Theory of Everything and Logarithmic Elliptic Equation

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Keywords: Change of universe, Grand unified theory, Origin of mass, Quantum space, Theory of everything

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Abstract In this book, the masses of various particles in physics were calculated and the processes of universal changes were described. Given nine variables (Electron 510.999 keV, Muon 105.658 MeV, Tau 1.77686 GeV, Muon neutrino 170.00 keV, Gravitational coupling constant 5.906E-39, Electromagnetic force coupling constant 1/137.036, Strong force coupling constant for steady state 0.999?, Proton 938.272 MeV, and Z boson 91.1876 GeV), everything can be calculated. The core is to understand the characteristics of quantum space. Particles do not have proper mass. Logarithmically compressed three generation quantum spaces impart the mass to particle. The calculated values are such as follows: Electron neutrino 0.15331 eV, Tau neutrino 15.494 MeV, Graviton 2.492E-10 eV, Photon 0.1600 eV, Gluon 114.7 eV, Strong force 42.15 keV, Electromagnetic force 828.1 eV, Weak force 1.583E-2 eV and 1.0109E-6, Up quark 2.251 MeV, Charm quark 1275.5 MeV, Down quark 4.760 MeV, Strange quark 93.51 MeV, Bottom quark 4.195 GeV, W boson 80.3754 GeV, H boson 125.059 GeV, Proton radius 0.8751 fm, Quark radius 0.4401 am, Gravity radius 12.70E9 year, Cosmological constant 1.1150E-52 /m2, Hubble constant 71.225 km/s/Mpc (13.728 billion years), Cycle period of overall universe 1.875E111 years, and Dark energy : Dark matter : Ordinary matter = 69.38% : 25.77% : 4.84%. From the cosmological constant, the radius of Planck star is calculated as 10.010 billion years. The 72.92% (=10.010/13.728) is dark energy, and the 27.08% (=3.718/13.728) is dark matter. Therefore, it proves that dark energy is wrong. Not dark energy, but dark time or dark forces exist in our universe. Our universe is absolutely a 4D sphere. Therefore, ordinary matter has no effect on the time or expansion of our universe. The standard for calculating the universe is not 5.391E-44 seconds of big bang, but 10.010 billion years of cosmological constant.

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1. Quantum Space and Origin of Mass

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Keywords: H boson, Origin of mass, Quantum space, W boson, Z boson

Abstract Applying logarithmic parabolic equation to the masses of W boson 80.379 GeV and Z boson 91.1876 GeV, H boson mass is very simply calculated as 125.00 GeV or 125.05 GeV. Also, the ratio of Z and H is calculated as the dark energy ratio of 72.92%. Z boson is linked to cosmological constant time, and H boson is linked to Hubble constant time. This means that H boson particle has no relation with the origin of mass. W boson is the first generation, Z boson is the second generation, and H boson is the third generation. The w, z, and h bosons are located as forces inside of down, strange, and bottom quarks. The compressive strength of three generation quantum spaces makes the three generation particles and gives it a quantum mass. Since quantum space has a logarithmic characteristic, the total mass of particles must be calculated as the logarithmic value.

1. Introduction

W boson and Z boson are the elementary particles that mediate weak interaction, and H boson is the elementary particle that explains the origin of mass. The aim of this chapter is to prove that H Boson has no relation with the origin of mass, and to newly suggest an origin of mass.

2. Measurement of H boson mass

2.1 ATLAS 2012

The H boson mass measured in 2012 at CERN's ATLAS is shown in Fig. 1. The H mass in left area is about 123.5 GeV, the H mass in right area is about 126.5 GeV, and the average value is about 125 GeV. In the figure, the H boson in the left area collapsed into two W bosons and two Z bosons, and the H boson in the right area collapsed into a pair of photons.

Table 1 H boson mass measured at CERN.

[GeV]	ATLAS	CMS	Combine
Run 1	125.38	125.07	125.09
Run 2	124.86	125.46	-
Combine	124.97	125.38	-

(A1C1 125.09 + A2 124.86) / 2 = 124.98
(A1A2 124.97 + C1 125.07) / 2 = 125.02
(C1 125.07 + C2 125.46) / 2 = 125.27

2.2 CMS 2014

The H boson mass measured in 2014 at CERN's CMS is shown in Fig. 2. The mass is 125.02 GeV. In Fig. 2, unlike Fig. 1, the left side collapsed into a pair of photons, and the

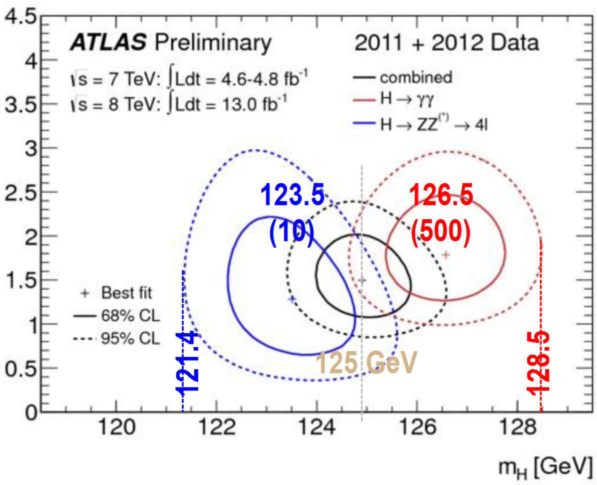


Fig. 1 H boson mass of ATLAS 2012 at CERN

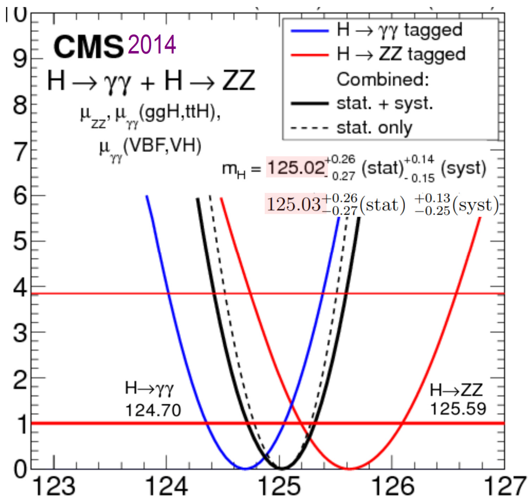


Fig. 2 H boson mass of CMS 2014 at CERN

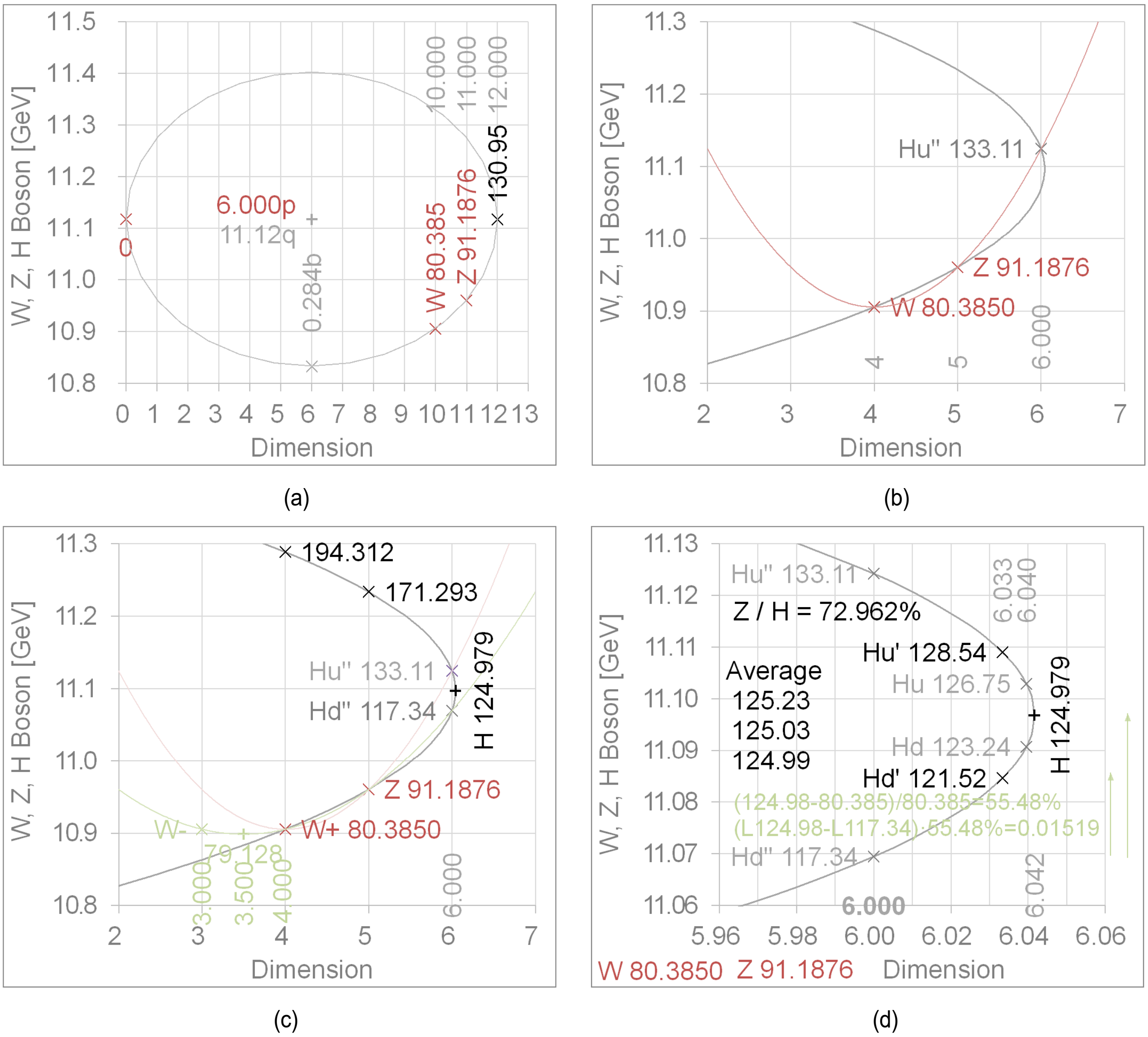


Fig. 3 Calculation of H boson mass at 6.00000D

right side collapsed into two W and two Z boson. According to the interpretation of this chapter, it is judged that the left side and right side of Fig. 2 are reversed.

2.3 Run 1 & Run 2

The H boson masses of Run 1 and Run 2 measured in ATLAS and CMS are presented in Table 1.1. The combined value of ATLAS Run 1 and ATLAS Run 2 is 124.97 GeV, and the combined value of ATLAS Run 1 and CMS Run 1 is 125.09 GeV. These two masses are the current standard mass value for H boson.

