Updated controlled thermonuclear reaction

Pastushenko Vladimir Alexandrovich

Abstract

Unlike deuterium - tritium plasma of nuclei of identical charges, which give a certain instability, thermonuclear reactions are physically permissible:

1. method: inelastic collisions of tritium nuclei, without primary plasma, with high-energy protons, at a ready-made collider.
2. Method: structuring of charged counter streams of deuterium plasma at the meeting point, modified by TOKAMAK, by vertical beams of low-energy antiprotons. The reaction products are helium and antiproton, which structures new and new nuclei. At the same time, the number of antiprotons is regulated by beams of protons in annihilation.
3. Method of inelastic collisions in beams of a deuterium nucleus of low energies, without primary plasma.

In general models of the atomic spectrum, the quantum model (X± =${}^4_2He$) of the helium nucleus has the form

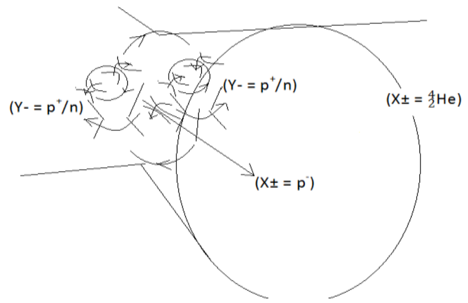


Figure1. Synthesis Model

the structural form of quanta (Y- = p+/n) of strong interaction, structured by the (X-) field, in this case either an antineutrino $(X\pm= \ \nu_e^-)$ or an antiproton $(X\pm= p^-)$. In accordance with the equations of the dynamics of mass fields: $c * rot_Y M(Y -) = rot_Y N(Y -) = \varepsilon_2 * \frac{\partial G(X+)}{\partial T} + \lambda * G(X+)$, we are talking about a controlled

$(v_Y * rot_X 2M(Y-= p^+/n) = \varepsilon_2 * \frac{\partial G(X+={}^4_2He)}{\partial T})$ Thermonuclear reaction:

1) Or in inelastic collisions $(X\pm= {}^4_2\alpha) = (Y-= p^+/n = \mathrm{e}^{**+})(X+= \ \nu_e^-)(Y-= p^+/n = \mathrm{e}^{**+})$ in the collider, colliding beams of low-energy deuterium nuclei, without primary plasma,

2). Or structuring of deuterium plasma by low-energy antiprotons in reactions

$(X\pm= {}^4_2\alpha) = \ (Y-= p^+/n = \mathrm{e}^{**+})(X+= p^-)(Y-= p^+/n = \mathrm{e}^{**+})$, ${}^2_1H + p^- + {}^2_1H \ \rightarrow \ {}^4_2He + p^-$

More efficient conditions for a controlled thermonuclear reaction are counter flows of deuterium plasma with perpendicular injection of antiproton beams at the point of meeting of plasma flows. The flow of deuterium plasma itself is represented by a controlled flow of ions, as a more stable state of plasma in TOKAMAK.

3) or in inelastic collisions of tritium ${}^3_1H + p^+ \rightarrow \ {}^4_2He$, in colliders with high-energy proton beams, without primary plasma.

Two grams of such plasma of synthesized helium is equivalent to 25 tons of gasoline. In all cases, trial experiments are needed on the finished collider.

In all cases, the heat is taken away by the reactor water jacket. Such reactors are safe and environmentally friendly.

There are fundamental reasons and there are inevitable consequences of such physically permissible possibilities.

These are not calculations of energy conditions and technological solutions of a controlled thermonuclear reactor. But this is a theoretical development of the causes and consequences of the state of deuterium plasma and the conditions for its structuring in a controlled thermonuclear reaction. In contrast to the deuterium – tritium $({}^2_1H + {}^3_1H)$ plasma of nuclei of equal charges, which give a certain instability, we are talking about a deuterium $({}^2_1H)$ plasma structured by beams of antiprotons (p^-). There are causes and there are inevitable consequences, which we will consider qualitatively, without quantitative calculations.

From the axioms of dynamic space-matter, considered in “Quantum gravity” , the properties of a single $(X\pm= Y\mp)$ space-matter follow :

$$(X +)(X +) = (Y-) \ \text{or} \qquad (Y +)(Y +) = (X-) \ .$$

Their symmetries give the structural forms of the proton and electron matter . There are quantitative calculations of such structural forms, including the proton and electron. In general, antimatter($X\pm$), or ($Y\pm$) quanta of space-matter, is in the structural form of matter. There are such calculations.

