find the approaches and to disembowel the bagels of tau-neutrinos and to get of their internal energy.

Practical implementation of this task requires very large theoretical and experimental studies.

New propulsors

The new explanation offered by S_theory of the emergence of additional attractive forces in the Casimir effect suggests a potential possibility of screening the action of flagellums VP.

The task arises (# 2) - to learn how to artificially asynchronously made screening the work of flagellums VP in different directions. This will enable the construction of new propulsors on a fundamentally new basis.

Risks of S_theory

- An additional analysis of the probability of BH generation is necessary in experiments with powerful electromagnetic vortices (the formation the simples of the third kind).
- Possible use of ST in special developments.

What's next?

This concludes our presentation of S_theory. Chronologically, the beginning of her "work" is at the beginning of the process of stretching virtual photons into simples under influence a short-term powerful magnetic field from the bursting Black Hole (BBH).

The question arises, and where and how do virtual photons appear, and where did the first burst Black Hole come from?

These questions go beyond S_theory, they relate to the physics of space, we will analyze them in the final chapter of our work entitled "Fourth Physics".

Conclusion of chapter 14

S_theory proposed a set of interrelated physical models built on a single conceptual basis of the interaction of electric and magnetic vortices, and explaining all the known processes of the emergence and evolution of the material world (the Universe) at the nuclear and subnuclear levels.

A number of propositions and conclusions (corollaries) of S_theory differ from the known theoretical approaches and reference data of classical physics. These discrepancies require additional experimental verification, which at the same time will also test S_theory.

Chapter 15. The Fourth Physics (Physics of Space)

Historical reference

The team of authors of this work was formed naturally.

Chibisov V.F. (CHV), a native of the fifties and sixties, was always interested in the latest achievements of physics. After graduating from the radio engineering department of NETI (NSTU) for many years, he worked as a designer of microminiature microwave devices, and this experience was very useful when writing this work.

Chibisov I.V. (CHI), he graduated from the physics and mathematics school at Novosibirsk State University, two universities (NSU + RES), and despite his specialization in economics, he could not stay away from discussing the problematic issues of this work (initially), which eventually resulted in Compilation of mathematical models and huge computational work on checking the consequences of S_theory and linking its individual provisions to a single consistent model.

But the work had one more co-author, a classmate of CHV in the alma-mater, Vtorushin V.U. (VVU). Possessing remarkable analytical abilities and imaginative thinking, he was also always interested in physics. And he was not just interested, but constantly stated his views in various publications. One of his works, directly related to the physics of space, was called "Spatial-temporal calculus" [24].

We constantly discussed with him his experience, argued, tried to find common ground and intersection with known physical theories, all this certainly developed our physical thought and went to us together for use.

Five years ago, CHV gave VVU a friendly physical opus on its birthday, in which he proposed to "modify" the string theory, replacing in it abstract mathematical strings to space-time corpuscles (STCor), in which a certain resonant oscillatory process was flowed - it is cycles of space-time calculus (STCal) proposed by VVU in its work [24]. Different resonant modes in these corpuscles could be interpreted as different elementary particles. True, for this, it was necessary to quantize its space-time continuum (STCon) at corpuscles (STCor).

Unfortunately, VVU "rejected" this idea, explaining that the STCon is globally, continuously and "quantized" on corpuscles is not subject.

But, the idea of corpuscular micro cavities was "stuck" in the head of CHV and he had to "grow" it alone. As a result of months of "torment", the CHV came (phenomenologically) to the conclusion that virtual photons "stretched" into spirals by a powerful magnetic field can form in the role of data of corpuscular micro cavities, resulting in the formation of Simples (S).

To test this idea, we had to analyze the physical properties of the Simples formed in this way, build models for the formation of elementary particles from simples, calculate the parameters of simples, etc., etc., in general, build an entire S_theory. At a certain stage, for performing large-scale computational work, CHI was attracted to the work, making an invaluable contribution to the calculations and "matching" of individual elements of "designs" of elementary particles and isotope nuclei formed from simples, and all this is associated with S_models of various nuclear and subnuclear processes .

An even greater amount of computation was be done when checking the consequences arising from S_theory, namely S_modeling of the algorithms for the synthesis of nuclei of the isotope cloud and modern nuclear reactions.

As a "free" application to the results of this work, new models of field theory, gravity, dark matter, dark energy, the location of antimatter in the Universe, and much more have surfaced.

So was born S_theory. In fact, it was, as it were, a "by-product" of the initial attempt to consider the formation of elementary particles in space.

And now, five years later, at the end of the construction of the S_theory and the theoretical verification of the consequences arising from it, we are again "forced" to return to the physics of space to answer questions - where and as formed the virtual photons and the first burst Black Hole (BH), from interactions of which are formed simples. Without an answer to these questions, S_theory can not be considered complete.

Numbering of classical physics (chronological).

The term "Fourth Physics" was born on the basis of the chronology of the development of physical science:

The first physics is Newton's classical mechanics (+ thermodynamics, etc.).

The second physics is Maxwell's classical electromagnetic theory (+ optics, etc.).

The third physics is corpuscular theory of elementary particles (+ nuclear physics, quantum theory, Standard model, etc.).

The fourth physics is the physics of space-time (what physicists are working on at the present time). It is this section of physics that we will now consider.

New classification of physics

The above numbering of the physics reflects the chronological order of their appearance. However, all physics have an internal relationship and a hierarchy, based on which they are best placed in the following order:
1. Physics of space.
2. Corpuscular physics (nuclear and subnuclear).
3. Electronic physics (interaction of electron shells of atoms = chemistry).
4. Physics of living matter (biochemistry).
5. Physics of the mind (intellect).

Basic physics objects and "channels" of communication between them

Physics of space: the physical objects considered in this physics are not exactly defined, there are a lot of theories (hypotheses), the most famous of which is string theory.
Corpuscular physics: without undue modesty, we declare that the basic objects of corpuscular physics are simples, in all their manifestations. All other elementary particles consist of simples (S_theory).
Electronic physics (chemistry): the basic objects responsible for chemical reactions are electron shells of atoms (electrons).
Physics of living matter (biochemistry): the basic objects are cells, complex self-reproducing molecular compounds of atoms.
Physics of the mind (intelligence): the basic objects are neurons, special living cells, capable of perceiving, generating and transmitting information.
If the physics of space will be taken out of brackets for now, then it is easy to see that **the basic objects of all physics are of an electromagnetic nature**.

Let's now ask ourselves, what are the "channels" of communication between physicists (?).
According to S_theory, the "transfer link" between the physics of space and corpuscular physics are virtual photons. They are formed in space (from space) and participate in the birth of simples, - the basis of corpuscular physics.
The "transfer link" between corpuscular and electronic physics is the electromagnetic structure of electronic levels (wave function) generated by atomic nuclei.
The "transfer link" between electronic physics and living matter physics is, as a variant, the interference electromagnetic structure formed by the electronic shells of DNC molecules, used as a "template" for the reproduction of analogous DNC molecules from the material of the environment and thus the formation of new living cells. This hypothesis can be found with a number of articles on biochemistry.
The " transfer link" between the physics of living matter and the physics of the mind is the holographic structure generated by a collection of special living cells (brain cells) and the ability of these cells to communicate with the given structure (to adapt to it as an external environment and to extract useful information from it). - One of the hypotheses.
It is easy to see that **all the "channels" of communication between physics are of an electromagnetic nature.**
So, it turned out that the basic objects of four out of five physics and all communication channels between them are of an electromagnetic nature.

The task of determining the nature of objects, of which space consists

Before us is the task to determine the nature of space, from which, according to S_theory, virtual photons should be born.
Initial conditions of the task:
1. One of the initial conditions of the problem is our "statement" ("assumption") that in space (from space) virtual photons should be born.
2. Another "cornerstone" of the physical model of space is a very widespread "assertion" ("assumption") that a "broth" is continuously "brewed" in space.

3. The third necessary condition of the task, in the opinion of many physicists (and we agree with them), is the "statement" ("assumption") that the entire space is quantized, i.e. Consists of "microscopic" spatial corpuscles.

The first initial condition (virtual photons)

This condition is better called, for understandable reasons, not initial, but finite. Someone can say that the birth of virtual photons in space - a private case (in space are a many, many another things are "brewed").
We can not even object to this remark. However, if the validity of S_theory will be confirmed (and we "dance" from this "stove"), then the value of the birth in space of virtual photons can not be overestimated. All that is born in space another "dims" against their background of virtual photons.
What then does this mean?
If virtual photons of electromagnetic nature are the main "product" of space, it is very likely that the very "working mechanism" of space for "generation" of virtual photons also has an electromagnetic or similar nature.
The structure of space (what does the "broth" consist of?)
In all interpretations (models) of space it is considered that it has two components that are inseparably linked together - space and time, physicists even speaking of space, usually use the term "space-time", emphasizing their indissoluble connection.
And in all mathematical formulas describing the processes inside space-time, two arguments are always used, one in units of space and the other in units of time.
The question arises: how do they to "cook" together there, what kind of "broth" is obtained?
We will not refer and analyze a lot of materials on this topic, let's say at once, we personally prefer the variant of "broth" of Vtorushin V.U. - its continuous cyclic process of space-time calculi or space-time rings (ST-rings) in the continuum of space-time. We will not elaborate on the essence of the VVU approach (we are afraid to introduce distortions), we will give only a few quotations from the VVU itself.

"ST-ring (STR) is not a geometric figure. In this case, STR designates a cyclical principle that does not have a beginning and an end in space and time. "
"The space-time ring demonstrates a continuous, nowhere-beginning and nowhere-ending principle of converting S into T. The principle of conversion in STR has an inversion, that is, STR is an inversion ring in which S and T are not easily changed by roles in cause-effect relationships - they change roles with inversion and inverting one's qualities to qualities another. "
"... the manifestation of natural space occurs in the orthogonal correlation with the manifestation of natural time ..."
"The orthogonal correlation of two unconditional manifestations leads to the fact that the system of calculus, reflecting their correlation, must have two points of orthogonal transition: the point of zero space is ZS, and the zero-time point is ZT."