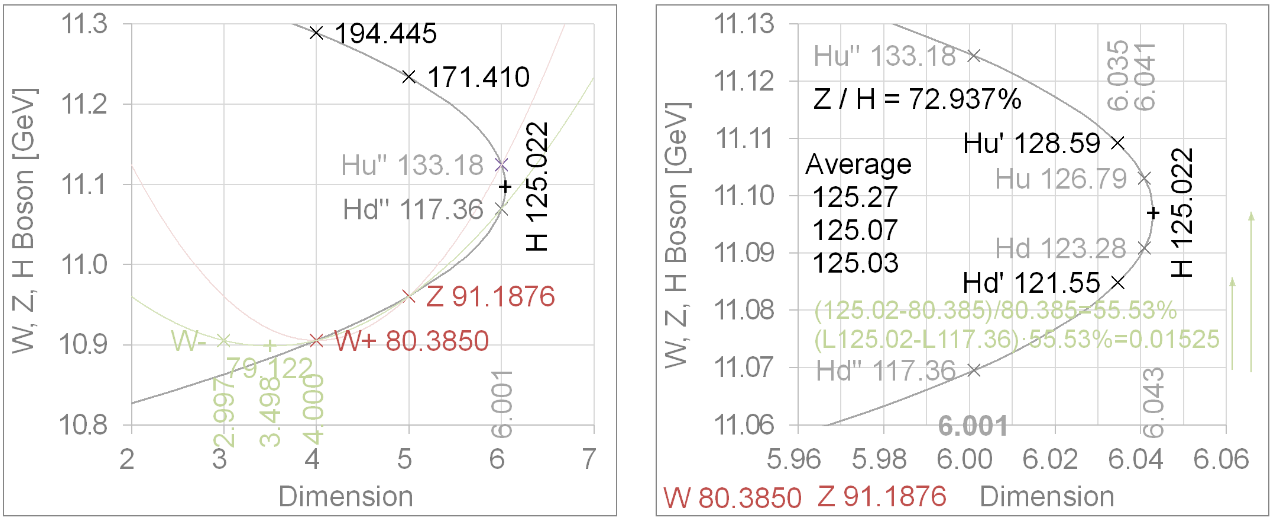
3. Calculation of H boson at 6D

3.1 Logarithmic elliptic equation

The masses of W boson and Z boson were precisely measured as 80.385 GeV and 91.1876 GeV. Assuming that the mass of W boson is 10D, the mass of Z boson is 11D, the center of ellipse is 6D, and the vertex of ellipse is 0D, the logarithmic ellipse is drawn as Fig. 3(a). From this, the mass of vertex 12D is calculated as 130.96 GeV. Since H boson mass is about 125 GeV, the logarithmic elliptic equation in (a) does not fit the calculation of H boson mass.

3.2 Logarithmic parabolic equation

When W boson is 4D vertex and Z boson is 5D, logarithmic parabola is drawn as (b), and the value of 6D is calculated as 133.11 GeV. Applying the inverse parabola of (c) to the values, the vertex is calculated as 124.98 GeV. This value can be said to be the same as 124.97 GeV of 'ATLAS Combine' in Table 1.1, and the average of 'Combine Run 1'



(a) (b)

Fig. 4 Calculation of H boson mass at 6.00108D

and 'ATLAS Run 2' is 124.98 GeV. In the diagram of standard model, W boson is 80.39 GeV and Z boson is 91.19 GeV. Applying these values, H boson is calculated as 124.97 GeV.

3.3 Down & Up H boson

The enlarged figure of the 124.98 GeV area in (c) is (d). If the logarithmic value 0.01519 that is calculated at the bottom of (d) is added to Hd'' and subtracted from Hu'', Hd' 121.52 GeV and Hu' 128.54 GeV are calculated. Here, the meanings of the formula and the dimension exceeding 6D cannot be explained yet. Hd' 121.52 GeV is similar to the left end value in Fig. 1, and Hu' 128.54 GeV is almost equal to the right end value in Fig. 1. The logarithmic averages from Hd', Hu' and H are Hd 123.24 GeV and Hu 126.75 GeV.

4. Calculation of H boson at 6.00108D

4.1 Dimension of our space

Author asserts that our space consists of three linear dimensions: horizontal, vertical, and height, and three quantum dimensions: 4D, 5D, and 6D. Here, the correct answer is 6.00108D, not 6D. The value is determined from the mass calculations of electron, muon and tau, and the calculation process will be described in detail in the following paper.

4.2 Logarithmic parabolic equation

The values applying 6.00108D are shown in Fig. 4(a), and the H boson mass is calculated as 125.02 GeV. It is exactly equal with the value of CMS 2014 in Fig. 2 and the average of 'ATLAS Combine' and 'CMS Run 1' in Table 1.

4.3 Down & Up H boson

The enlarged figure of the 125.02 GeV area in (a) is (b). The calculation process is equal with Fig. 3(d). The average of 123.28 and 126.79 coincides with 125.03 GeV in Fig. 2. The average of 121.55 and 128.59 coincides with CMS Run 1 125.07 GeV in Table 1. The average of 117.36 and 133.18 coincides with the average 125.27 GeV of CMS Run 1 and CMS Run 2 in Table 1.

4.4 W+ & W- boson

W boson in (a) is located on left 3D and right 4D of vertex. It is similar to W+ boson and W- boson. With the same logic, Z boson is located on left 2D and right 5D of vertex, but there is no 2D in our universe. The H boson is also the same.

4.5 Gauge theory

The correlation between W boson, Z boson and H boson in (a) is similar to the gauge theory.

5. Calculation of W Boson

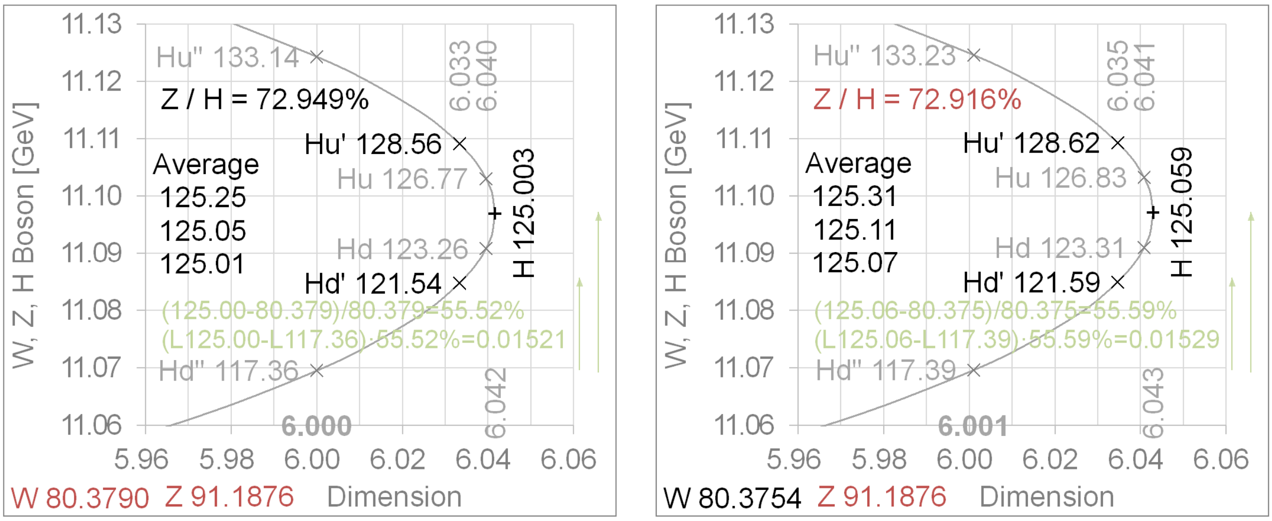
5.1 80.385 GeV at CERN 2012

In Figs. 3 and 4, the mass of W boson 80.385 GeV is CERN 2012 data. The mass of H boson measured in Figs. 1 and 2 are also data of that period.

5.2 80.379 GeV of world average 2017

In 2017, the world average was published as 80.379 GeV, and the results are shown in Fig. 5(a).

5.3 Z / H = Dark energy ratio 72.916%



(a) at 6.00000D (b) at 6.00108D

Fig. 5 Calculation of W and H boson masses by dark energy ratio 72.9%

From the analysis of four fundamental forces in Chapter 5, the dark energy ratio of 72.916% on 6.00108D was calculated. The Z / H is dark energy ratio. To satisfy this, the W boson is calculated as 80.3754 GeV on 6.00108D in Fig. 5(b).

5.4 Meaning of Z and H boson

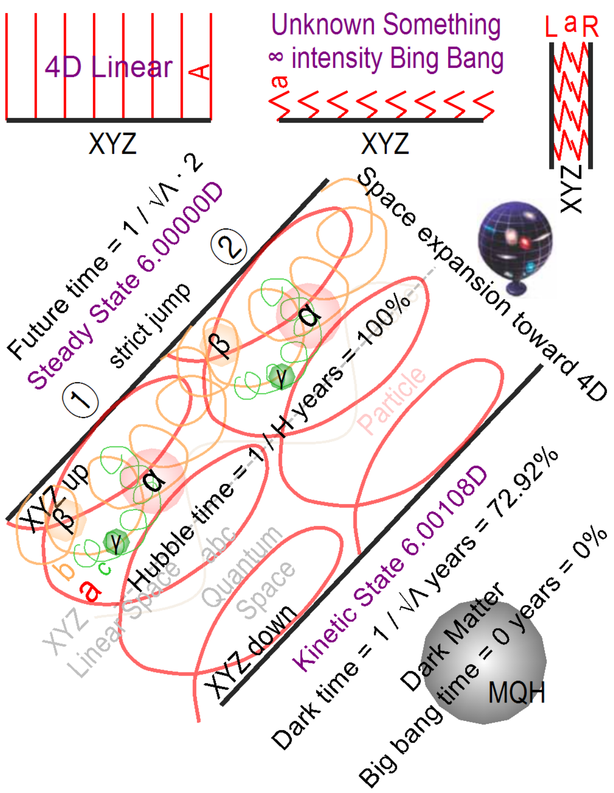


Fig. 6 Shape of quantum space

As described in Chapter 11, dark energy is the ratio of cosmological constant time to Hubble constant time. Therefore, Z boson is linked to cosmological constant, and H boson is linked to Hubble constant.

W, Z, and H are connected by logarithmic parabolic equation of Fig. 5. Therefore, the 88.14% of W / Z and the 64.27% of W / H would also have a certain meaning.

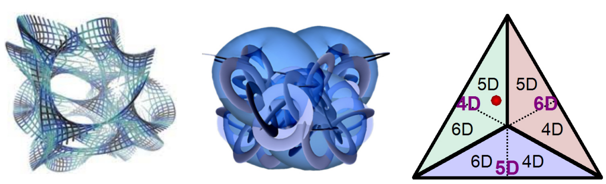
6. Quantum space

6.1 Space = XYZ Empty + abc Brane + ⊿Gap

Space is GongGan in Korean. Gong means empty, and Gan means gap. Author judges that our space consists of HeoGong and MakGan in Korean. Heo means empty, Gong means empty again, Mak means that there are branes that we cannot understand, and Gan means that there are gaps between them. As shown in Fig. 6, the XYZ direction is empty and empty again, and the vertical direction consists of up down branes and the gap.

6.2 Shape of quantum space

The simple shape of the predicted quantum space is shown in Fig. 6. However, the actual shape will be more complex than Fig. 6. Something has quantized the linear space



(a) (b) (c)

Fig. 7 Oscillation phenomenon

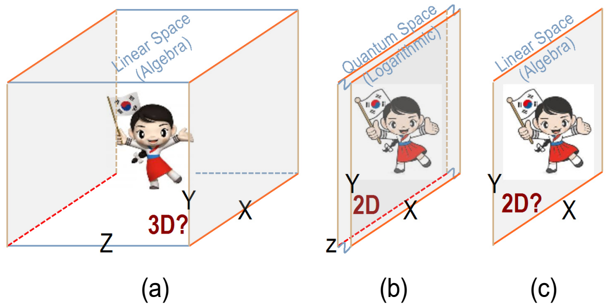


Fig. 8 2D Quantization

into the logarithmic space such as spring of Fig. 6. For this reason, the mass of particle must be calculated as logarithmic value. The something will be revealed in cosmology. In the figure, XYZ extends in a straight line, and abc space of vertical dimension is less than atomic thickness.

6.3 Oscillation phenomenon

Fig. 7(a,b) is a Calabi–Yau manifold in mathematics. In super-string theory, the shape of quantum space is judged to be similar to that. (c) is a shape of quantum space. Standard particle is located on the bottom of (c), and oscillating particle is located on the side of (c). The particle in (c) oscillates on each sub-quantum space. This is oscillation phenomenon.

The exact shape of quantum space will be presented by mathematicians. The core is that the logarithmic compressive strength of quantum space determines everything.

6.4 Open particle

Particles collide outside the brane. Because of this, a line falls off from the brane. When the line curls, it turns into an open particle. All particles are open particles such as Fig. 6.