These are geometric facts, we emphasize, of dynamic space-matter , with non-stationary Euclidean space , which correspond to the physical properties of matter. Therefore, the quantum of the Strong Interaction $(Y\pm= p^+/n)$ of the substance of the proton and the neutron in the nucleus of the atom is presented as a structure that has the properties of $(Y\pm= p^+/n = e^{**+})$ antimatter, similar to the antimatter $(Y\pm = e^+)$ of a positron. Therefore, such quanta are in a bound state of matter in the form of a nucleus particle $({}^4_2\alpha)$. A separate quantum of the deuterium nucleus is bound by the substance of the orbital electron, forming the outer substance of the atom $({}^2_1H)$of deuterium.

In this case, $(Y\pm= p^+/n)$ the strong interaction cables themselves have the minimum binding energy in the nucleus $\Delta E = 2 * \alpha * p = 2 * 6{,}9 = 13{,}8MeV$. Their maximum energy in metal nuclei $\Delta E = 2 * 8{,}5 = 17\ MeV$, recorded in experiments . Thus, the nuclei of deuterium in the state of a plasma, in contrast to the matter of atoms of deuterium, are the structure of quanta $(Y\pm= p^+/n = e^{**+})$ of Strong Interaction, with the properties of antimatter similar to positron $(Y\pm = e^+)$. Structuring such plasma by a magnetic field $(X- = p^-)$ of low-energy antiprotons, we have electro $(Y+=$X-) magnetic charge interaction at relatively long distances.

$$(Y+= p^+/n)(X-= p^-)(Y+= p^+/n)$$

This is the first reason for the formation of a structure in deuterium plasma. In this case, we are not talking about the calculated densities of the generated electromagnetic symmetrical $(Y+)(X-)(Y+)$field in the plasma in accordance with Maxwell's equations,

$$rot_x E(Y+) = -\mu_1 \frac{\partial H(X-)}{\partial T}$$

Already in such a structure in the plasma, $\left(Y+= \frac{p^+}{n}\right)(X-= p^-)\left(Y+= \frac{p^+}{n}\right) = НОЛ$, as the Indivisible Region of Localization of dynamic space-matter. And already the mass trajectories of the $(Y-= p^+/n = e^{**+})$quanta of the Strong Interaction are in the vortex flow of mass trajectories

$$(c * rot_Y M(Y- = p^+/n) = \varepsilon_2 * \frac{\partial G(X+=p^-)}{\partial T})$$

of exactly such equations, with the subsequent transition into closed $\left(c * rot_Y M(Y-)\right)$ vortex flows of their mass $(Y-= p^+/n)$ trajectories already in the field of the Strong Interaction of the antiproton , that is, the primary structure:

$$(X\pm= {}^4_2\alpha) = (Y-= p^+/n = e^{**+})(X+= p^-)(Y-= p^+/n = e^{**+})...$$

And this is the second reason for the formation of such a structural form in deuterium plasma. From the properties of dynamic space-matter, the antiproton simply flies out, "is generated", that is, it is "ejected" from such a structural form of the substance already of the helium nucleus in its final form:

$$(X\pm= {}^4_2\alpha) = (Y-= p^+/n = e^{**+})(Y-= p^+/n = e^{**+}),$$

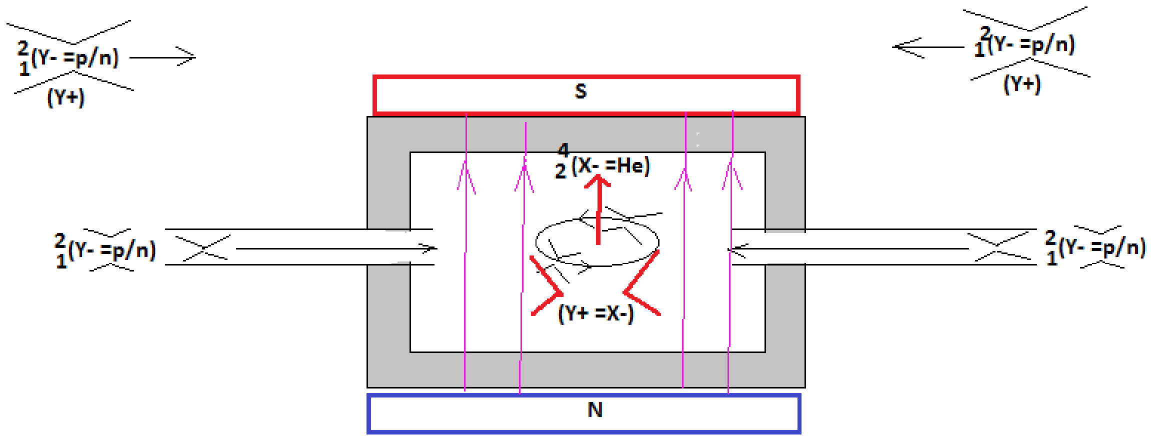
already without the antiproton. A low-energy antiproton “ejected” from such a structure structures the next and next quanta of deuterium plasma, thus forming a series of controlled thermonuclear reactions.