Torn quotes, of course, are not the best way to get acquainted with the new theory, but in this case we need to "push off" from something, and the main thing for us is an internal cyclical process "going" inside the space. Let us analyze the constituent elements of this process. The readers, of course, paid attention to the fact that we persistently use the term "space", departing from the generally accepted term "space-time". This is not accidental. Let's figure out what time is and what space is.

Time

In our opinion, time is not a substantive entity that participates in any physical processes. It is only a "scene" on which all physical processes unfold. In fact, time reflects the sequence and speed of certain events, characterizing the dynamics and duration of the stages of a particular process.
The dynamics and duration of the stages of each process can be graded, as a result, we get, as it were, the local time scale of this process. Moreover, this scale will only apply to this process, displaying its internal local time. The other process has its own internal local time. You can, of course, take some process for the standard, and compare its internal local time with the internal local time of other processes. As a result, we get a clock (as a mechanism), not a global time, as a physical entity.
If we take two "absolutely identical" processes (two twins, two internal combustion engines, etc.), then their internal local time (aging rate, number of internal combustion cycles, etc.) can flow in different ways, depending on the various conditions that affect these two processes. These conditions can be, for example:

- the movement of these two processes at different rates (we recall the "hair" of the "dangling" flagellums of the VP and their different interactions with the environment at different speeds);
- Different temperatures of these processes (the internal speed of the movement of the elements of objects (physical entities) involved in the processes);
- or placing them in different gravitational fields (which will "pull" them differently for the same "hair").

As a result, physicists usually conclude - there is no absolute time!
But it is not so. The first: there is not the Absolute time, the second: no time, as a physical entity.
There is a process. There is the objects of the process (some physical entities). There is stages of the process, during which there are some changes with the objects of the process. There is a sequence of stages inherent in this process. There is the rate of alternation of stages, in comparison with other similar processes or with some reference process, is (local internal time). But there is no time (as a physical entity).
Proceeding from this, we exclude the time from the participants in the cyclic process "spinning" in space (the time as virtual, and as the mathematical participant of cyclic process does not interest us).

Two-component space (2CS)

Unlike time, Absolute space there is (!). This statement may seem unfounded, because according to the theory of relativity, all objects under relativistic conditions change not only the internal time, but also the dimensions.
But here we allow ourselves to fix the difference between the material objects (particles, bodies) consisting of simples, and the space consisting of some physical entities that are not yet known to us.
At this point, we can recall the basic assumptions of the field theory (flagellum of virtual photons) explaining the mechanism of relativistic changes occurring with material objects. With this in mind, we can say that relativistic mechanisms operate only on material objects and do not in any way affect the substances (physical entities) of which space consists.
The reader has the right to say, "Okay, let's say, Absolute space there is. But there is no Absolute time, that they themselves claimed. From what, then "broth is brewed" (a cyclic process), one component (space) is not enough for this. Any process, even an immovable body, necessarily contains the second component, with respect to which the given body is motionless (!). "
Yes, we also were puzzled on this issue and for quite some time "broke his head over him." As a result, we came to the conclusion that our space is two-component, i.e. consists of two components. We call these components conditionally C1 and C2. What are these components we do not know yet, let's try to simulate them.

The physical nature of the components C1 and C2

__Historical reference__

About, two or three years ago, CHV "jokingly" proposed the VVU - "And what if to go the" terminological "way: call the component C1 a vortex E (electric vortex), and call the component C2 a vortex H (magnetic a vortex). We then laughed at this proposal together, but noting that it may be possible that a certain genealogical relationship can exist between them.

As they say, every joke has a hint, for a good fellow, a lesson.
And now, after these two or three years, after we conceptually succeeded in reducing all objects and all processes of the universe to electromagnetic models, we are absolutely sure that the components of C1 and C2 of the two-component space have a genealogically related nature with electric and magnetic vortices.
It is known that the interstellar space (vacuum) has quite definite electric and magnetic parameters (εo, μo). In our opinion, this indirectly indicates the electromagnetic nature of components C1 and C2.

Phenomenological model of a two-component space

To imagine what a two-component space is, it is necessary to "push off" from something. We take the space-time continuum of the VVU. His model is also two-component, and between these components there is a continuous, infinite cyclic process of space-time calculus (STCal). However, honestly I admit, I (CHV) never fully imagined this process physically. How does this time (T) go into space (S) and vice versa? And what are the points of the zero transition of ZS and ZT, where are they located and can we talk about some distance between them?
But if in the cyclic process of the VVU to replace the components of S and T by the components C1 and C2 and apply to them the known mathematical apparatus of the cyclical transition of the vortices E and H inside virtual photons, then everything falls into place.

Then zero point (ZP1) is the central point of the vortex C1, in which the orthogonal vortex C2 is generated, and (ZP2) is the central point of the vortex C2, in which the orthogonal vortex C1 is generated.
Next, we need to determine the scale of our cyclic process, or rather with the size of the vortices C1 and C2. And here we can not do without quantizing the space. But first we'll think about how the two-component space was formed.

Variants of origin of the two-component space (insert of 10/20/2017)

To answer the question - how the two-component space was formed, we have too little data on the structure and processes occurring in space. Having no special arguments, we can assume three variants of the formation of a two-component space.
1 variant (natural): A two-component space existed, exists and will exist forever, it has no beginning, no end.
2 variant (in something exotic): A two-component space is the result of a collision and penetration into each other of two "simple" one-component spaces S1 and S2 (two "tectonic plates"). In this case, a kind of "space-shaking" takes place, as a result of which waves (to the likeness gravitational ones) are formed, which "twist" the spaces S1 and S2 into the vortices C1 and C2. As a result, a two-component space (2CS) is formed, consisting of corpuscles (C2CS), in each of which go the cyclic process of mutual transition of vortices C1 and C2 is rotating into each other.
3 variant (supernatural): Anthropic principle. In the Bible it sounds like this: "In the beginning God created the sky", ie, space.
We can not from the scientific point of view give preference and justify this or that option. This issue requires a very large, long and painful study.
Without any other arguments, we take the second variant as the working one for modeling the quantization of a two-component space.

Quantization of space

Let us return once more to the Absolute Space. Five minutes ago we claimed that it exists. And now we want to take our words back and say that there is no Absolute Space (!).
Have gone crazy, nothing else readers can not think.
Do not rush with the "diagnosis". We mean that there is no Absolute space, as global, infinite, single and indivisible. In fact, we think that there are not many physicists with super imagination who can imagine a physical model of a single and indivisible cyclic process spanning a global infinite space, consisting of only two components. What is the size of the vortices C1 and C2?
More realistic is the "inverse" physical model of space, according to which it consists of "microscopic" corpuscles, in each of which a cyclical process of mutual transformation of vortices C1 and C2 takes place. The dimensions of such spatial corpuscles should probably be of the order of Planckian dimensions, and smaller objects should not exist. The totality of all spatial corpuscles also forms that single, global, infinite Absolute space, but not indivisible.
How did these spatial corpuscles form? As an analogue, a picture of the interference of two synchronous waves (components C1 and C2) can be proposed. In the antinodes of this interference pattern standing waves are formed, in which the components C1 and C2 are twisted relative to each other. Some spatial corpuscles form within which a cyclic process of mutual transformation of vortices C1 and C2 into each other is formed. These corpuscles are not connected by any medium and begin to "live an autonomous life".
The cyclic process of the transformation of components (vortices) C1 into C2 and back is mathematically equivalent to the transformation of components (vortices) E and H in a virtual photon. The planes of the vortices C1 and C2 are constantly rotate relative to each other, remaining orthogonal to each other at any stage of the cycle. As a result, the orientation of the planes of the vortices C1 and C2 in different corpuscles becomes arbitrary, which gives zero sums of the vortex vectors C1 and C2 in any direction in any region of space.
It should be borne in mind that in each corpuscle, its internal local time "flows", reflecting the cyclical process going on in this corpuscle. However, considering that all these corpuscles are almost identical to each other (like the smallest objects), the internal time in them "flowing" is practically identical. If the internal time in one a corpuscle is "taken as a standard," then it will practically be a pseudo-Absolute time for a very large region of space.
Such a model of a two-component quantized space realizes the last initial condition of task, that we solve, and contains all the elements necessary for the birth of virtual photons in space.

The birth of virtual photons in a two-component space

The creation of virtual photons in a two-component space (2CS) consisting of corpuscles (C2CS), in each of which two orthogonal components C1 and C2 "twist", the genealogically identical vortices E and H, are only a matter of time (pseudo-Absolute) because The technique (theory) of this process is well developed and is called the theory of superwaves.
According to this theory, the continuous displacement (rotation) of the planes of the vortices C1 and C2 relative to each other will inevitably ever lead to the coincidence of the orientation vectors of simultaneously produced vortices C1 or C2 in a number of neighboring corpuscles in some "noticeable" region of space. As a result of their vector, are summarized and "standard" vortexs C1 or C2 will not be born, but there will be born the "supervortex" C1 (E) or C2 (H), which will generate the opposite "supervortex", etc. - A virtual photon was born. What was required to receive.

Formation of the first black hole (BBH)

The physics of the formation of the first BBH is an intermediate section of physics between the Fourth Physics (physics of space) and S_theory.
The solution of the question posed consists of a whole series of events (processes).
At the first stage virtual photons are born (as we have already described). We remind you that virtual photons do not have a pulse and represent some number of cycles of the transition of the electric vortex into an orthogonal magnetic vortex, and the last into an orthogonal electric vortex, etc.
At the second stage, there is a fluctuation, when at the same time, practically at one "point" (an elementary region of space, not to be confused with the corpuscle of space), simultaneously two virtual photons are generated orthogonally oriented with respect to each other - two intersecting electric vortices connected by a drill rule see Figure 15_1). This "construction" is identical to the reverse simples (halves) of electronic neutrinos (see Chapter 2).