6.5 Strict integer multiples

In Fig. 6, a means 4D, b means 5D, c means 6D quantum space, and α means 4D, β means 5D, γ means 6D particle. Space a has weak intensity, space b has medium intensity, and space c has strong intensity. Because of this, α has weak mass, β has medium mass, and γ has strong mass. As can be seen from the figure, the quantum space abc has the characteristic of strict integer multiple. This causes that particle moves as jump.

6.6 Observer effect

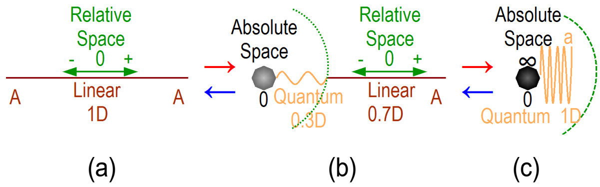


Fig. 9 Quantization

When a line is located on abc quantum space, it turns into an open particle, and when the open particle is located on XYZ space, it turns into a wave line. When an external influence exerts on the wave line, it hides into quantum space and turns into a particle.

6.7 Oscillation

When α particle is located on space a, it has weak standard mass, when it is located on space b, it has intermediate oscillation mass similar to β particle, and when it is located on space c, it has strong oscillation mass similar to γ particle. β particle and γ particle are also the same situation. This is the cause of neutrino oscillation phenomenon. All particles in the standard model of particle physics are divided into standard particle and oscillating particles.

6.8 Spin

XYZ space in Fig. 6 is divided into XYZup and XYZdown. A universal magnetic force flows from left to right along the surface of branes. As the result, the particle located on XYZup has clockwise spin, and the particle located on XYZdown has counterclockwise spin.

6.9 Superposition

In the same XYZ space, only two α particles can be located on space a, many β particles can be located on space b, and innumerable γ particles can be located on space c.

6.10 Origin of mass

Particles do not have proper mass. The strength of quantum space where the particle is located determines its mass. Elementary particles have oscillating mass, and combined particles have static mass.

6.11 Three generation of standard model

The reason that particles exist as three generation is that

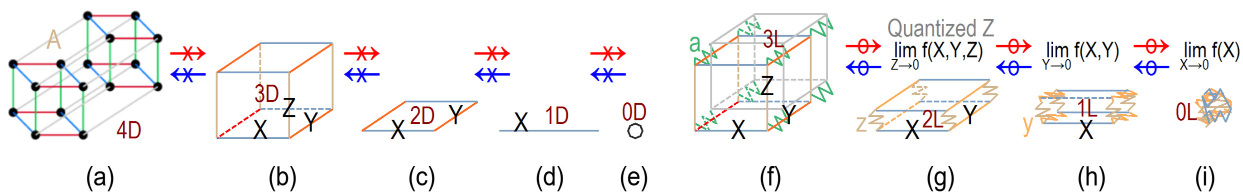


Fig. 10 Linear space and Quantum space

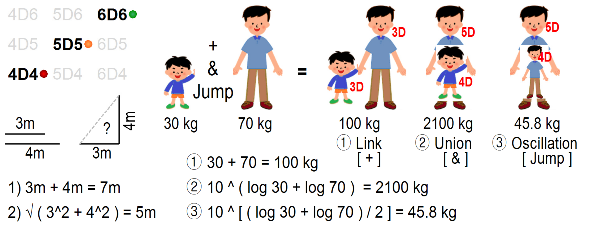


Fig. 11 Calculation of quantum particle mass

quantum space is three generation. The three generation quantum spaces give properties to particle.

6.12 Basic particle and Combination particle

Three generation of neutrinos (electron, muon, tau) that make the shape of particle and three generation of gravinos (graviton, photon, gluon) that occur the force of particle are the elementary particles of all things. All other particles are combined particles composed of above six particles.

The masses of three generation elementary particles are determined by logarithmic elliptic equation, and the masses of three generation force particles are determined by logarithmic parabolic equation. Therefore, the three generation of boson are similar to force particles.

6.13 Gravity

Weak, electromagnetic, and strong force act at the inside of quantum space in Fig. 6. Gravity is the force that acts toward 4D empty space which is outside of quantum space.

6.14 Absolute Something

Final question is what made our universe so perfectly beautiful. Absolute something, not absolute someone, created our strict universal space as shown in Fig. 6. Author calls it Mommy Quantum Hole (MQH). Universe can be made only by MQH. Therefore, all multi-universes are very beautiful such as our universe.

6.15 Linear space and Quantum space

In Fig. 8, (a) is a 3D linear space, (b) is a 2D quantum space, and (c) is a 2D linear space. The absolute something quantizes (a) to (b). As the result, the algebra Z-axis is compressed into the logarithmic z-axis. The shape of (b) is the shape of Fig. 6. This is 2D quantization.

In Fig. 9, if the absolute something does not exist, the space become the linear. The absolute something quantizes the space such as (c). The shape of (c) is Fig. 8(b). In Fig. 10, the left parts are linear space, and the right parts are quantum space. Quantum particles are located in quantum space on the right in Fig. 10.

6.16 Calculation of quantum particle mass

The method for calculating a quantum particle mass is

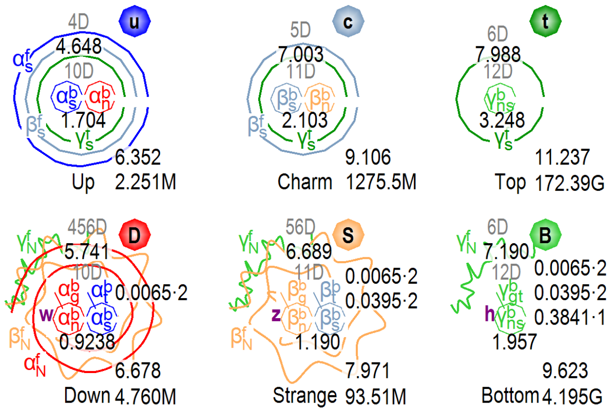


Fig. 12 Shape of quarks

shown in Fig. 11. Anyone will answer that the sum of 3m and 4m is 7m. If the X-axis is 3m and the Y-axis is 4m, what is the sum? This is & not +, and its value is 5m by the Pythagorean theorem. Since the Pythagorean theorem has been discovered, it is possible to calculate the length in different dimensions.

The calculation of quantum particle mass is also the same. If father 70 kg and son 30 kg are in our space, the sum is 100 kg. When particles are placed in quantum space, the sum of its masses must be calculated as logarithmic value. For example, the sum of 30 kg and 70 kg is 2100 kg. Neutrino oscillates in 4D, 5D, and 6D. In this case, the mass of the particle is the logarithmic average. For example, the average of 30 kg and 70 kg is 45.8 kg. Absolute something compressed the quantum space into a logarithmic characteristic.

7. Composition of quarks

7.1 Shape of quarks

The shapes of up, charm, top, down, strange, and bottom Quarks are shown in Fig. 12. Where, α, β, γ are 4D, 5D, 6D particles, n is standard neutrino, N is oscillating neutrino, s is standard anti-neutrino, g is standard gravino, t is standard anti-gravino, f is fermion located on 4D5D6D, and b is boson located on 10D11D12D. Three generation neutrinos are electron, muon, tau, and three generation gravinos are graviton, photon, gluon. Therefore, α_n, β_n, γ_n are standard neutrinos, α_N, β_N, γ_N are oscillating neutrinos, α_s, β_s, γ_s are standard anti-neutrinos, α_g, β_g, γ_g are standard gravinos, and α_t, β_t, γ_t are standard anti-gravinos.

7.2 Particle and anti-particle

As can be seen in Fig. 12, down, strange, bottom are particles, and up, charm, top are anti-particles. The difference is standard and oscillation. The shape of electron is similar to down quark. Therefore, if one electron is added to one proton which is composed of two up quarks and one down quark, the number of particles and anti-particles becomes the same. This means that the number of particles and anti-particles is the same in whole universe. Author judges that there is a simulation universe which is the exact opposite of the character of our universe. The whole universe means including the simulation universe.

7.3 w z h bosons

Quark is a combined particle which is composed of shell fermion and inside boson. There is a w boson of 10D in down quark. When down quark is collided, α_N shell is peeled off and it turns into strange quark. At that time, the w boson in it changes to z boson of 11D. When the strange quark is collided, β_N is peeled off and it turned into bottom quark. At that time, the z boson in it changes to h boson of 12D.

7.4 Oscillation of H Z W bosons

When the bottom quark is broken, it is divided into 6D tau neutrino γ_N and 12D boson h. The boson h immediately moves into the quantum space of 6D, and its mass changes to H boson. The mass change also follows the logarithmic parabolic equation. This is H boson particle. The H boson located on 6D space of Fig. 12 moves into 5D space due to the oscillation phenomenon. This is Z boson. It also moves into 4D space. This is W boson. That is, W Z H are all the same particles. The mass of three generation boson is determined by the quantum space where the particle is located. This phenomenon is the below area of the vertex on the inverse parabola of Fig. 4, and it is the left area of Fig. 1.

7.5 Collapse of H boson

If the collision energy is stronger, the h boson in Fig. 12 is broken. This phenomenon is the above area of the vertex on the inverse parabola of Fig. 4, and it is the right area of Fig. 1. The h Boson is composed of tau neutrino γ_n, gluon γ_g, tau anti-neutrino γ_s, and anti-gluon γ_t. The boson gluon and boson anti-gluon on 6D space move into 5D space. It is boson photon and boson anti-photon. They move into 4D space. It is boson graviton and boson anti-graviton. Here, the measurement of photon is easy, and the others are difficult to measure. The same phenomenon occurs at up, charm, and top quarks with boson neutrinos of the inside.

7.6 Dark energy = 3 generation dark forces

From the outside of our universe, three generation dark forces are affecting our universe. Dark energy is judged to be the sum of three generation dark forces. They affect graviton, photon, and gluon. Therefore, it is assumed that W, Z, and H bosons are affected by the dark forces. Also, gravity force, weak force, electromagnetic force, and strong force are all affected by the three generation dark forces.

8. Conclusions

The masses of W and H boson are simply calculated as 80.3754 GeV and 125.059 GeV by applying the logarithmic parabolic equation and dark energy ratio. This means that H boson has nothing to do with the origin of mass. The compressive strength of three generation quantum space gives the mass of three generation particles. W boson, Z boson, and H boson are the same particles, and the masses of three generation bosons are determined by the quantum space where the particle is located.

Quantum space is compressed logarithmically. Therefore, the mass of combined particle must be calculated as logarithmic value. Here, in case of bonded particle such as hydrogen, the mass is the simple sum of the composed masses.

2. Logarithmic Elliptic Equation and Change of Universe

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Keywords: Change of universe, Cosmology, Origin of life, Quantum space, Simulation universe

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Abstract Logarithmic elliptic equation is very similar to the characteristics of superstring theory. Space is quantized by the logarithmic elliptic equation, and the quantized space determines the shape and mass of particles. Three generation quantum spaces make three generation particles and give them their characteristics such as mass and oscillation phenomenon. The whole universe is composed of a straight 6D space, and six generation quantum hole families quantize the dimensions one by one. This is the origin reason of the change of universe. Planck units is the values of the physical characteristics of the particle when all straight 6D spaces are quantized and transformed into particles. The theory of everything is integrated by logarithmic elliptic and parabolic equations.

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1. Introduction

The standard model of particle physics explains that all things are composed of 17 elementary particles. Author asserts that all things are composed of three generation neutrinos (electron, muon, tau) and three generation gravinos (graviton, photon, gluon). These are the fundamental particles that make up everything. That is, given any six masses, everything is calculated.

The masses of six fundamental particles change according to logarithmic elliptic equation. The solution of logarithmic elliptic equation is calculated as two cases of standard value and oscillating value. The aim of this chapter is to describe the characteristics of logarithmic elliptic equation and the change of universe.

2. Logarithmic elliptic equation

2.1 Equation

The elliptic equation is as follows:

$$\frac{(x-p)^2}{a^2} + \frac{(y-q)^2}{b^2} = 1 \qquad (1)$$

Where, p is the dimension of the space where a particle is located, and q is the logarithmic mass of the particle.