$${}^2_1H + p^- + {}^2_1H \rightarrow {}^4_2He + p^-$$

Today, a controlled thermonuclear reaction is created in plasma: $({}^2_1H + {}^3_1H \rightarrow {}^4_2He + {}^1_0n + 17{,}6MeV)$. They are different cores. In the space-matter $(Y-= X+)$ it is $({}^2_1H + {}^3_1H)$ similar to the connection of mass trajectories of the "positron" $(Y-= p^+/n = e^{**+})$ or $(Y-= e^+)$ and "proton" $(X+= {}^3_1H = p^{**+})$ or $(X+= p^+)$. A proton with a positron, with mutually perpendicular $(Y-)\perp(X-)$ trajectories, is hydrogen, in which everything goes to break the structure, in this case, in the plasma. And only during impacts in high-temperature plasma in the fields $(X+= p^+)$ of Strong Interaction, fields of vortex mass trajectories $(Y-= p^+/n)(Y-= p^+/n) = (X\pm= {}^4_2He)$, already a new core, as a stable structure.

More effective conditions for a controlled thermonuclear reaction appear to be counter flows of deuterium plasma with perpendicular injection of antiproton beams at the point of intersection of plasma flows. The flow of deuterium plasma itself turns out to be a controlled flow of ions, a more stable state of the plasma. Or inelastic collisions of low-energy deuterium beams, in a chamber with perpendicular lines of force of a strong magnetic field, without primary plasma. This will be already controlled “cold fusion” of helium.

модель управляемого "холодного синтеза" гелия из ядер дейтерия.



The resulting alpha particles heat the water jacket of an already controlled thermonuclear reactor. The energy yield of such structured plasma synthesis is calculated according to the standard scheme.

$$\Delta m(2[^2_1H]) = 2[(1{,}00866 + 1{,}00728) - (m_{core} = 2{,}01355)] = 0{,}00478 \text{ aem}$$

$$\Delta m([^4_2He]) = [(2 * 1{,}00866 + 2 * 1{,}00728) - (m_{core} = 4{,}0026)] = 0{,}02928 \text{ aem} .$$

$$\Delta E = \Delta m([^4_2He]) - \Delta m(2[^2_1H]) = (0{,}02928 - 0{,}00478) = (0{,}0245) * 931{,}5MeV = 22{,}82MeV$$

2 grams (one mole) of such deuterium plasma is equivalent to 25 tons of gasoline.

Plasma is not needed for tritium thermonuclear reactions. Enough inelastic collisions of high-energy protons at a ready-made collider, with tritium nuclei $^3_1H + p^+ \rightarrow \ ^4_2He$.

Theoretically, tritium without a plasma state ignites in a thermonuclear reaction due to inelastic collisions of high-energy collider protons. And already this thermonuclear reaction heats up much larger external volumes of deuterium plasma along a circular trajectory of charged deuterium ions with a further procedure for structuring counter streams of deuterium plasma with vertical streams of antiproton beams.

The second method of thermonuclear reactions without primary plasma is carried out on colliding beams of the nucleus (^2_1H) of low-energy deuterium, in inelastic collisions: $(^2_1H) + (^2_1H) = (^4_2He)$. In accordance with the equations of dynamics: $(v_Y * rot_X 2M(Y-= p^+/n) = \varepsilon_2 * \frac{\partial G(X+=^4_2He)}{\partial T})$, there must be thermonuclear fusion helium nuclei. In all cases, trial experiments are needed on the finished collider.

All the heat of the heated plasma, and this is either deuterium (^2_1H) with helium (^4_2He), or tritium (^3_1H) with helium (^4_2He), in in both cases, it is discharged into the "water jacket", with the reuse of plasma products with the removal of helium. Such a "water jacket" can be arranged together with magnets in the circuits. These plasma products are safe, environmentally friendly, and do not require any cleaning.

It is possible to use low energy antiprotons hadrons' collider, for a trial experiment, followed by the creation of controlled nuclear reactor. There are still no calculations of the primary density of deuterium plasma and antiprotons of opposite charges, which form the primary structure in the plasma. And so far there are no calculations of the necessary density of the deuterium plasma itself, which contributes to the formation of closed mass trajectories of the quanta of the Strong Interaction in the field of the Strong interaction of the antiproton , already as a helium nucleus.

Summary.

The reasons, conditions and inevitable consequences in the creation of a controlled thermonuclear reaction are indicated here . And here only a qualitative analysis of such necessary conditions is given.

Literature.

1. Mathematical encyclopedia, Moscow, "Nauka", 1975
2. (BKF) Berkeley Physics Course. V.4, "Quantum physics", Science, 1986
3. V. Pauli, "Theory of Relativity", Moscow, "Nauka", 1991
4. Landau, Lifshitz, "Theoretical physics. Quantum mechanics", v.3, "Science", 1989