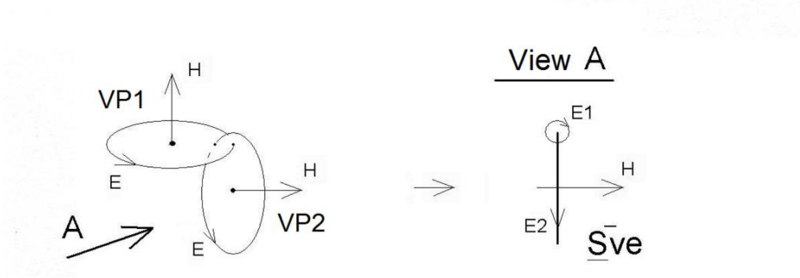


Fig. 15_1. Fluctuation - the birth of two related orthogonal virtual a photon in one region space and converting them into halves of electronic neutrinos

The third stage: The direction of communication of electric vortices of virtual photons (the kind of a borer) will determine the form of the charge of the formed half of the electron-neutrino. Two such halves with different electric charges, having joined, form an electron-neutrino.
Fourth stage: The "mechanism" of oscillation begins to work-a consecutive connection to each other, into a single unit, donuts of electronic neutrinos, under the influence of their magnetic moments. In the resulting block, individual halves of the electron-neutrino can also be "mixed"; They also have magnetic moments. But only the electric charges of these halves should be successively alternating (... "+", "-", "+" ,"-" ,"+", "-" ... etc.), so that no forces of electrostatic repulsion arise (see Figure 15_2). In any state of the block formation process, the asymmetry of the number of positive and negative halves of electronic neutrinos may be. +/- 1 pcs. In one direction or another.

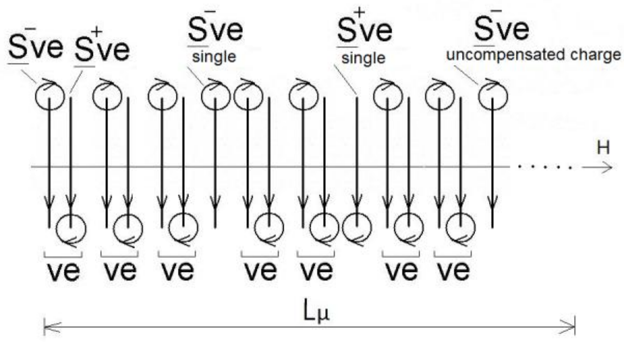


Fig. 15_2. Oscillation of electronic-neutrinos and their "halves"

Fifth stage: After reaching the block length equal to sufficient the length, the block is folded into a bagel. And here the actual question becomes which halves of electronic neutrinos (with what charge) in the resulting bagel turned out to be more, positive or negative, namely such a total azimuthal electric vortex is formed in a bagel and it is this charge that by the primary simples (S_1^- or S_1^+) will receive. The index "1" in the simples designation means that we are talking about primary simples formed by the oscillation method, and not about "standard" simples formed by the method of stretching virtual photons by a magnetic field.

When the charges of positive and negative halves are equal, a primary simple with zero charge is formed, without an azimuthal electric vortex, and without a magnetic moment (S_1^o), Zeldovich's peculiar anapoles. Such "zero" simples are "incompetent" from the point of view of S_theory, because can not establish electromagnetic (and, consequently, gravitational) connections. In the further stages they do not take part. It is not possible to trace their future destiny.

Special attention should be paid to the length of the simples formed. The external conditions (the temperature of the space before the formation of the universe) are close to absolute zero (only cyclical processes of mutual transformation of the vortices C1 and C2 in the corpuscles of space, are go). Accordingly, the value of the coefficient of flexibility of the simples (the minimum length at which they are rolled into bagels) at this Cosmological stage is greater than 150, corresponding to the formation of bagels of electrons. Even the resonant length of the tau-simples equal to 2275d can also be less than critical, for folding the resulting simples into bagels at a given temperature. At the present time, we can not determine the length of these simples, but it is clear that it can not be infinite and they should eventually folding into bagels.

The sixth stage (conglomeration): The simple-bagels with opposite charges (S1- and S1 +) form pairs and form stable toroidal particles with a magnetic moment. Under the action of these magnetic moments they can be assembled into blocks. It is possible that with sufficient length of these blocks, they can be folded into torus-like bagels. Possessing azimuthal electric vortices and magnetic moments, all these blocks and aggregates will establish electromagnetic and gravitational bonds among themselves and will be conglomerated into larger formations. Sooner or later this process will lead to the formation of the Black Hole.

Seventh stage: Because the described process is continuous and infinite, then the growing Black Hole will sooner or later turn into an extra large Black hole, exceed the critical mass and burst, turning into the 1st burst Black Hole, which starts the process of stretching virtual photons, the creation of simples and the formation of the Universe (see chapters 1-14).
That's what we needed to get!

Recollection about the time

This chapter was "conceived" by us almost immediately after the birth of the idea of the formation of simples from virtual photons under the influence of a powerful magnetic field. The images of simples-spirales and simple-bagels phenomenologically (in our heads), as in a "chain reaction", triggered the process of synthesis and

evolution of matter (which ultimately resulted in the creation of S_theory). And then, the main question became, but from where did the virtual photons come from?
This question "tortured" us for 2-3 years, while in the middle of the work, we "could not stand it" and have begun to address it question. The results of this "decision" we just presented to you. We consider its main result to be the creation of the concept of a two-component space without of the components of time as one of the physical entities. This "decision" brought "calmness" to our souls and we safely completed the analysis of all the components and consequences of the S_theory to the end.
And of course, as happened more than once during our work, with the next dive into the informational "ocean" of physical news, we met a post with an similar idea of scientists from the research center Bistra in Ptyu, Slovenia, who advanced the theory that the Newtonian idea of time as an absolute measure that moves by itself, and also that time is the fourth dimension - are wrong. They proposed to replace these concepts of time with a new look that better relates to the physical world: time is just a numerological order of physical changes [25].
This post confirms the correctness of our "decision" to exclude time, as one of the components of the cyclic process going in the corpuscles of space, and logically leads to the idea of a two-component space, because any process, incl. and cyclic, can only occur in the relative variation of one component with respect to the other component.

Corpuscular-vortex model of the VP stretching process into simples in a two-component space (insert as of 11/17/2017)

We were proud of of our main idea - stretching virtual photons into spirals in a powerful magnetic field. It seemed to us perfect and natural. After all, like most classical physicists we lived for many years in the paradigm of classical electrodynamics and electromagnetic fields, their properties, laws, parameters, wave functions, energy wells and maxima, and the photon was for us a quantum of the electromagnetic field, through which electromagnetic interaction are transmitted (this is already went quantum physics, which we also studied). Therefore, the idea of stretching a "swirling" electric vortex in a magnetic field in a simple-spiral was natural for us. Interestingly, with this certainty, we "lived" for five years and "gave to the mountain" a whole S_theory of the formation and evolution of the universe. And only now, when deciding the question - from where do virtual photons come, we suddenly realized the "absurdity" of our main idea.
What's the matter, you ask? The fact is that having translating all matter into simples consisting of electric and magnetic vortices, we could not help but touch upon the issue of electromagnetic interaction of objects consisting of simples. And this, in turn, required answering the question - how is electromagnetic interaction transmitted in this "vortex world"? We had to decide that the intermediaries in the transfer of electromagnetic interaction are also vortices, which, as is well known, have the properties of micro magnets and micro dipoles. The names of these vortices were well known to us - they are photons and gluons. It only remained to understand that photons are of two kinds (virtual and real), and we have a global picture of the world, which consists of electric and magnetic vortices (first-kind simples) and interacts through second-kind simples, also consisting of electric and magnetic vortices. But only in this picture there is no place for a "magnetic field", its place is occupied by flagellums of virtual photons. And now imagine that a powerful magnetic field escaping from a burst Black Hole represents, according to S_theory, a "river" of virtual photons, and in their way are meet up with exactly the same virtual photons born in a two-component space, and one virtual photons should stretch other, exactly the same virtual photons, in simples-spirales (!). The exclamation mark here means that this model is very bad.
Position (and S_theory) are saves thanks to C2CS corpuscles, which have the same genealogical properties as VP. Among them there are micro dipoles (C2CS -MD) and micro magnets (C2CS -MM), so that the whole concept and all S-models of objects and processes of S_theory remain unchanged. In them only the concepts of the flagellums VP and flagellums of gluons introduced by us are replaced by a new concept - chains (flagella) of corpuscles of a two-component space (C2CS). In this case the virtual photons themselves do not disappear anywhere. They are replaced by C2CS in the Unified vortex field theory, but they are objectively born (as a super wave C2CS) and are present in space (they are fixed in experiments), and their role in this quality is indispensable - they are "embryos", which are stretched into simple-spirales by a powerful stream (vortex) of corpuscular micro magnets (C2CS-MM), from the bursted primary black hole.

Supplement to the Fundamentals of the Theory of Electromagnetic Vortices (Adjustment of the Unified Vortex Field Theory), (insert as of 11/17/2017)

Point 17: Carriers of the electromagnetic interaction are chains (flagella) of corpuscles of a two-component space (C2CS). The dimensions of these corpuscles are close to the Planck size. In all the previous points of TEMV (see Chapter 1) and Unified vortex field theory (Chapter 11), the notions of flagellums VP and gluons should be replaced by the notion of a chain (flagella) of C2CS. In this case, the elementary particles the gluons and graviton may be excluded from the list of elementary particles of the Standard Model. The elementary particles the photons in the Standard model should be divided into two types: 1) virtual photons, which are born in space as a super wave of C2CS-corpuscles and are "embryos" in the formation of simples; 2) real photons that are generated as a result of the "release" of surplus energy by excited torus-shaped blocks of simples, or in the processes of breaking down simples.