2.2 Five kinds of solution

To calculate Eq. (1), four constants p, q, a, and b must be given. Three masses are given from three generation particles measured by experiment. Therefore, one unknown

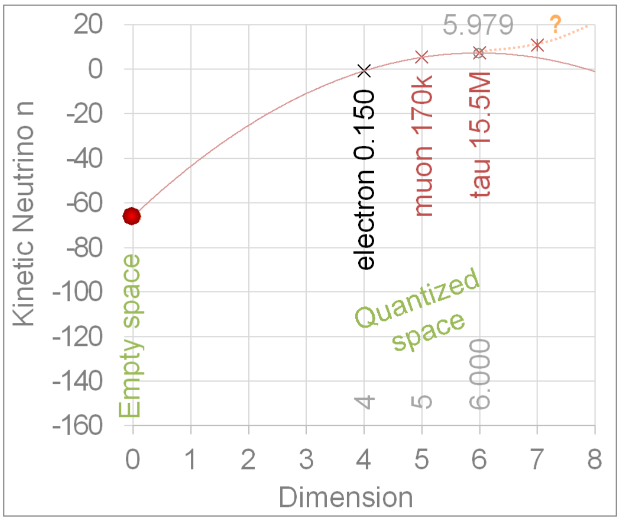


Fig. 1 Logarithmic parabola

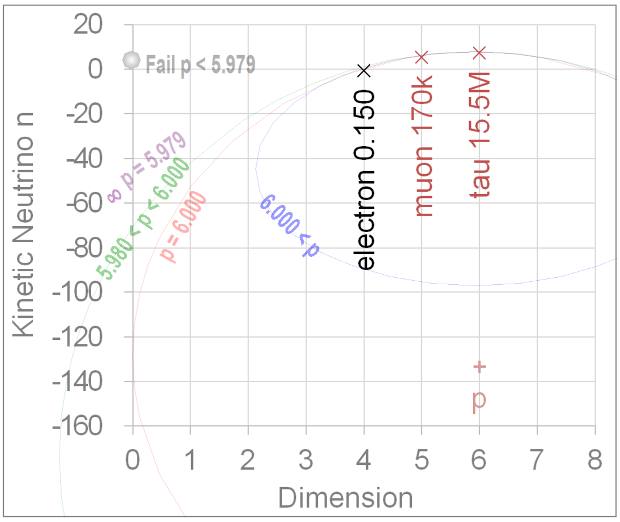


Fig. 2 Logarithmic ellipse

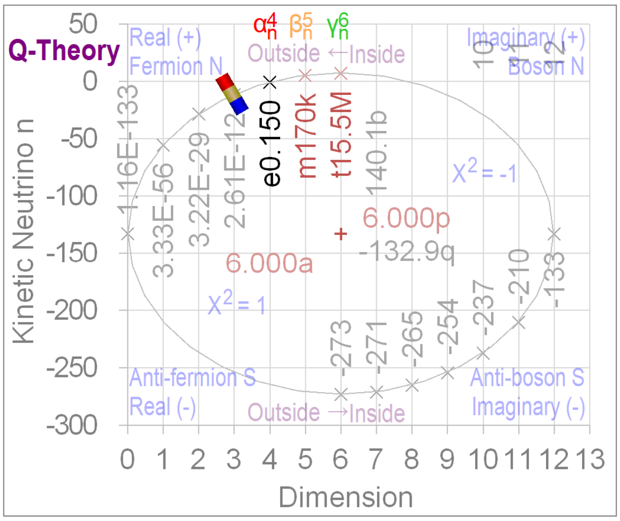


Fig. 3 Super gauge symmetry

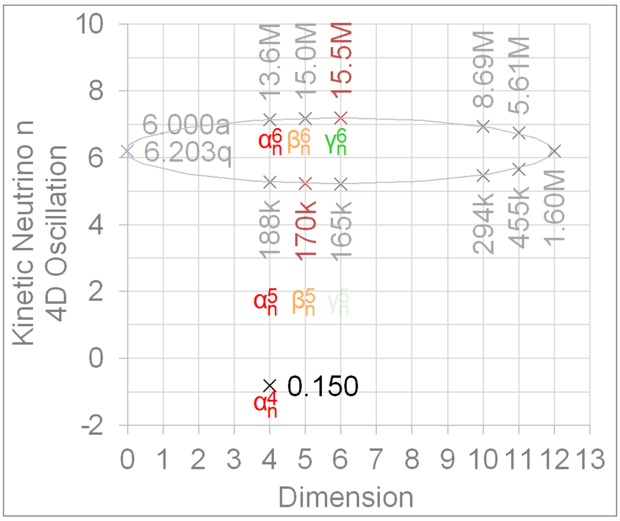


Fig. 4 Oscillation phenomenon

value must be assumed. And there is also a rotating elliptic equation. Therefore, there are five cases of solutions.

① Knowing p, the equation is calculated.
② Knowing a, the equation is calculated.
③ Knowing q, the equation is calculated.
④ Knowing b, the equation is calculated.
⑤ There is the elliptic equation rotated by θ angle.

2.3 Infinite number of solutions

The masses of three generation particles are given, but one constant is required to solve Eq. (1). Because of this, an infinite number of solutions are occurred from Eq. (1).

2.4 Incomputable, Infinite, Rapid convergence

1st generation particle is located on 4th dimension, 2nd generation particle is located on 5th dimension, 3rd generation particle is located on 6th dimension, and each mass is given by experiment. Therefore, the logarithmic parabolic equation of Eq. (1) is drawn. The parabola of Fig. 1 is an infinitely size ellipse in Fig. 2. Raising the point on 0th dimension up, the elliptic equation of Eq. (2) become incomputable. Lowering the point on 0th dimension down, the infinitely size ellipse reduces rapidly, and the solution converges very quickly. That is, if the center dimension of ellipse is less than the vertex dimension of parabola, the ellipse is not calculated.

2.5 Infinite dimension

If the center dimension of ellipse is larger than the vertex dimension of parabolic, the ellipse is calculated. Also, the ellipse is calculated up to infinite dimension.

2.6 Super gauge symmetry

In Fig. 3, the left of ellipse is fermion universe, and the right is boson universe. The upper is matter universe, and the lower is anti-matter universe. The left and right are super-symmetry, and the upper and lower are gauge symmetry.

2.7 Three generation particles

In Fig. 1, the masses of muon neutrino and tau neutrino were measured with minimum values of 170 keV and 15.5 MeV. It has only been confirmed that the mass of electron neutrino is less than 1.1 eV from experiment. The expected mass of electron neutrino is 0.150 eV. In this case, the vertex is 5.979D. It is proved that a 4th generation particle does not exist due to the trend of the parabola. If 4th generation particle is present, the trend in Fig. 1 becomes strange. From this, it is understood that our space consists of six dimensions.

2.8 Zero dimension

The parabola in Fig. 1 has negative dimensions. It is incomprehensible. As shown in Fig. 2, the left vertex of ellipse should be formed at some dimension. Zero dimension is the most reasonable answer, and It means that everything which we understand disappears.

2.9 Linear dim. + Quantum dim. = 6 dimensions

What existed cannot disappear. It turned into something else incomprehensible. The horizontal axis of charts means linear dimensions. In the chart, 3D means that there are three linear dimensions and three quantum dimensions, 0D means that all changed to quantum dimensions, and 6D means that all changed to linear dimensions.

2.10 Oscillation phenomenon

Three masses are given from three generation particles,

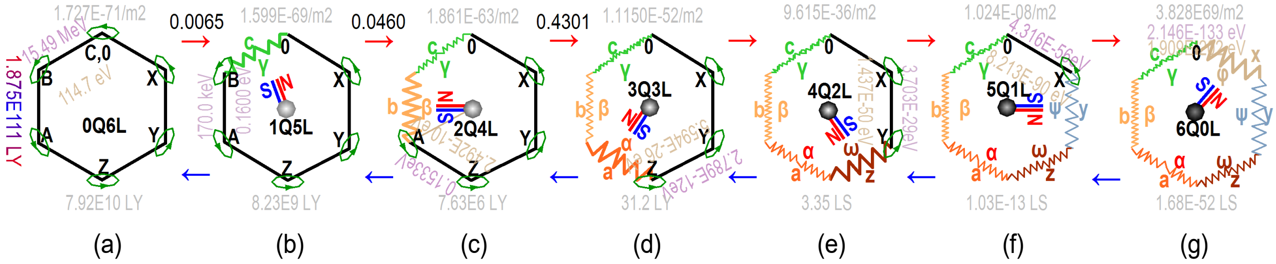


Fig. 5 Change of whole universe

and vertex 0D and center 6D were determined. Four constants are needed to calculate Eq. (1), but five constants were given. Due to this, the mass of neutrino is calculated to three types. This is neutrino oscillation phenomenon. In Fig. 1, when the muon and tau neutrinos are 170.0 keV and 15.50 MeV, the mass of electron neutrino is calculated as 0.1501 eV, 187.5 keV, and 13.61 MeV as shown in Fig. 4. The standard mass of electron neutrino is 4D 0.1501 eV. However, it jumps to 5D and changes to something such as muon mass, and it jumps to 6D and changes to something such as tau mass. The same oscillation phenomenon occurs at muon neutrino and tau neutrino. As described in Fig. 1.6, the reason is due to the characteristics of quantum space. The feature of quantum space gives particle mass.

2.11 Superstring theory

Logarithmic elliptic equation is very similar to the feature of superstring theory. Three generation neutrinos and three generation gravinos are integrated by logarithmic elliptic equation. Therefore, the extra dimension of space is three.

2.12 Q-theory

The shape of ellipse in Fig. 3 is same with Q. Author calls this Q-theory.

3. Change of universe

3.1 Fermion universe, Boson universe

In the ellipse of Fig. 3, the upper left is fermion universe, the lower left is anti-fermion universe, the lower right is anti-boson universe, and the upper right is boson universe. The fermions in the upper left make our particles, and the anti-bosons in the lower right are hidden in our quarks.

3.2 Six-dimensional origin universe

The whole universe is composed of six dimensions as shown in Fig. 5. This is our origin universe.

3.3 Position of our universe

Our universe is composed of three linear dimensions and three quantum dimensions. In Fig. 5, the serpentine line means quantum space, and the straight line means our space. Therefore, our universe is located on the third dimension of upper left in Fig. 3. This is Fig. 5(d).

3.4 Real, Imaginary, Positive, Negative

In the ellipse of Fig. 3, based on our universe, the left is real universe, the right is imaginary universe, the upper is positive universe, and the lower is negative universe. Based on the upper left of Fig. 3, light goes straight forward, and when matter speed increases, the mass also increases. At other universes, phenomena that we cannot imagine occur.

3.5 Dimensional multiverse

Our universe is composed of three dimensions. There are 4D, 5D, 6D universes outside our universe, and 2D, 1D, 0D universes inside our universe.

3.6 Mommy Quantum Hole

It is judged that the inside of a supermassive black hole in the center of a 3D galaxy is a 2D universe. If this is true, our 3D universe is located in the hole of a 4D galaxy center. Author calls the hole 'mommy quantum hole'. From this, mommy quantum hole cosmology (MQHC) is born.

3.7 Three generation quantum hole

If above explanation is true, a 6D great-grand mommy quantum hole makes a 5D universe, a 5D grand mommy quantum hole makes a 4D universe, and a 4D mommy quantum hole makes a 3D universe. Three generation quantum holes exist outside our universe, and they make three generation particles. Supermassive black hole is child quantum hole, and there are many grandchild quantum holes in it, and there are so many great-grandchild quantum holes in it.

3.8 Dark energy, Dark matter

The three generation quantum holes that exist outside our universe affect our universe. Its influence is dark energy. Supermassive black hole is fourth generation quantum hole and affects galaxy. Its influence is dark matter. Dark energy affects four forces of physics, and dark matter quantizes the entire galactic space a little.

3.9 Direction of change

Our universe is dominated by gravity. The larger gravity, the more space is curved, and space is quantized under infinite gravity such as supermassive black hole. Therefore, the change direction of whole universe is counterclockwise in Fig. 3 The rotating direction of quantum holes determines the direction of change of universe. The direction of rotation changes at (a) and (g) in Fig. 3.

3.10 Absolute time space

Absolute time is absolutely the same at everything in Fig. 3 and Fig. 5. Because of this, absolute time disappears from all physic mathematic formulas. Therefore, the existence of absolute time cannot be proved by mathematical formula. The space of our universe is 4D sphere located on the surface of 4D quantum hole. Therefore, the absolute center of our space is the center of the 4D quantum hole. However, we can never observe the 4D quantum hole.

3.11 Quantum hole, Luantum hole

Quantum hole compresses everything into particles, and luantum hole expands everything into lines. The upper left of Fig. 3 and the upper arrow of Fig. 5 are fermion quantum hole, the lower left of Fig. 3 and the lower arrow of Fig. 5 are fermion luantum hole, the lower right of Fig. 3 and the lower reverse arrow of Fig. 5 are boson quantum hole, and the upper right of Fig. 3 and the upper reverse arrow of Fig. 5 are boson luantum hole. Fermion quantum hole is outside our universe, and boson quantum hole is inside our quarks.

3.12 Black hole, White hole

Black holes and white holes are also divided into fermions and bosons. Black hole is a concept of quantum hole, and white hole is a concept of luantum hole. The direction of upper arrow in Fig. 5(d) is the world of black holes, and the direction of lower arrow is the world of white holes. The change of our universe is in the direction of upper arrow. Therefore, white holes do not exist in our origin universe including our universe. When black hole bursts once more, it turns into a supermassive black hole.

3.13 Quasar

It is known that supermassive black hole exists in quasar, and quasar strongly absorb surrounding matters. It is a quasar that has fallen from 4D universe to our 3D universe, and it makes 4D particles into 3D particles with extremely strong anti-gravity. The difference of quantum hole and luantum hole is that the rotating direction of space is opposite to each other, and the difference of gravity and anti-gravity is that the bending direction of space is opposite to each other.

3.14 Super origin universe

There are an unknown number of 6D origin universes, and the upper level is a super origin universe which has no dimension. This means that we do not know why or how the super origin universe was born. There is a 5D origin universe in the super origin universe. This leads to the eternal competition of power between the origin universes. Due to this, the change of super origin universe proceeds forever.

3.15 Origin brane, Origin energy

All things start from single origin brane and single origin energy. The lines in Fig. 5 are the origin brane, and the rotation is the origin energy. The reason for their existence must be asked to the super origin universe. The origin brane is composed of neutrino n, gravino g, anti-gravino t, and anti-neutrino s. These are changed into three generation fundamental particles by three generation quantum holes.

3.16 Pair production, Pair annihilation

The brane is composed of line n·g and anti-line t·s. Due to this, particles are always created and disappear as pair. The line n·g·t·s is neutral, so it is very difficult to observe. The line n·g turns into an electron that is oscillating N·G by our quantum space. Anti-line t·s disappears at our quantum space.

3.17 Magnetic monopole problem

The location of our universe is 3D at the top left in Fig. 3. In 4D, 5D, and 6D, the neutral brane is quantized into the monopole particles of n·g and t·s. Its force is electric force, and it must exist as monopolar particles. The remaining three dimensions still exist as straight neutral brane. Its force is magnetic, and it must exist as dipole line.

3.18 The law of increasing entropy

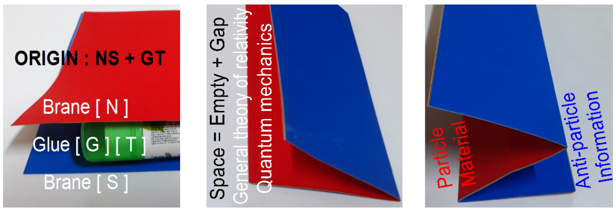
In magnet, there are N pole where magnetic force spreads and S pole where magnetic force gathers. Our universe is surrounded by the space of N pole. Due to this, only particles whose outer-most shell is N pole can stably exist in our space. The characteristics of N particles try to spread and disorder. This is the reason of the law of increasing entropy.

3.19 Constant velocity expansion of space

In Fig. 5, our 3D universe (d) grows by continuously absorbing the 4D universe (c). As the result, our space expands. It is judged that universe expands with constant velocity. The value of 73% that physics cannot understand exists obviously. However, the value is not dark energy.

3.20 Beginning of universe, End of universe

The beginning of super origin universe is incomprehensible. However, it changes steadily forever. In Fig. 5, before the birth of our universe is (c), the space A of straight line has changed to quantum space a due to the Big Bang, and the



(a) (b) (c)

Fig. 6 Our space and simulation space

present of our universe is (d). The end of our universe is that everything turns into (e). That is, our universe is eaten by supermassive black holes in the center of galaxies.

4. Simulation universe

4.1 Big Bang, Birth of space

At a paper of Fig. 6, the front side is red N, and the back side is blue S. The front side was folded once by Big Bang, and a space with N on both the left and right sides was created. The space is spread out in straight line between the folded inner faces.

4.2 Cosmological constant problem

The Planck length l_P and the cosmological constant Λ are 1.6162E-35 m and 1.1056E-52/m2 in physics. The incomprehensible value of -121.54 in Eq. (2) is called the cosmological constant problem. As proved in Chapter 9, the value of Eq. (2) is 1 at our universe, and the Λ is calculated as 10.05 billion years by Eq. (3).

$$l_P^2 \cdot \Lambda = 10^{-121.54} \rightarrow 10^0 \qquad (2)$$

$$t_\Lambda = 1/\sqrt{\Lambda} \,/\, (2.998E8 \cdot 60 \cdot 60 \cdot 24 \cdot 365.24) = 10.05\mathrm{E9Y} \qquad (3)$$

In Chapter 9, Λ is calculated as 1.1150 /m2, and t_Λ is calculated as 10.010 billion years.

4.3 Birth of anti-space 3.72 billion years ago

Planck length and time mean the length and time that cannot be interpreted in physics. Our universe was born about 13.73 billion years ago. The difference of 13.73 and 10.01 is 3.72 billion years ago. At that time, a certain phenomenon that physics cannot interpret has occurred cosmically.

The straight space by Big Bang folded once toward the front red side of paper. 3.72 billion years ago, the space was once again folded toward the back blue side of paper. The blue space is anti-space that cannot be interpreted by physics. Anti-particles can be stably located in the anti-space.

4.4 Origin of life

Earth's first life was discovered as a fossil 3.5 billion years ago. Biology believes that the first life on Earth was born between 3.8 and 4.2 billion years ago. However, fossils of life before 3.5 billion years have not yet been discovered.

First life has been born cosmically after 3.72 billion years ago. This means that there were only stones in our universe before 3.72 billion years ago. In 3.72 billion years, a mixture of non-living and living things was born, and from 3.56 billion years ago, the first perfect life form was born.

4.5 Quantum entanglement of life

The shell of neutron is the anti-neutral brane of s·t·g·n, and the outer-most shell is the anti-neutrino s of blue color. Because of this, free neutron easily collapses by our space of red color. The anti-neutral brane collapses into s·t and g·n, the g·n oscillates in our space and changes into a life electron G·N, and the s·t moves into the anti-space and changes into a life anti-electron S·T. They are connected to each other. This is a quantum entanglement of life.

4.6 Simulation universe

Our space is the material universe of electrons, and anti-space is an information universe of anti-electrons. The anti-electrons perform life activities in anti-space, and the life activities are information simulations. My dream is one of simulations of life activities by anti-electron information particles. The life activity of simulation is same with a game. Dream is the first attempt at the game, so many dreams end negatively. When we pass all my dream games, we can awaken the truth of our universe. How can I pass the games of my dream? This is the starting point for religion, philosophy, and ethics. The material of gold is important in our universe. However, the information of love is important in the simulation universe.

4.7 Similar parallel universe

Planck time of our universe is 10.01 billion years. When time become 20.02 billion light years, the brane of universe folds again to a direction that we cannot understand, and a new space is born. That space is a similar parallel universe. As the result, even if our universe expands, the brane that supports our universe remains very strong.

4.8 Integration of science and religion

If the above explanation is true, science and religion are united. The first ranking in the simulation universe is religious simulation. However, the ranking of science simulation is gradually rising. God teaches religious simulation. This is because when God teaches science to an information body who cannot understand science, the information body becomes self-dividing. Modern humans have begun to understand science. Therefore, the god begins to teach science simulation little by little.