Corpuscular-vortex model of the RP and VP in two-component space (insert as of 11/17/2017)

A physical model of real photons (RP) deserves special consideration, which we cited above in the first chapter (see Fig. 1_7, 1_8.). It introduced one "non-standard" element, which is absent in classical electrodynamics - we assumed that the vortices of real photons have the shape of ellipses. This model quite clearly reflects the dynamic nature of real photons, the presence of their momentum and their propagation in a certain direction. But the question is unclear, under the influence of what forces the round electric and magnetic vortices of real photons are transformed into ellipses, and is this form of vortexes real or virtual?

There is also a whole series of questions to the physical model of the RP, for example: why the vortex breaking out of the simple does not become a new simple but forms the RP, what is the topology of the inter conversion of the RP vortexes, how the RP pulse is formed and how it is transferred from the vortex to the vortex, RP, the relationship between the size of the vortices and the frequency and energy of the RP, etc. Let's try to answer these questions.

But first, let's ask ourselves one more question: is it necessary to do all this (?), Because there is a theory of classical Maxwell electrodynamics and the theory of quantum electrodynamics, do not they answer these questions? They Answer, but phenomenologically, without considering the structure and processes occurring within the RP. Quantum electrodynamics considers the RP as a point particle and calculates the probability of its being at a particular point at a given time. The classical Maxwell electrodynamics represents a photon as an electromagnetic wave (EMW) and calculates the tensions of the electric and magnetic components of the EMW at a particular point at different times. We, want to disassemble the process of education and movement of the RP at the level of processes occurring with its electric and magnetic vortices.

We already "know" how the real photons is born - a simple-bagel (for example, an electron) under the influence of precession, which arose under the influence of excitation (energy absorption), temporarily bursts and emits a "curl" of the internal magnetic vortex of the simple and then "slams" again , returning to the normal level of energy. The emitted "curl" of the internal magnetic vortex of the simple also "slams", forming a new magnetic vortex. Immediately inside it is formed a bound electric vortex that generates the next magnetic vortex, etc. (a real photon was born), see Fig. 1_8.

Corpuscular-vortex model of vortex formation in the real photon:

According to S_theory, all matter consists of simples. Simples are formed by electric and magnetic vortices. We still did not ask ourselves - what are vortexes? Now we have an answer to this question. Vortices are chains of C2CS corpuscles of two types C2CS -MD and C2CS -MM. We guess that C2CS have Planckian dimensions and are located relative to each other at a distance of interference antinodes, once formed during the formation of a two-component space, and having a much larger value than Planckian dimensions. As a result, 2CS , consisting of C2CS , acquires the property of a superfluid liquid.

We pay attention, that simples are closed or open. We guess that the vortices of closed simples are "frozen" chains of C2CS ("frozen" vortices). They form and generate secondary vortices at the "same" place. When moving objects consisting of closed simples in a two-component space, the bulk of the corpuscles of the space "filtering" between the simples forming the object. The same C2CS, which come across in the way of simples, move apart without any effort and without rendering any resistance to the movement of the object. The lack of effort to move apart the C2CS is due to the different directions of the C2CS vectors and the lack of interaction between them. The momentum of a moving object consisting of closed simples is equal to the product of the mass by the speed of the object.

But the vortices of open simples are the "live" chains of C2CS. They are formed for each vortex "personally", by turning C2CS in the surrounding space under the influence of the introduced electric or magnetic moment and constructing the chain C2CS forming this vortex. The real photons considered by us also belong to the open simples. All RP-vortices are formed from the C2CS chains directly at the time of their formation, and then, transferring energy to the next C2CS chain of the next vortex. After this the C2CS chains of the previous vortex "fall apart" (their C2CS components change their orientation to an arbitrary one). Those. "motion" of the RP is in fact a consistent formation of RP-vortexes (circular C2CS chains) in the surrounding space. In this case, each circular chain C2CS "stands" in space "in place", and the sequential formation of such round chains C2CS "simulates" the "flight" of a real photon in space.

Here a new question arises - under the influence of what physical parameters of the RP the next chain of C2CS is formed and what determines its "thickness" and the radius of twisting. This parameter can only be the energy of the real photon. It determines what "thickness" (from how many chains C2CS) is form a vortex of the RP and with which radius it will twist (the higher the energy of the RP, the more chains C2CS in the vortex (the "thicker" the vortex) and the smaller the radius of the vortex). Let us explain the inverse dependence of the radius of the RP-vortex on its energy. The energy of the RP is determined by the "thickness" of the magnetic field flew from the simple. According to the "old" (field) terminology, this, figuratively, is the number of field lines of force. According to the "new" (corpuscular-vortex) terminology, this is the number of chains C2CS , of which the curl consists. The more C2CS chains in the curl, the more attracted its ends and the faster it slams, i.e. will have a smaller radius. This process can also be described in another way: the smaller the gap in the simple, the more thin and longer the curl is blown out of the simple; The larger the gap in the simple, the thicker and shorter the curl is blown out of the simple. The shorter curls form vortices (chains C2CS) of smaller diameter, which corresponds to a shorter wavelength and a larger RP frequency (in field terminology).

Speed of distribution of the real photon:

It follows from the described vortex model of the real photon that the formation and motion of the real photon are inextricably linked with the corpuscles of a two-component space. This circumstance, in our opinion, is determines the that the fact that the speed of the RP propagation in space (vacuum) does not depend on the frequency of the RP and is the same for all manipulations with the RP source. Let's check it geometrically. In Fig. 15_3. the vortices of two RPs are shown with a frequency that is two times different.

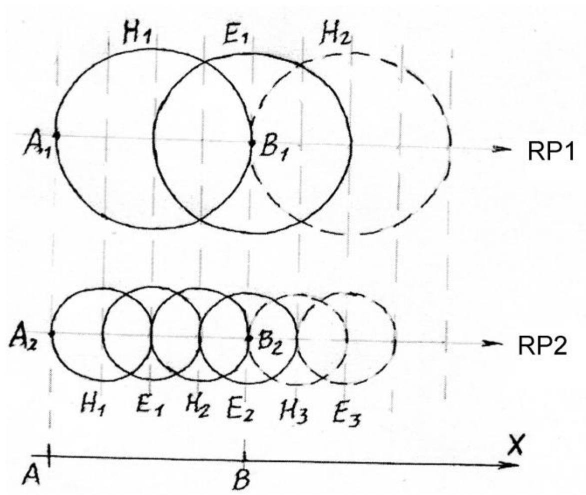


Fig. 15_3. Vortices of two RPs with a frequency that is two times different (vortices H and E are conventionally deployed in one plane)

Point A is a conditional point for the start simultaneous generation of RP1 and RP2. For a period of time T (period RP1) for this RP1 will be formed two vortices (one magnetic and one electric). RP1 are "moved" the distance L (the wavelength of RP1) and "turns out" at point B1 (at this point a new magnetic vortex will form). For RP2, which has a frequency twice as large, four vortices will be formed (two magnetic and two electric ones) during a time T (two periods RP2). The RP2 are "moved" the distance 2ℓ (where ℓ is the wavelength of RP2) and "turn out" at point B2 The points B1 and B2 will coincide with each other, since L = 2ℓ, which means that the speed of movement of RP1 and RP2 is the same (= c).

Let us now determine the total length of the formed vortices RP1 and RP2. During the time T y RP1, the total length of vortices will be 2πL, while for RP2 the total length of the formed vortices will be 4πℓ. Two given total lengths of vortices RP1 and RP2 are equal to each other. This means that the rates of formation of vortices in RP1 and RP2 are also equal to each other. Obviously, it is the equality of the rates of vortex formation that ensures the equality of the propagation rates of real photons RP1 and RP2 (= c).

Let us now determine the rate of formation of vortices (C2CS chains) in RP1 and RP2. In the two-sided formation of chains C2CS from the point of vortex formation, the rate of formation of chains C2CS is obtained equal to πc. Thus the number π in addition to its geometric meaning (the ratio of the length of the circle to its diameter) also obtains a physical meaning - the ratio of the rate of formation of the C2CS chains (RP vortices) to the speed of light (the speed of propagation of the RP).

The performed analysis of the speed of propagation of the RP is made on the example of round vortices of the RP On the example of elliptical vortices, we would have obtained the same result. Due to the economy of space and time, we do not present here this version of the analysis.

Impulse of the real photon

How is the RP pulse formed and how is it transmitted from the vortex to the vortex? The process of formation of the pulse of the RP is related to the process of separating one center of mass (an excited simple) into two centers of mass, "blow-off" to the normal energy of the simple and the RP vortex formed. The last two centers of mass were scattered in different directions with respect to the initial center of mass, i.e. thus received impulses. The impulse of the "blow-off" simple , which has a large mass, manifests itself in its small displacement, which is quickly extinguished by the "cobweb" of the bonds of this simple with other simples. But the impulse of the RP, which has a very small equivalent mass, gives it a significant "speed". Considering the insignificant connection between the vortices of the RP and other simples (because of the insignificant mass of the RP), the formed RP "flies away".

What is "RP fly away"? We have already answered this question: the process of formation of RP-vortices (C2CS chains) in space is proceeding successively one after another, so that their centers are located on the same straight line. Why are they formed on the same straight line? Before answering this question, let us consider a corpuscular-vortex model of a virtual photon.

<u>Corpuscular-vortex model of VP:</u>
The vortex model of a stationary virtual photon is shown in Fig. 15_4.

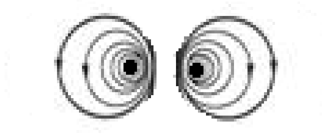


Fig. 15_4. Vortex model of a virtual photon with a "coat"

A feature of this vortex model is the view of secondary vortices. They collectively form a "coat" around the primary vortex of the VP formed by the superwave (random coincidence of the directions of the C2CS vectors in a certain region of space). The appearance of this "coat" is similar to the magnetic field lines around the current loop. Here it can be noted that the energy of the primary vortex of the VP is very small, and the energy of the secondary vortices of the VP, each individually, is even smaller. As a result, the secondary vortexes can not form (build) subsequent tertiary vortices (chains of C2CS). As a result, the "coat" of the secondary vortexes of the VP performs only the role of the magnetic or dipole moment of the VP (see Fig. 1_2) during the time that the primary vortex "spins". This determines the virtual character of the VP, i.e. the limited time of their existence and the absence of vortex propagation in space.

Transmission of momentum between RP vortices:

Option 1:

After the formation of the C2CS chains of the RP primary magnetic vortex, its secondary vortices (chains of the C2CS-MD) are initially formed, too, in the form of a "fur coat", as in the VP. And at that moment the received impulse of the RP, or rather the inertia of material objects, which is an integral part of the impulse of these objects, begins to "work". Inertia "shifts" all the secondary chains of C2CS in the direction of the action of the pulse into a single secondary electric vortex, gradually increasing its energy to a maximum equal to the energy of the previous magnetic vortex, which then disappears (its C2CS chain are disintegrated, the orientation of the C2CS entering it becomes arbitrary). Next, in the same way, the next vortex, the next one, and so on, form. etc.

Option 2:

Secondary vortices (C2CS chains of the electric vortex) begin to grow from the center of the primary magnetic vortex two ways from its center of plane. The presence of a pulse (inertia) in the RP leads to the bending of the magnetic moments of the secondary electric vortices along the direction of the action of the pulse. As a result, all the secondary vortices are assembled into a single vortex. Next, in the same way, the next vortex, the next one, and so on, form. etc.

Option 3:

The force of inertia pulls the primary magnetic vortex into an ellipse. In this case, the point of generation of the secondary vortex shifts to the second focus of the ellipse. The second vortex, under the action of inertia force, also is transformed into an ellipse. Next, in the same way, the next vortex, the next one, and so on, form. etc.

Form of vortices RP:

All the variants of the directed formation of RP vortices can be "work" for both circular (see Fig. 15_3) and for the elliptical shape of vortex (see Figures 1-6 and 1-7). The physical basis for the transformation of the round vortices of the RP into elliptical ones can be the effect of inertia forces on them. At the same time, however, an additional question arises - will the work on changing the shape of the vortex to lead to a loss of part of its energy and the gradual "attenuation" of the energy of the RP. As is known, the RP extends to millions and billions of light years without damping, which indicates that the issue of the possibility of changing the round shape of the vortex of the RP to the elliptical requires additional theoretical and experimental research.

Minimum and maximum wavelength of the RP:

According to reference data, the wavelength of real photons lies in the range from 10 km to 5 pm. There are photons and with a wavelength of <5 pm, they are given the special name gamma quanta. The S-model of the RP makes it possible to estimate the minimum wavelength of gamma quanta. It must correspond to the RP with maximum energy. RP are emitted from simples. The maximum simples are the tau-simples with a mass (energy) equal to 7.733128152 MeV.

If this energy is taken as the maximum energy of gamma quanta, then their minimum length will be equal to:

$$Lmin = h*c / m_{ST} = 0.16 \text{ pm}$$

Of course, in nuclear processes, especially in accelerators, simple-bagels can burst, unfold into simple-spirals that, under the action of their powerful internal magnetic vortices, can be combined into long blocks (super simple-spirals) with a mass (energy) greater than tau-simples. These super simple-spirals are unstable, short-lived. They will disintegrate (break) into smaller particles, but may enter into annihilation with other super simple-spirals of the opposite charge, "dump" from themselves of the envelope of electric toroidal vortices and be transformed into gamma-quanta with even greater energy, i.e. even with a shorter wavelength. Let's try to estimate the minimum and maximum wavelength of the RP more accurately.

For an estimate, we once again clarify that the electric and magnetic vortices in a two-component space are chains of corpuscles C2CS. It is known that the higher the vortex energy, the higher the frequency of their cyclic regeneration, the shorter the wavelength of this process, and the smaller the diameter of the vortices. In this case, as we have already explained, the decrease in the diameter of the vortices with increasing energy is, in our opinion, due to the fact that the vortices with higher energy are more "thick", i.e. consist of several chains of corpuscles C2CS. Having repeatedly analyzed this dependence from all sides, we came to the model that all vortices can be represented figuratively, in the form of a twisted spiral spring from a mechanical clock. The more tightly the spring is twisted, the more the turns it consists of, the higher the energy stored in it.

This model can be visually demonstrated by the example of vortices of two real photons, with a frequency that differs by a factor of two, shown in Fig. 15_3. We have already calculated that on the segment AB (time T), vortexes RP1 and RP2 "wind" an absolutely identical length equal to $2\pi L = 4\pi\ell$, where $L = 2\ell$. In other words, all real photons, on the same segments of their "flight", are "reel up" always the same total length of their vortices. At the same time, we know that the energy of RP2 is twice the energy of RP1. This can only be if the RP2 vortices are thicker as thick as the RP1 vortices, that is, if the number of C2CS chains in RP2 vortices is twice as large as the number of C2CS chains in the RP1. Thus, the energy of real photons can be considered in units of the number of C2CS chains in the RP vortex. In fact, we have now quantized the structure of the electric and magnetic vortices of the RP in the same units that our space consists of.

And now let's try to calculate the number of C2CS chains in RP vortices of different ranges of electromagnetic waves. In Table. 15_1 shows the frequencies and wavelengths of RPs of the different bands.

Table. 15_1.

Range	Frequency (Hz)		Wavelength (m)	
	from	to	from	to
Extra long	<30 кГц	3.00E+04	1.00E+04	>10 км
Long	3.00E+04	3.00E+05	1.00E+03	1.00E+04
Medium	3.00E+05	3.00E+06	1.00E+02	1.00E+03
Short	3.00E+06	3.00E+07	1.00E+01	1.00E+02
Ultra short	3.00E+07	3.00E+12	1.00E-04	1.00E+01
Infrared	3.00E+11	4.29E+14	7.80E-07	1.00E-03
Visible	4.29E+14	7.50E+14	3.80E-07	7.80E-07
Ultraviolet	7.50E+14	3.00E+16	1.00E-08	3.80E-07
X-ray	3.00E+16	6.00E+19	5.00E-12	1.00E-08
Gamma	6.00E+19	$>6*10^{19}$	<5 пм	5.00E-12

This table contains two uncertainties. Until now, the parameters of the longest and shortest electromagnetic waves (RP) have not been established. We dare to assume that the shortest electromagnetic waves have RP-vortices in size equal to the diameter of the primary vortices of the VP. We explain this assumption:

1. Both these photons (both RP and VP) consist of electric and magnetic vortices, which are chains of corpuscles C2CS.

2. Primary vortices of VP are formed as a super wave (random coincidence of directions of vectors) of C2CS corpuscles in a certain limited volume of space. The assumption that as a result of superwaves was born the vortexes of VP of different diameters can be produced, it would obviously be erroneous, since the process of formation of a super wave has a certain duration in time, during which a build-up in a certain volume of space takes place of the number of corpuscles C2CS with the same orientation of the vectors. And it will be interrupted, as soon as this quantity reaches a certain minimum limit, at which the primary vortex of the VP forms. Therefore, all VPs have the same primary vortices.

3. Vortexes of the RP are formed in a different way, - the curl of the internal magnetic vortex of the simple, is pulled out of the simple, and folds into the primary magnetic vortex of the RP. It can be assumed that the minimum size of this vortex will be equal to the size of the VP vortex. Otherwise, if it were smaller, the VP could also be formed with a smaller size of its primary vortex.

As a result, we established that the minimum wavelength (diameter of a vortex) of gamma quanta is equal to the diameter of the VP (d = 0.000589 fm = 5.89E-19 m), which corresponds to a frequency equal to 5.09E + 26 Hz.

Now we need to set the maximum wavelength - the diameter of the largest RP-vortex. It is he (the largest RP-vortex) that will represent the maximally dissolved spiral spring consisting of one chain C2CS, which will "twist" into more turns (chains C2CS) with increasing RP frequency. Our searches on the Internet have led us to detailing of the range of ultra-long waves to the following sub-bands of radio waves, including those used for communication with submarines:

A) Radio waves of extremely low frequencies (ELF, ELF, 3-30 Hz, wavelength 100 000-10 000 km) easily pass through the Earth and sea water.

B) Radio waves of ultralow frequencies or super low frequencies (SLF, SLF, 30-300 Hz, wavelength of 10 000-1000 km) also easily penetrate the Earth and sea water, but have antenna element dimensions of an order of magnitude smaller.

C) Radio waves of infra low frequencies (INCH, ILF 300-3000 Hz) have more compact antenna elements, but less penetration into the thickness of marine and terrestrial depths.

D) Radio waves of very low frequencies (VLF 3-30 kHz) have even more compact antennas in comparison with the previous ranges, but can penetrate into the sea water only to depths of up to 20 meters, overcoming the surface effect.

Purely phenomenologically, we assume that the lowest RP frequency can be 1 Hz, which corresponds to a wavelength of 300,000 km, and the length of the RP vortex circle is 942,000 km, consisting of one C2CS chain. How much this assumption will affect the results of our calculations, we estimate a little lower.