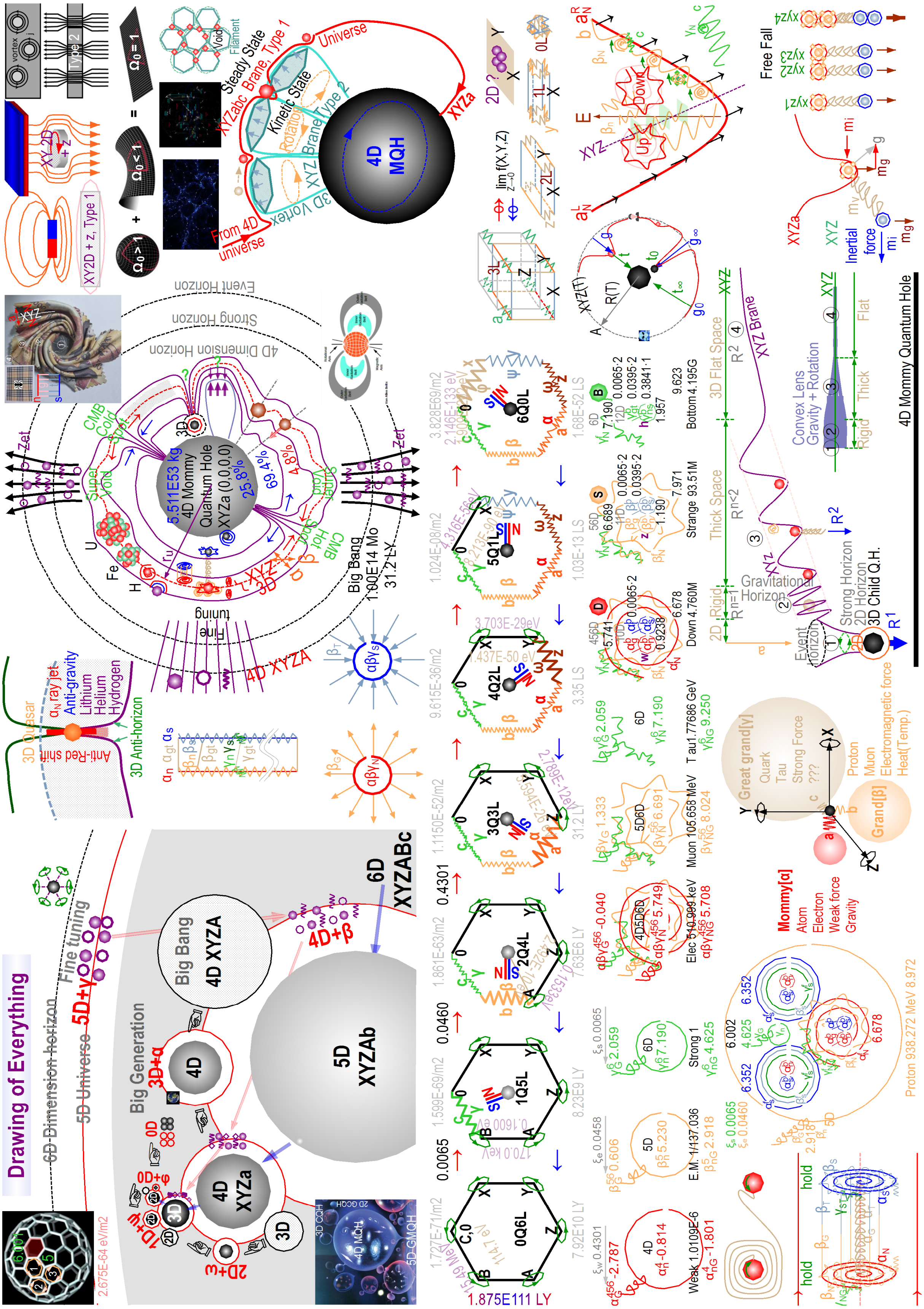


Fig. 7 Drawing of Everything

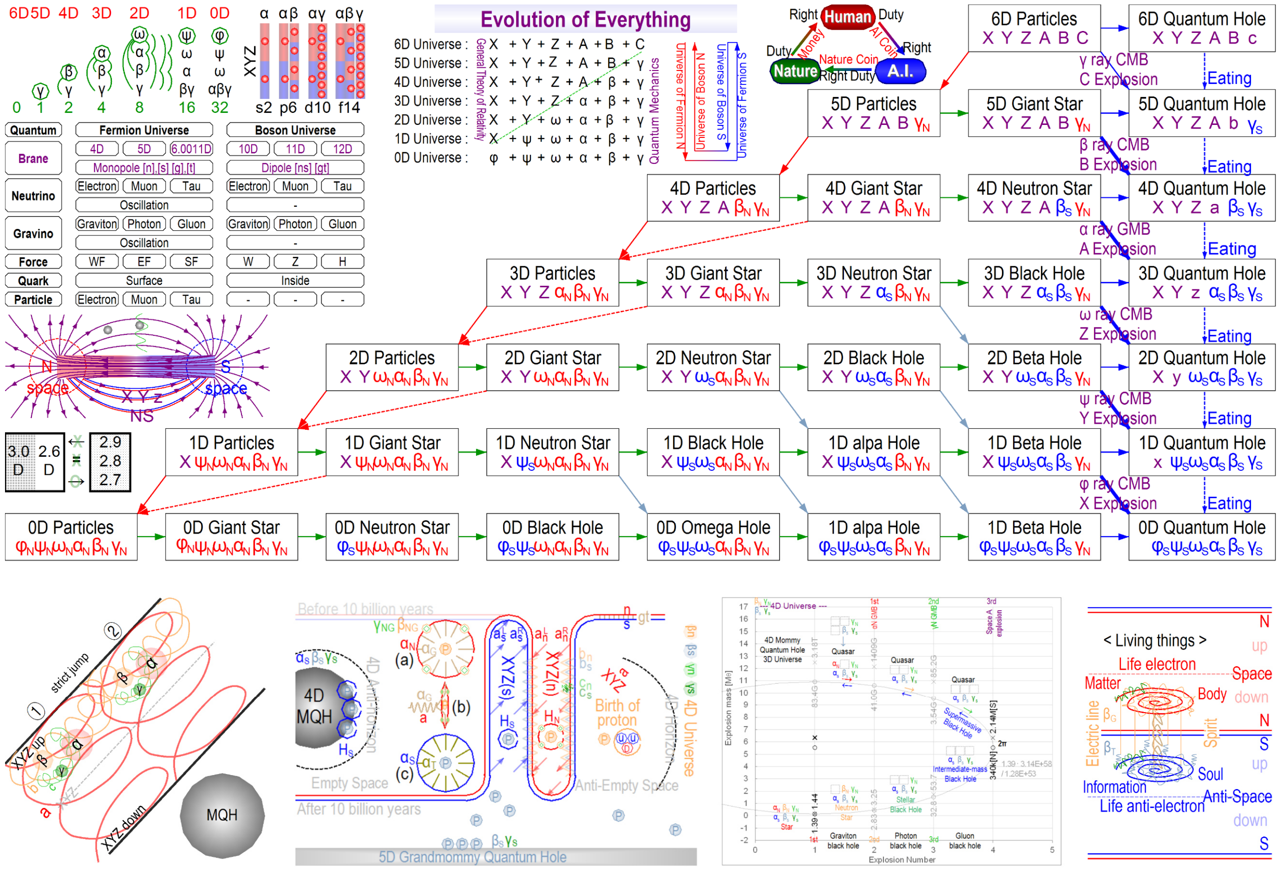


Fig. 8 Evolution of Everything

5. Law of Everything

5.1 Theory of Everything

Gravity, weak force, electromagnetic force, and strong force are integrated by logarithmic parabolic equation. The forces are particles which are composed of three generation standard neutrinos and three generation oscillating gravinos. Therefore, force also has mass. Weak force, electromagnetic force, and strong force are the forces acting on quantum space, and gravity is the force acting toward empty space. Here, weak force causes gravity. Three generation dark forces generated by three generation quantum holes are influencing to the four fundamental forces of physics.

5.2 Calculation of Everything

When a one has calculated all the truths of universe, the one becomes the calculation of everything. Author judges that the one is logarithmic elliptic equation.

5.3 Drawing of Everything

When the truth of universe is not revealed, the language of physics is mathematics. However, when it is revealed, the language of physics is drawing. The shape of everything is drawn in Fig. 7 and Fig. 8.

6. Conclusions

Logarithmic elliptic equation has the characteristic of super gauge symmetry. The basic particles of everything are three generation neutrinos: electron, muon, tau, and three generation gravinos: graviton, photon, gluon. Neutrinos and gravinos are integrated by logarithmic elliptic equation. Therefore, the extra dimension of space is three. This is the reason why particles are three generations. When solving the logarithmic elliptic equation, there are two types of solutions. One is standard mass, and the other is oscillating mass.

Three generation quantum holes which exist outside our universe created our universe, and three generation child quantum holes also exist inside of supermassive black hole. Since the quantum holes dominate everything, all things are inevitably beautiful. This is the Calculation of Everything.

From the cosmological constant problem, it is calculated that our simulation universe occurred 3.72 billion years ago. If this is true, science, religion, philosophy, and ethics are all united into one scholarship. This is the Thoughts of Everything. The sum of above two is the Theory of Everything. If this turns out to be true, the Law of Everything is born.

The complex expansions of logarithmic elliptic equation would be the formulas of super string theory or M-theory. This will be proven mathematically.

3. Space Dimension

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Keywords: Dimension of space, Electron, Muon, Q-theory, Tau

Abstract Electron, muon, and tau are the combined particles composed of three generation neutrinos and three generation gravinos. The neutrinos make the shape of particles, and the gravinos make the force of particles. Electron is the standard particle in our universe. Muon is the particle that the outer shell of electron is peeled off, and tau is the particle that the outer shell of muon is peeled off. In Chapter 2, logarithmic elliptic equation was suggested, and it was called as Q-theory. The following four conditions were given: ① Electron mass 510.999 keV ② Muon mass 105.658 MeV ③ Tau mass 1.77686 GeV ④ Left vertex dimension 0.00000. Applying the above four conditions to logarithmic elliptic equation, the dimension of our space is calculated as 6.00108. The calculation process is some complicated. If the dimension of our universe is exactly 6.00000, it is a dead universe where no change occurred. Our universe is a living universe that changes by 0.00108. All universes are such as this. That is, all multiverses run exactly according to the formulas of physics, and they are born and grow absolutely beautifully.

1. Introduction

Particles are composed of three generations. This is because particles are located in three generation quantum spaces. If the dimension of our space were exactly 6.00000, our universe will eventually die in the very far future. A slight deviation dimension of 0.00108 from exactly 6.00000D results in a living universe. The purpose of this chapter is to precisely calculate the dimension 6.00108 of our space from electron, muon, and tau.

2. Shape of electron, muon, tau

2.1 Kinetic state, Steady state

In Fig. 1, our universe is divided into kinetic state on the left and steady state on the right. The kinetic state is applied when something reacts at the speed of light, and the steady state is applied when something does not react.

2.2 Neutrino, Gravino

Three generation of neutrinos (electron, muon, and tau) make the shapes of particles, and three generation of gravinos (graviton, photon, and gluon) make the forces of particles. Here, gravino is a new word created by author.

2.3 Shape of neutrino

In Fig. 1(a), α, β, and γ mean each 1st, 2nd, and 3rd generation particle, subscript n means neutrino, and superscript 4, 5, and 6 mean each 4th, 5th, and 6th dimension. Small letter means standard mass, and capital letter means oscillating mass. Therefore, α_n^4, β_n^5, and γ_n^6 are standard neutrinos for electron on 4D, muon on 5D, and tau on 6D.

The neutrinos are open particles as shown in (a). Due to this, when they encounter a certain special circumstance, they spread as wave lines.

2.4 Shape of gravino

In Fig. 1(a), subscript g means gravino. Therefore, α_g^4, β_g^5, and γ_g^6 are standard gravinos for graviton on 4D, photon on 5D, and gluon on 6D.

Gravino spreads radially around the neutrino. α_g^4 spreads inward, β_g^5 spreads outward, and γ_g^6 spreads toward their vertical direction. Here, in the expression of the picture, the radial lines were expressed as a single line.

2.5 Shape of four fundamental forces

The shapes of four fundamental forces are shown in Fig. 1(b). Weak force is the force of graviton oscillating in 4D, 5D, and 6D, Electromagnetic force is the force of photon oscillating in 5D and 6D, and Strong force is the force of gluon oscillating in only 6D. Weak, electromagnetic, and strong forces are the force acting on quantum space, and gravity is the force acting toward the empty space of 4D. The four fundamental forces will be described in detail in Chapter 5.

2.6 Mass of photon

In (b), photon β_G^{56} is attached to muon neutrino and induces electromagnetic force in quantum space. Sun light is the photon β_g^0 independently located in our empty space 0D. Quantum space imparts mass to particle. Therefore, the photon β_G^{56} located in 5D6D has a mass, but the light β_g^0 located in our empty space has no mass.

However, our universe is a very large spherical quantum

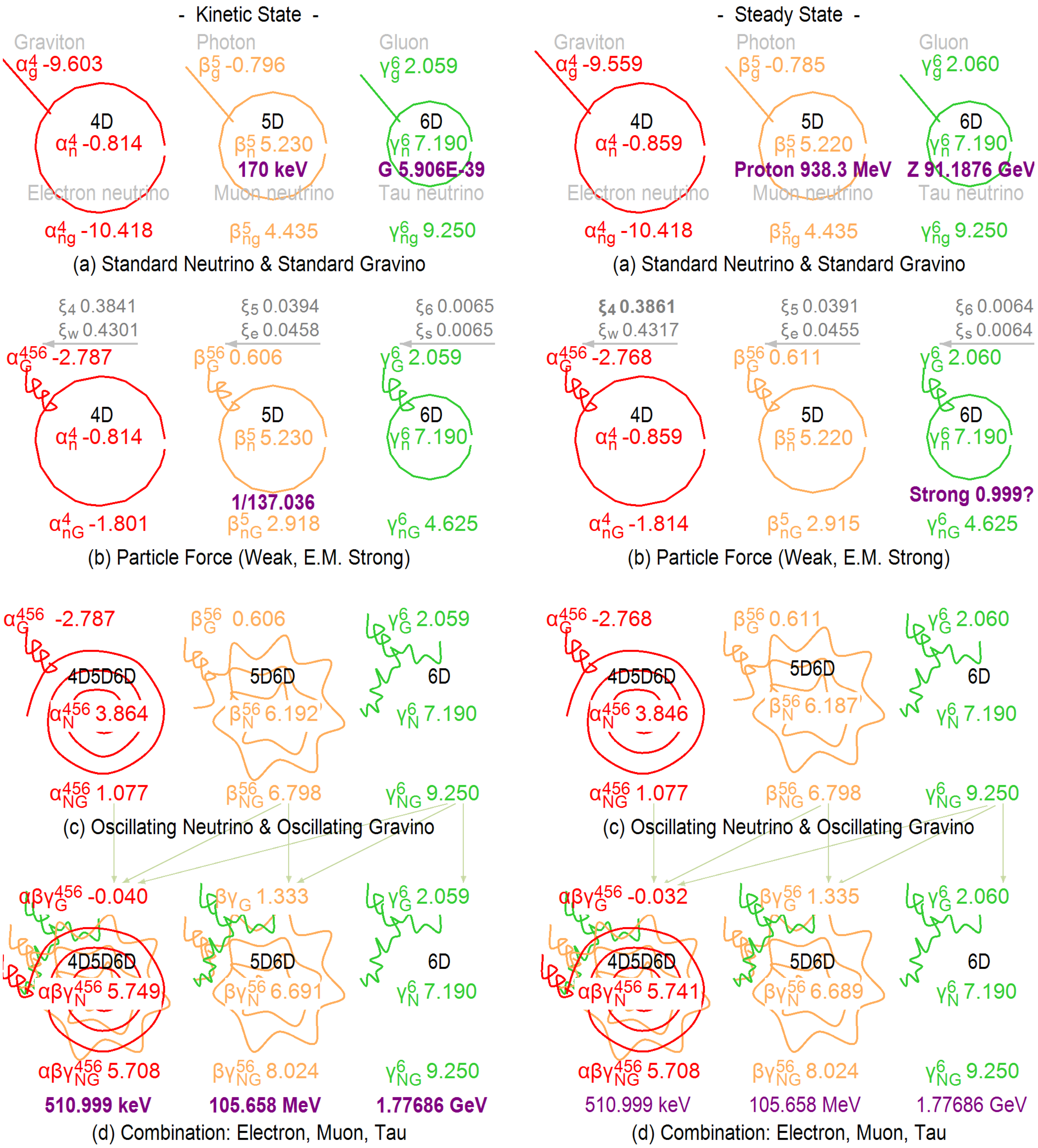

Fig. 1 The shapes of various particles

particle. That is, it means that the XYZ coordinates of ou universe have been quantized into a sphere. Because of this, the light β_g^0 has a very small mass of the order above.