Knowing that for the RP with a frequency of 1 Hz, the number of C2CS chains in its vortex (the number of turns of C2CS) is one (N = 1), will calculate the number of turns C2CS (N) for all other RP bands (it will be equal to the frequency of the corresponding RP).

Further, to calculate the photon energy of the RP, we calculate the RP energy with a frequency of 1 Hz by the formula E = hv, it turned out to be 6.63 * 10^{-34} J. We obtained the RP energy, whose vortices consist of one chain C2CS (one turn C2CS or N = 1). Knowing that the energy of the RP is proportional to the number of turns C2CS , we find the energy of the RP of all ranges. The results of the calculation are presented in Table. 15_2.

Table. 15_2

Range	Frequency (Hz)		Wavelength (m)		N (number of circuits C2CS)		E (J)	
	from	to	from	to	to	from	to	from
Extra long	1.00E+00	3.00E+04	1.00E+04	3.00E+08	3.00E+04	1.00E+00	1.99E-29	6.63E-34
Long	3.00E+04	3.00E+05	1.00E+03	1.00E+04	3.00E+05	3.00E+04	1.99E-28	1.99E-29
Medium	3.00E+05	3.00E+06	1.00E+02	1.00E+03	3.00E+06	3.00E+05	1.99E-27	1.99E-28
Short	3.00E+06	3.00E+07	1.00E+01	1.00E+02	3.00E+07	3.00E+06	1.99E-26	1.99E-27
Ultra short	3.00E+07	3.00E+12	1.00E-04	1.00E+01	3.00E+12	3.00E+07	1.99E-21	1.99E-26
Infrared	3.00E+11	4.29E+14	7.80E-07	1.00E-03	3.84E+14	3.00E+11	2.55E-19	1.99E-22
Visible	4.29E+14	7.50E+14	3.80E-07	7.80E-07	7.89E+14	3.84E+14	5.23E-19	2.55E-19
Ultraviolet	7.50E+14	3.00E+16	1.00E-08	3.80E-07	3.00E+16	7.89E+14	1.99E-17	5.23E-19
X-ray	3.00E+16	6.00E+19	5.00E-12	1.00E-08	6.00E+19	3.00E+16	3.98E-14	1.99E-17
Gamma	6.00E+19	5.09E+26	5.89E-19	5.00E-12	5.09E+26	6.00E+19	3.37E-07	3.98E-14

Let's check the calculation we performed by calculating the energy of the smallest vortex (VP) according to the formula E = hv = 6.62607E-34 * 5.09E + 26 = 3.3734E-07 j, which converges with the calculation through the number of turns C2CS.

It should be noted that if the frequency of the longest-wavelength photon were taken as 0.1 Hz (ten times less), then the number of turns (N) for the VP would also increase by an order of magnitude and would be 5.09 * 10^{27}, i.e. would have changed by 2 * 10^{-24}%.

Note: We sometimes use the term "photon energy", sometimes "the energy of a photon vortex". According to the vortex (corpuscular) model of the RP, this is one and the same. The energy of the RP vortexes "flows" from one vortex to another. The maximum energy of one vortex is the energy of a photon. After a maximum, it begins to decrease, but the energy of the second formed RP vortex begins to increase. In the case of VP, this remark is valid with respect to the energy of the primary vortex of the VP.

Time of life of the real photon:

Why are RP vortexes, being open, do not lose their energy and the RP can spread to millions and billions of light years? We guess that the energy-consuming model is a model of aggregates consisting of their electromagnetic vortices forming a "fur coat" (see Figures 1_12 and 15_4). It is the "fur coat" that generates and "pulls" the vortices in different directions, leading to a "sprawling" of energy and damping of the power of such an aggregate. In real photons, the vortexes of "fur coats" are collected by the impulse of the RP (the force of inertia) into a single vortex that generates a new "coat" of secondary vortices, which are again collected by the impulse into a single vortex, etc. No energy is lost and R3 can "fly" forever.

Comparison of the RP vortex model with the field model (Maxwell equations):

We will not quote Maxwell's equations (they have already accumulated several different versions of the record) and compare them with the vortex physical model of the RP that we have presented. On a large (Hamburg) account this is the mission of the theory of electromagnetic vortexes mentioned by us. We note only one element in which Maxwell's equations (or rather their rather wide interpretation) diverge from the vector model of the RP. We are talking about the relationship between the phases of the electrical and magnetic components of the RP. For some reason, in many sources, for example [36], when explaining the Maxwell equations, the electric and magnetic field strengths are represented as in-phase, see Fig. 15_5.

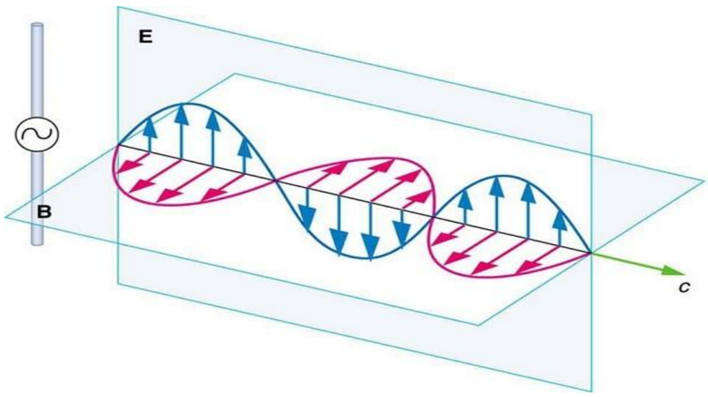


Fig. 15_5. Diagrams of electric and magnetic field strength in the real photon, according to Maxwell's equations

In accordance with the presented vortex model of the RP, the magnetic and electric vortices are clearly phase shifted by 90 °, as shown in Fig. 15_6.

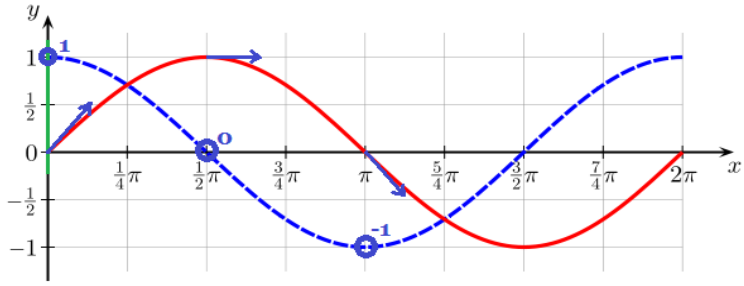


Fig. 15_6. Diagrams of electric field strength (red color) and magnetic field (blue color) RP, according to the RP-vortex model for ST

The negative values of the strengths in Fig. 16_6 mean that adjacent electric and magnetic vortices change their direction of rotation to the opposite, as shown in Fig. 15_7. The last three figures were taken from the Internet.

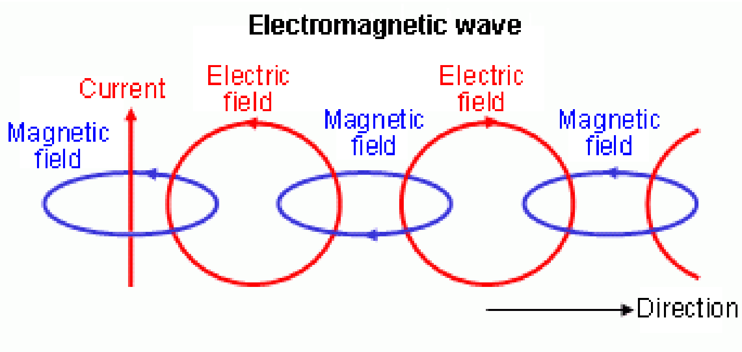


Fig. 15_7. Alternating rotation of neighboring electric and magnetic vortices in a real photon

It seems to us that the theory of electromagnetic vortices, which should integrate and unite all the provisions of the Unified vortex field theory (Chapter 11), classical and quantum electrodynamics and the corpuscular theory of two-component space, should answer this question with respect to the vortex phases of the real photon (and many others).

Conclusion on the corpuscular-vortex model of the real photon:

We analyzed with you a corpuscular-vortex physical model of real photons, based on the Theory of Electromagnetic Vortices, Unified Vortex Field Theory and Theory of Two-Component Space (Fourth Physics). The results of the study of the movement of the RP in this model correspond to the conclusions of classical electrodynamics, and at the same time the internal processes occurring in the RP at a corpuscular-vortex level are more closely reflected.

Electromagnetic and gravitational interaction in a two-component space (insert as of 11/17/2017)

As we disassembled, the electromagnetic and gravitational interaction is based on the interaction of electromagnetic charges, transferred from charge to charge by the flagellums of the C2CS corpuscles. The strong interaction between nucleons in atomic nuclei is also an electromagnetic interaction between magnetic charges formed by slotted magnets of nucleons and is also transmitted through the C2CS flagellums. The increased value of the energy (force) of the strong interaction is determined by the special shape of the slotted magnets of the nucleons and by the very small distance between them. Below we will stop analyzing the properties of the electromagnetic (and gravitational) interaction at "large" distances (not inside the nuclear one).

The range of electromagnetic (and gravitational) interaction

It is known that the force of electromagnetic (and gravitational) interaction decreases inversely proportional to the square of the distance between the sources of charges to which C2CS flagellums are attached. In the simplest case of a stationary field, for example, from a single stationary electric charge, the C2CS flagellums will diverge from the charge by direct rays uniformly distributed in space. Obviously, for a finite cross section and for a finite number of C2CS flagellums attached to charges, at large distances from charges they will begin to be distributed in space without touching each other. The question arises, - and then will there be electromagnetic (and gravitational) interaction at the points of space lying between the flagellums C2CS? At some distance from the "source" of the C2CS flagellums , the distance between them can reach such values that in the these "voids" some space objects can be placed. Of course, under the influence of electromagnetic forces, the flagellums can bend toward this object and interact with the flagellums C2CS emanating from this object, forming with them a kind of "scythe" of the flagellums C2CS, thickened in the middle part. If there are several such "braids" between the charge and other objects, the space between the "braids" will become "bare" even more, there may not be any chains of C2CS emanating from the charge. If in this area of space there is a very small object, then it will not experience any interaction with our charge. If this scheme is extended further away from the charge, then we can conclude that there is some limiting distance at which the interaction of the flagellums C2CS of our charge with other objects will cease completely. True, this distance will be different for objects with different masses (with a different number of simples).