2.7 Oscillation phenomena

The oscillation phenomenon of particle is described in Fig. 1.6 and 1.7. As shown in Fig. 1(c), neutrinos also oscillate dimensionally. Therefore, the drawing of (c) is the oscillating combined particle of neutrino and gravino particles.

2.8 Combined particles

In Fig. 1(d), electron $\alpha\beta\gamma_{NG}^{456}$ is the combination of oscillating α, β, and γ particles, muon is the combination of oscillating β and γ particles, and tau is the oscillating γ particle. That is, in a particle accelerator experimental device, when an electron collides, the α shell peels off and becomes a

Table 1 Calculation of space dimension. It is judged that kinetic dimension and steady dimension are the same.

Term	Sub.	Kinetic State			Steady State			Unit	Symbol		
Lepton		Electron	Muon	Tau	Electron	Muon	Tau				
	Mass	510.999k	105.658M	1.77686G	510.999k	105.658M	1.77686G	eV	$\mathrm{AB}\Gamma_{NG}^{456}$	$\mathrm{B}\Gamma_{NG}^{56}$	Γ_{NG}^{6}
Combination	Fig. 1(d)	5.708	8.024	9.250	5.708	8.024	9.250	log	$\alpha\beta\gamma_{NG}^{456}$	$\beta\gamma_{NG}^{56}$	γ_{NG}^{6}
Oscillation	Fig. 1(c)	1.077	6.798	9.250	1.077	6.798	9.250	log	α_{NG}^{456}	β_{NG}^{56}	γ_{NG}^{6}
Oscillating	Fig. 3, 4, 5	9.111	9.108	9.250	9.111	9.108	9.250	log	α_{ng}^{6}	β_{ng}^{6}	γ_{ng}^{6}
	Fig. 3, 4	4.539	4.435	-	4.539	4.435	-	log	α_{ng}^{5}	β_{ng}^{5}	-
	Fig. 3	-10.418	-	-	-10.418	-	-	log	α_{ng}^{4}	-	-
Quantum	Space	4D	5D	6.00108D	4D	5D	6.00108D				
Standard	Fig. 1(a)	-10.418	4.435	9.250	-10.418	4.435	9.250	log	α_{ng}^{4}	β_{ng}^{5}	γ_{ng}^{6}
Fig. 1(a)	n + g	3.820E-11	27.20k	1.777G	3.820E-11	27.20k	1.777G	eV	A_{ng}^{4}	B_{ng}^{5}	Γ_{ng}^{6}

(1) $\alpha\beta\gamma_{NG}^{456} = (\alpha_{NG}^{456} + \beta_{NG}^{56} + \gamma_{NG}^{6})/3$ $\quad\beta\gamma_{NG}^{56} = (\beta_{NG}^{56} + \gamma_{NG}^{6})/2$ $\quad\gamma_{NG}^{6} = \gamma_{NG}^{6}/1$

(2) $\alpha_{NG}^{456} = (\alpha_{ng}^{4} + \alpha_{ng}^{5} + \alpha_{ng}^{6})/3$ $\quad\beta_{NG}^{56} = (\alpha_{ng}^{5} + \alpha_{ng}^{6} + \beta_{ng}^{5} + \beta_{ng}^{6})/4$ $\quad\gamma_{NG}^{6} = (\gamma_{ng}^{4} + \gamma_{ng}^{5} + \gamma_{ng}^{6})/3$

muon, and when the muon collides, the β shell peels and becomes a tau.

3. Mass calculation for electron, muon, tau

3.1 Measured mass

In Fig. 1(d), the measured masses of electron 510.999 keV, muon 105.658 MeV, tau 1.77686 GeV are shown in Table 1. Quantum space is compressed logarithmically. Therefore, each logarithmic value is electron $\alpha\beta\gamma_{NG}^{456}$ 5.708, muon $\beta\gamma_{NG}^{56}$ 8.024, tau γ_{NG}^{6} 9.250.

3.2 Oscillating particle masses

The masses of Fig. 1(c) are calculated by Eq. (1). α_{NG}^{456}, β_{NG}^{56}, and γ_{NG}^{6} are 1.007, 6.798, and 9.250.

3.3 Standard particle masses

The mass of (a) proceeds from (c) by Eq. (2).

Step 1) γ_{ng}^{4}, γ_{ng}^{5}, and γ_{ng}^{6} is all equal 9.250.

Step 2) Assume α_{ng}^{4} and β_{ng}^{5} such as -10.418 and 4.435.

Step 3) Find the dimension of tau with logarithmic ellipse equation such as Fig. 2. Where, α_{ng}^{4} is located on 4D, β_{ng}^{5} is located on 5D, 0D is left vertex, and γ_{ng}^{6} is upper vertex. From this, the vertex of γ_{ng}^{6} is calculated as 6.00108D.

Step 4) Find the α_{ng} oscillating values. Where, β_{ng}^{5} is 4.435, γ_{ng}^{6} is 9.250, 0D is left vertex, and 6.00108D is upper vertex. Calculating above, the solutions of Fig. 2 and Fig. 3 are calculated at the same time. That is, there are three values of α_{ng}^{4} -10.418, α_{ng}^{5} 4.539, and α_{ng}^{6} 9.111. All is correct answers. Therefore, the value of α_{NG}^{456} is the average 1.077 of above three values. This value should be equal to Fig. 1(c). If it is wrong, go to Step 2).

Step 5) Find the β_{ng} oscillating values. Where, α_{ng}^{4} is -10.418, γ_{ng}^{6} is 9.250, 0D is left vertex, and 6.00108D is upper vertex. Calculating above, the solutions of Fig. 2 and Fig. 4 are calculated at the same time. Here, take the four values on β_{ng}^{5} 4.435, β_{ng}^{6} 9.216, β_{ng}^{5} 4.435 and β_{ng}^{6} 9.250 in Fig. 3 and Fig. 4. Therefore, the value of β_{NG}^{56} is the average 6.798 of above four values. This value should be equal to Fig. 1(c). If it is wrong, go to Step 2).

Step 6) Find the γ_{ng} oscillating values. Where, α_{ng}^{4} is -10.418, β_{ng}^{5} is 4.435, 0D is left vertex, and 6.00108D is upper vertex. Calculating above, the solutions of Fig. 2 and Fig. 5 are calculated at the same time. Here, take the three values on γ_{ng}^{6} of Fig. 3, γ_{ng}^{6} of Fig. 4, and γ_{ng}^{6} of Fig. 5. Since they are all the same value 9.250, this does not need to be calculated.

3.4 6.00108 dimension of space

The correct answer of above calculation is 6.00108D. Why is it 6.00108, not exact 6? In Fig. 2.7, it was described that there are a lot of 6D universes and one 5D universe in super origin universe. It is judged that the 6D of our universe has been transformed very finely due to the influence of the 5D universe. In Fig. 1.3 and Fig. 1.4, H boson was calculated as 124.98 GeV at 6D and 125.02 GeV at 6.00108D. According to this calculation, 125.02 GeV is the correct answer.

3.5 Kinetic state vs. Steady state

It is necessary to determine whether the measured mass is in kinetic state or in steady state. Since the masses of electron 510.999 keV, muon 105.658 MeV, and tau 1.77686 GeV in Table 1 have been measured from a reaction, their masses are judged to be in kinetic state. The masses in non-