The speed of propagation of electromagnetic and gravitational interaction in space

In the stationary model, when all the bodies are immovable relative to each other, their mass does not change and the whole system of bodies has existed for a long time, it does not make sense to talk about the propagation velocity of electromagnetic and gravitational interactions (the C2CS chains have already formed in the form of "braids" and the entire system is in some equilibrium).

Everything changes when the system comes into motion, or the mass of bodies begins to change. Various factors start acting here, which ultimately lead to reformatting of the C2CS chains (their shortening, elongation, thickening, thinning, etc.). Let us dwell on the process of increasing the length of chains C2CS. When analyzing the corpuscular-vortex model of formation of the RP, we established that RP vortices are formed from chains of C2CS round form (by turning them in place) and that the process of their formation along the circle goes with the speed π*c, where π is the number "pi", c is the speed of light. But, if in the RP this resulted in a constant speed of "propagation" of the RP at the speed of light (c), in our case of forming (reforming) C2CS chains along a straight line, it turns out that this process must also occur at a speed of π*c. And this means that gravitational waves (GW) should propagate at a speed of π*c.

Physicists, of course, already counted (see the source [37]) that, based on the data of the LIGO and Virgo observatories, the speed of gravity propagation (they wrote it this way) differs from the speed of light no more than -3E-15 and +7E-16. Calculations were carried out conducted by the difference in the arrival time of the light and gravitational signals.

It is possible that our theoretical method has somehow crept into error. But it is possible that if the propagation speed of the RP (light) and the propagation velocity of the GW (reformatting the C2CS chains) actually differ by a factor of π, then the error "sits" in the method of comparing the arrival time of the light and gravitational signals. This issue, in our opinion, should be the subject of additional research and experiments.

Scheme of experiment on the formation of simples (part 4)

The proposed model of a two-component space allows us to explain the process of the production of virtual photons. It also allows you to try to clarify some parameters of the experiment on the formation of simples. We described the scheme of this experiment and the features of detecting the resulting simples in Chapter 1. In Chapter 11 we were able to calculate the ratio (K = 117.7) of the magnetic strength of the magnetic flux escaping from the burst Black Hole and the magnetic field strength of the virtual photon. If we can determine the magnitude of the magnetic intensity of a virtual photon, then we can calculate what intensity should be the magnetic flux, which must be irradiated with a vacuum, to stretch the VP to the simple-spirale.

At the moment we know the wavelength (diameter) of the VP (d = 0.00589 fm) and the corresponding VP frequency ($5.09 * 10^{26}$ Hz). This resembles the smallest real photon (RP), which has the same size as the VP, but on this their similarity ends. In fact, we can not "attribute" to the VP $5.09 * 10^{26}$ "turns" of chains C2CS and the corresponding energy equal to $3.37 * 10^{-7}$ J, as in a real photon with the same size of a vortex (see Table 15_2). To think, that the superwave of C2CS corpuscles, when their vectors coincide in some small space (0.00598 fm), will form such a large number of turns of C2CS chains in the VP - it is simply not conceivable. So many turns of C2CS chains and such energy can be "thrust" into the vortex only under the influence of a powerful curl of the magnetic vortex that flew out from the simple (into the simple, this energy was "pumped" by a powerful magnetic flux of burst BBH). We have already mentioned that VP is the most low-power vortex created by the super wave of corpuscles C2CS. If the VP could have an even smaller energy, then the VP would arise precisely with this energy. We already know that the minimum energy can be in a vortex containing one C2CS chain. Let's try to calculate the intensity of the magnetic moment of VP, containing only one C2CS chain, taking as the basis for calculating the formula for one turn of a wire with a current. Of course, equating the electric vortex of the VP to the turn of the wire with the current (charges) is a great approximation, but we do not have another theoretical analog. Let's see what we will get.

1. We calculate the inductance of VP:

$$L_{VP} = 0.0002\pi D\,[\ln (8D / d-1.75)] = 1.424E\text{-}20 \text{ H},$$

where D is the diameter of the VP (0.00589 fm), d is the diameter of the revolution of the C2CS chains ($d = \ell_P$ = 1,616E-35 m)

2. Calculate the vortex current of the VP (what it is, we do not really know, this is what is "spinning"):

$$I_{VP} = (2E_1 / L_{VP})\ 1/2 = 3{,}05E\text{-}07 \text{ A}$$

where E_1 = 6.63E-34 joule is the vortex energy from one C2CS chain (see Table 15_2)

3. Calculate the intensity of the magnetic field VP:

$$H_{VP} = I_{VP} / D = 5.18E + 11 \text{ A / m}$$

4. Calculate the magnetic intensity of the experimental setup for the formation of simples:

$$H_{EXP} = 117.7 * H_{VF} = 6.1E\text{+}13 \text{ A / m}$$

Conclusion: We obtained the value much larger than the most powerful NHMFL magnet creating a magnetic flux of the order of 50 T (data of 2003), which corresponds to a magnetic field strength of 3.98E+7 A / m. What are the prospects for increasing this capacity by another six orders, we do not know. A word for experts in experimental physics.

Balance and the law of conservation of energy in S_theory and Fourth physics

This section was absent in the first edition of ST. The need to add it arose after a detailed discussion of the work with V.U. Vtorushin, during which some gaps in the coverage of the issues of the global motion (origin and transformation) of energy in the Fourth Physics and S_theory were revealed. Below we tried to investigate and, if possible, close these gaps.

We have already noted that some theoretical physicists have a desire to abandon the Law of conservation of energy at the level of micro processes occurring at the quantum level. The term "quantum level" may not be quite accurate, we had in mind the level of subelementary particles, i.e. the level of new physicists operating with objects and processes to the level of physics of the Standard Model.

In our opinion, it is still too early to attempt to generalize this whole area of physics (before the Standard Model) into one theory, especially trying to combine it with the physics of the Standard Model. It seems to us that this area of objectively existing entities and processes can be divided into at least two parts.

One part is, conditionally speaking, the material world (what we called S_theory and described the processes occurring in it, starting with the process of formation of resonant simples from virtual photons, and ending with the processes of the further evolution of matter, up to our days). This part of the new physics is integrated with the Standard Model and is based on a unified theory of the interaction of electromagnetic vortices (TEMV).

The other part is the theory of space in which virtual photons are born (what we call the Fourth Physics and presented as a model of a two-component space consisting of C2CS corpuscles with vortices C1 and C2). The nature of the vortexes C1 and C2, in our view, is genealogically related to electric and magnetic vortices, but not identical to them, otherwise the process of nesting of electromagnetic vortices can turn out to be infinite.

Between these two parts of the new physics, there are intermediate stages of the evolution of matter (the oscillation of virtual photons, the formation of primary simples and the conglomeration of them into the first Black hole, and now yet the chains flagellums C2CS). Now, after the physical analysis of these the processes, it is more correct to relate their to S_theory, and not to the Fourth Physics. We will bear this in mind, formally leaving everything as we stated earlier.

Let us now construct a global scheme of the stages of the birth of the universe (matter, mass, energy) according to Fourth physics and S_theory, see Fig. 15_7.

C2CS

↓

(superwave)

↓

VP^0, VP^+, VP^-

↓

(oscillation VP +, VP -)

↓

primary simples S^0, S^+, S^-

↓

(conglomeration S^+ и S^- в BH_1)

↓

BH_1

↓

(growth of mass BH_1 to critical)

↓

BBH_1

↓

(bursting BBH1 - Big Bang - the outward emission of a powerful magnetic pulse - SPMF)

↓

VP + SPMF = S
(continuous spectrum of lengths)

↓

(spectrum formation resonance simples)

↓

Su, Sd, Se, Sμ, Sτ

↓

(the formation of matter, dark matter, gamma quanta and real photons, electron neutrinos)

↓

SUB, DM, γ, RP, v_e = Universe

Fourth physics (space physics)

S_theory (electromagnetic universe)

Fig. 15_7. The global scheme of the birth of the universe (matter, mass, energy)

Note: The formation of the Anti-Universe in the above scheme is not included, it is believed that the Universe and Anti-Universe at Great explosion flew in different directions and conduct independent development (evolution), and, for the time being, do not affect each other's energy.

Before proceeding to an analysis of the motion of energy from stage to stage, we recall that each of the corpuscles of C2CS possesses a certain minimal elementary energy. The phenomenological model of the allocation of energy to corpuscles was considered in the section "Variants of the formation of a two-component space".

The law of conservation of energy in S_theory and Fourth physics (insert ST2 of 10/20/2017)

Let us pass to the analysis of the energy processes occurring at each stage of the birth of the universe.

The fact that C2CS contains the energy of the cyclic process of mutual transformation of the vortices C1 and C2, we hope no one will object. It is this energy of C2CS corpuscles, through the formation of a superwave, that generates virtual photons and empowers them with their energy. Further, by means of a complex and prolonged oscillation process of virtual photons, primary simulations are formed that conglomerate into the first Black hole and transmit their energy to it. Having accumulated a critical mass, BH bursts and the stage of formation of secondary resonant simples begins. The energy of a powerful magnetic field (C2CS chains) that escapes from a burst BH stretches virtual photons in the surrounding space into simples-spirals and transforms into the energy of their electromagnetic vortices. Simples-spirals can not exist for a long time, they have open ends, which play the role of powerful magnetic poles. As a result, large simples-spirals individually, and small simples-spirals in the composition of blocks are folded into simples-bagels. At the same time, the majority of the energy of the simples is concentrated in the internal magnetic vortex of simples, giving them an inertial mass. Electric charges and magnetic moments of the formed simples collect them into blocks and elementary particles (neutrinos), which are assembled into toroidal aggregates of relic neutrons - the progenitors of all protons and neutrons forming isotopes (substance). The process of formation of relic neutrons ends with the exhaustion of a certain kind of simples formed in the smallest amount. Simples not included in relic neutrons (substance) form particles of Dark matter. The sum of the internal energy of all the simples of substance and Dark matter is the total energy of the universe. In the universe are begin the processes of star formation, which trigger the processes of nuclear reactions. In all nuclear reactions, the released energy is the internal energy of the bursting of simples. Eventually can be said that all the energy of substance and Dark matter originally took their energy of spatial corpuscles C2CS.

At all stages of this scheme, starting with the stage of oscillation of virtual photons, some part of the energy that is is carried away by electron-neutrinos and gamma-quants is lost. No part of the energy disappears into nowhere, and does not appear out of nowhere. The total balance of all energy is preserved at all stages.

If we take into account the energy of electron-neutrino and gamma-quanta in the process of compiling the Energy Balance, we can assert that the law of energy conservation is also observed in Fourth physics and in S_theory.

To be or not to be (rewriting S_theory) - that is the question (?)

Fourth physics - the theory of a two-component space, consisting of corpuscles C2CS, in which the components C1 and C2 are "revolve", genealogically related to electric and magnetic vortices, should be to "compel" to us, - to rewrite S_theory and replace in it the flagellums of virtual photons and gluons by chains (flagellums) of C2CS corpuscles.

However, we did not do this for two reasons:

1. At the time of the development of S_theory and in the process of writing it, we absolutely knew nothing about the two-component space and its corpuscles. All previous scientific baggage of electromagnetic and strong interactions was built on photons and gluons. All the exposition of the S_theory with the use of this accumulated instrumentation went "like clockwork". We thinked that this terminology was familiar to readers and did not cause rejection. The new terminology, as well as the objects themselves (corpuscles of the two-component space) must still be recognized and settled. It's probably pointless to talk about their experimental detection and confirmation. It is unlikely that we will ever have such tools. But the consequences of the Fourth Physics can probably be verified. One of these consequences is the velocity of propagation of gravitational waves.That's why we did not begin to change this terminology.

2. We could move the 15th chapter at the beginning of the our work and make it the first. In this case, we "in the first lines" of our work would acquaint readers with the model of a two-component space and the terminology of the C2CS corpuscles, of which it consists. Further, one could "calmly" expound S_theory, using the already new terminology. But we think that in this case, readers sould stoped reading our work somewhere in the middle of the first chapter, in that place where we exclude time from the number of physical essences.

With the chosen order of presentation of the material, we hope that some readers have read our work to the end, for which we are grateful to them.

We believe that, the order of presentation of the our work, that we chose was natural in terms of our task - to find the first-brick of matter (simple), of which our world is composed . We started with it. All the further content of the work is a development and to some extent a test of our main idea of stretching virtual photons by a powerful magnetic field. Under verification we mean the volumetric and careful recounting of a large number of nuclear reaction types based on the S_models ST and comparing the results with known experimental data.

Practical application of a two-component space (vortexonics)

Mentally we "look" once again at the process (model) of the creation of virtual photons described by us and the formation of stable material particles from them.

In fact, it is a model of a continuous and infinitely working battery.

What is a battery? Two electrodes were placed into an acid or an alkaline solution, and an electric current are flowed between them.

By analogy, as an "acid" we take a two-component space that continuously and infinitely generates virtual photons (VP). Each VP has an electric and magnetic moment, however, they are directed in completely different directions. And if we put two "electrodes" into this "acid", capable of catching electric or magnetic moments from the VP, and in addition to the "circuit" between them we will insert a vortex "diode" (polarizer) capable of letting electric or magnetic vortices only of a certain orientation, then we will get a continuously and infinitely working vortex "battery". In this case, all conservation laws are not violated - after all, the two-component space can give birth to entire Universes.

In fact, it is about the creation of a new technology for using the energy of multidirectional electric and magnetic vortices and the creation on its basis of applied science, a kind of "vortexonics", with its new element base (vortex generators, conductors, diodes, etc.). Well, and having learned to "extract" the vortex electricity from space, we will be close to new space thruster with an infinite resource.

And, if we recall the theoretical assumption made by us about the speed of constructing C2CS chains with the speed π*c, then there is an additional possibility to increase the information transfer rate in devices based on the vortexonics.

Conclusion of chapter 15

The main result of this chapter is the development of a physical model of a two-component space that is a collection of "microscopic" corpuscles (C2CS), in each of which there is a cyclic process of the transformation of components (vortices) C1 into C2 and back, forming together a single, global and infinite space. The cyclic process of the transformation of components (vortices) C1 into C2 and back is genealogically equivalent to the transformation of electric and magnetic vortices (E and H) in a virtual photon. Three variants of the formation of a two-component space are proposed, one of which is considered in more detail.

On the basis of the model of the two-component space, a physical model for the formation of virtual photons is proposed, as well as a physical model of the process of oscillations the continuously generated mass of virtual photons into primary simples, from which, through their conglomeration, the 1st Black Hole is formed. Continuous growth of the 1st Black Hole, due to the conglomeration of more and more new simples, leads to its bursting, which generates the process of formation and evolution of the paired Universe and Anti-Universe, consisting from - the first from the matter, the second from the antimatter.

The idea of a two-component space consisting of their corpuscles C2CS also allowed to modify the Single vortex field theory, replacing in it the concepts of the flagellums of the VP and the gluon flagellums on the notion of chains (flagellums) of C2CS. This replacement made it possible to proceed to the interpretation of electric and magnetic fields (their lines of force) in the form of chains C2CS, which allowed solving a number of dilemmas of

S_theory. In fact, the S_theory and the concept of a two-component space are combined into a unified physical theory.

The modified corpuscular-wave theory allowed us to reconsider a whole series of issues related to the formation and interaction of real and virtual photons, the formation of simples, and electromagnetic (and gravitational) interactions, at a new deeper level.

It is noted that the model of a two-component space can have a pragmatic result of "extracting" energy from space (vacuum) and constructing devices based on "vortexonics".

Conclusion of work

Brief resume (edition of 08.11.2017)

In modern physics, at the present time, a kind of "thrombus" (or an explosive mixture) from classical theories, innovative concepts, hypotheses, and absolutely fantastic ideas has emerged. A significant role in this situation was played by a hypertrophied fascination with mathematical methods of modeling physical processes. The "correctness" of theories is determined by the number of sigma.

That to exit this, in our opinion, a vicious circle, we can only by return to the priority of physical models in the study of objects, processes and phenomena of nature.

In this paper, we attempted this by proposing a physical model of the basic corpuscular object, the simple, on the basis of which a single S_theory (concept) was built using physical modeling methods, combining a whole series of so far separated physics sections. In a few words, S_theory is a physical model of the formation and evolution of our universe. This is the main thing in our work.

It should also be noted that all physical models (S_models) of all elements of matter and the processes of its formation and evolution are constructed on the basis of the Theory of Electromagnetic Vortices (TEMV), whose separate positions and postulates should be checked and proved experimentally to a large extent. In our work, the described processes of interaction between electric and magnetic vortices and their results have been compiled to a great extent on the basis of phenomenological analysis and individual analogs in the theory of classical electrodynamics.

One can also speak of insufficient mathematical modeling and justification of the proposed physical models. To a greater extent, this is due to the fact that the mathematical models of the Theory of the interaction of electric and magnetic vortices require even more research and construction.

As for the proposed mathematical models of the S_theory itself (S_model of individual objects), then they are are the result of a compromise. On the one hand, they are determined by the laws of interaction of electric and magnetic vortices, on the other hand they are based on conservation laws and known reference data of elementary and basic particles. Accordingly, the generalized mathematical model of S_theory should be complex. This can not be one, two or more formulas. Rather, it is a multifactorial system of equations in which the individual parameters to some extent depend on each other. This task has yet to be solved, but we consider it, to some extent, purely "technical." In the history of physics, there was not yet a case where a corresponding mathematical basis was not "brought" under any physical theory (joke). So far, the S_models presented in their mathematical part (the number of component parts of the objects under consideration) are the result of a very large work on the conjugation of physical meaning and mathematical combinatory. It is all the more surprising that the results of calculations of specific nuclear reactions by the proposed S-models correlate well with the reference and experimental data of these reactions.

Of course, the main thing is the experimental confirmation of certain provisions of the TEMV and the consequences of S_theory. The list of the main such experiments were given in Chapter 14.

A separate chapter (Fourth Physics) attempts to find approaches that unite corpuscular physics with the physics of space. It seems to us that we have "groped" the basis for such unification in the form of a two-component space model, a genealogically related with concept of coupled electric and magnetic vortices.

Acknowledgments and apologies

We thank the readers who read this work from start to finish. We will be grateful to receive their evaluation of our work.

We apologize for possible typos and inconsistencies in the individual semantic phrases and numerical values in our work. The work is voluminous and, in a certain sense, "pioneering", for 5 years of writing, we had to repeatedly return to the material already written and make appropriate corrections in it, related to the presentation of subsequent chapters, which could lead to some inconsistencies in the material. We tried several times to subtract the "finished" version of the work, each time discovering and correcting the individual "errors". But there is a possibility that some of the inconsistencies in the text of the work still exist. We will be grateful for help in identifying them.

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