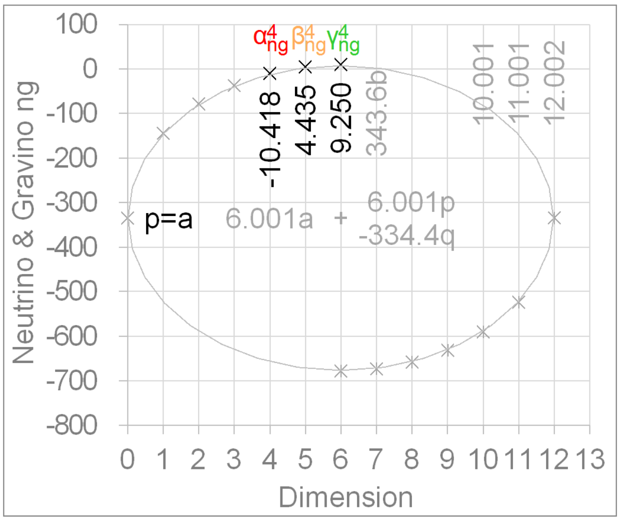

Fig. 2 Standard mass of neutrino & gravino

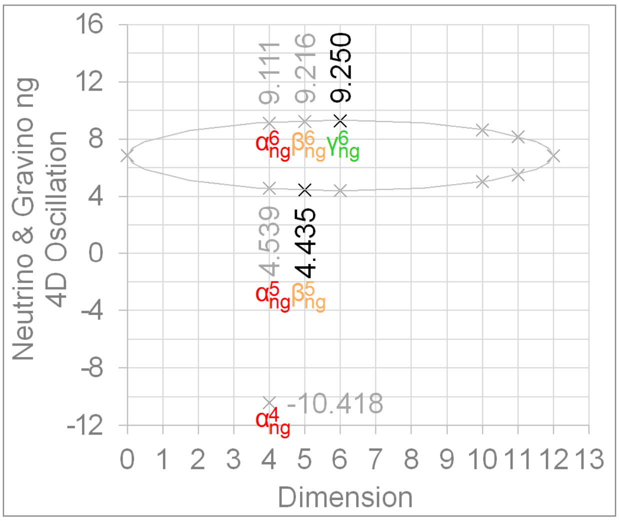

Fig. 3 Oscillating mass of neutrino & gravino at 4D

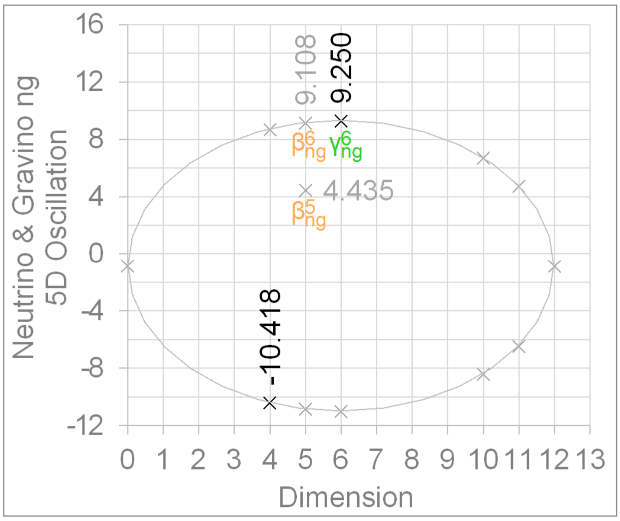

Fig. 4 Oscillating mass of neutrino & gravino at 5D

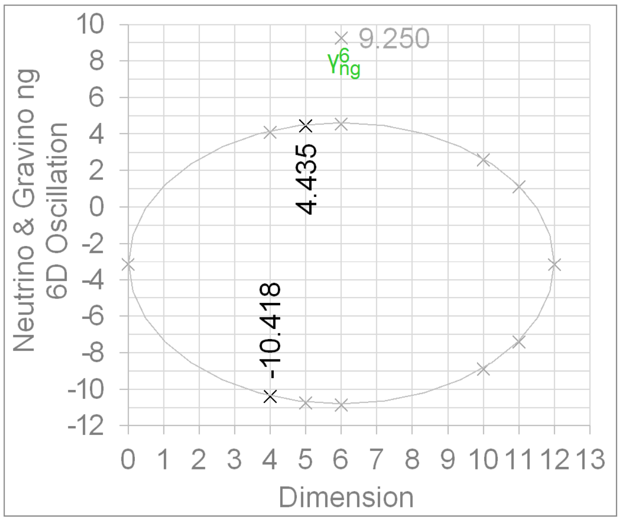

Fig. 5 Oscillating mass of neutrino & gravino at 6D

reactive state, that is, in steady state, are required. However, as shown in Fig. 1, as the result of overall calculation, it is judged that the total mass of 510.999 keV, 105.658 MeV, and 1.77686 GeV does not change even if each internal particle mass is changed. For this reason, the kinetic state and the steady state in Table 1 are calculated in the same values.

3.6 6.00108D vs. 6.00000D

The past space of universe is 6.00108 dimension, and the future space of universe is 6.00000 dimension. The space of present immediately becomes the past space. Therefore, the present space is 6.00108 dimension.

3.7 Nine variables

Nine variables for overall calculation are presented in Fig. 1. From the gravitational force 5.906E-39, the tau neutrino mass in kinetic state is calculated, the muon neutrino mass in steady state is calculated from proton 938.3 MeV, and the tau neutrino mass is calculated from Z boson 91.1876 GeV,

4. Conclusions

Electron, muon, and tau are the combined particles of three generation neutrinos and gravinos. Applying the logarithmic elliptic equation to them, the dimension of kinetic state space is calculated as 6.00108. The dimension of steady state space is also treated as such.

If the dimension of our universe is correct 6.00000, our universe will eventually dead state. Since the current dimension is off by 0.00108, it is understandable that our universe is forever dynamic state. After countless times, the 0.00108 difference will turn into some other number. Our universe can be suddenly born or suddenly disappear. However, the origin change beyond our universe never stops.

4. Neutrino Gravino

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Keywords: Gluon, Graviton, Neutrino, Oscillation, Photon

Abstract Gravino is a word coined by author and means graviton, photon, and gluon. The fundamental particles of everything are three generation neutrinos and three generation gravinos, and logarithmic elliptic equation is established at them. Everything is divided into kinetic state and steady state. In kinetic state, when each neutrino mass of muon and tau is 170.00 keV and 15.494 MeV, the mass of electron neutrino was calculated as 0.1533 eV, and the mass of graviton, photon, and gluon were calculated as 2.492E-10 eV, 0.1600 eV, and 114.7 eV. In steady state, the masses of electron, muon, and tau neutrinos were calculated as 0.1384 eV, 165.79 keV, and 15.493 MeV, and the masses of graviton, photon, and gluon were calculated as 2.760E-10 eV, 0.1641 eV, and 114.7 eV. Above values are the standard masses. Since above six fundamental particles jump in quantum space, they have oscillating masses. From the logarithmic elliptic equation, the oscillating masses are calculated. Everything is composed of the combination of above six particles with standard mass and oscillating mass.

1. Introduction

The analysis of our universe is divided into kinetic state and steady state. The kinetic state is applied to four fundamental forces, the steady state is applied to particles, and the combined state is applied to the change of our universe.

From logarithmic elliptic equation of super gauge symmetry, the standard masses and oscillating masses of six fundamental particles are calculated. The combination of the logarithmic sum mass or average mass makes all things. The core is that the compressed quantum space gives the particle the mass.

The purpose of this chapter is to calculate the masses of three generation neutrinos (electron, muon, and tau) and three generation gravinos (graviton, photon, and gluon) by applying logarithmic elliptic equation.

2. Analysis of kinetic state

2.1 Measured mass of muon and tau neutrinos

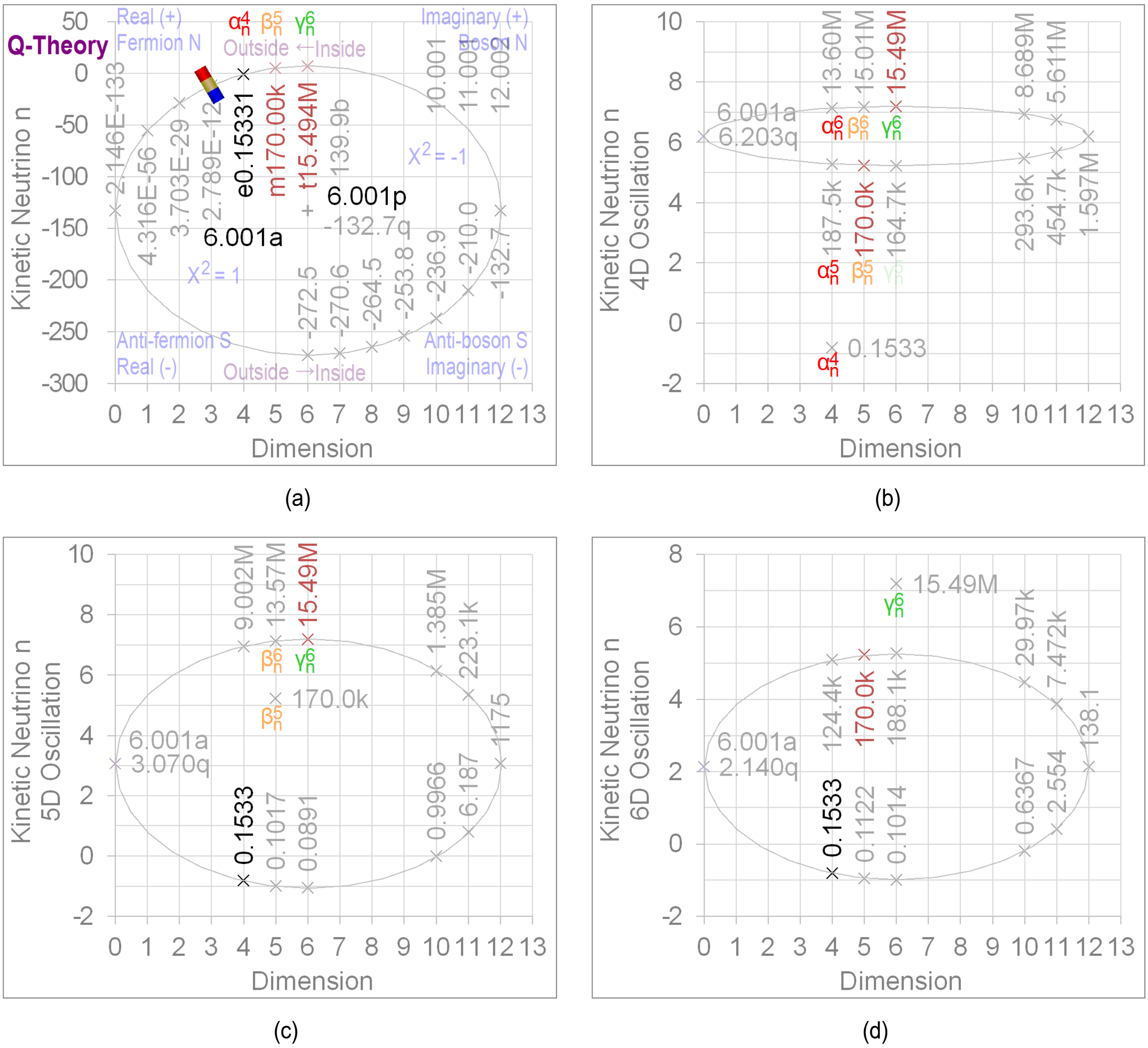
The minimum masses of muon and tau neutrinos were measured as 170 keV and 15.5 MeV. These are kinetic state. According to author's overall calculation, the relation between muon mass B_n^5 and tau mass Γ_n^6 of Eq. (1) is calculated from the unification of four fundamental forces in Chapter 5. That is, the condition for calculating the gravitational force coupling constant 5.906E-39 is Eq. (1). When the mass of muon neutrino is 170.00 keV, the mass of tau neutrino is calculated as 15.494 MeV. This means that if the muon mass is known, the tau mass is calculated correctly.

Table 1 Calculation of the masses of gravinos in kinetic state and steady state.

Term	Sub.	Kinetic State			Steady State			Unit	Symbol		
		Electron	Muon	Tau	Electron	Muon	Tau				
Lepton	Table 3.1	510.999k	105.658M	1.77686G	510.999k	105.658M	105.658M	eV	$\mathrm{AB}\Gamma_{NG}^{456}$	$\mathrm{B}\Gamma_{NG}^{56}$	Γ_{NG}^{6}
Quantum	Space	4D	5D	6.00108D	4D	5D	6.00108D				
n + g	Table 3.1	-10.418	4.435	9.250	-10.418	4.435	9.250	log	α_{ng}^4	β_{ng}^5	γ_{ng}^6
Neutrino	Fig(a). 1, 3	0.15331	170.00k	15.494M	0.13841	165.79k	15.493M	eV	A_n^4	B_n^5	Γ_n^6
		-0.8144	5.230	7.190	-0.8588	5.220	7.190	log	α_n^4	β_n^5	γ_n^6
Gravino	Eq. (2)	-9.603	-0.7959	2.059	-9.559	-0.785	2.060	log	α_g^4	β_g^5	γ_g^6
	Fig(a). 2, 4	2.492E-10	0.1600	114.7	2.760E-10	0.1641	114.7	eV	A_g^4	B_g^5	Γ_g^6

(1) $\Gamma_n^6\ [MeV] = 91.1411 \cdot \mathrm{B}_n^5\ [keV] + 0.00344054$ in kinetic state.

(2) $\alpha_g^4 = \alpha_{ng}^4 - \alpha_n^4 \qquad \beta_g^5 = \beta_{ng}^5 - \beta_n^5 \qquad \gamma_g^6 = \gamma_{ng}^6 - \gamma_n^6$



(a) (b) (c) (d)

Fig. 1 The masses of neutrinos in kinetic state

2.2 Standard masses of neutrinos

In Fig. 2.2, the characteristics of logarithmic elliptic equation were described in detail. Given four constants (p, q, a, b), elliptic equation is calculated. In Table 1 and Fig. 1(a), the measured mass of muon neutrino is 170.00 keV on 5D, the mass of tau neutrino by Eq. (1) is 15.494 MeV on 6.00108D, the left vertex is 0D, and the top vertex is 6.00108D. From these four constants, the neutrino masses are calculated as shown in Table 1 and Fig. 1(a).

As the result of calculation, the mass of electron neutrino is 0.15331 eV on 4D. Here, the meaning of numbers and letters shown in Fig. 1(a) were described in Fig. 2.3.

2.3 Oscillating masses of neutrinos

In (a), selecting the 170.0 keV on 5D and 15.49 MeV on 6.00108D, (b) also is correct answer. That is, solving the logarithmic elliptic equation, three kinds of answers are calculated. One answer is the standard mass, and the other two answers are oscillating masses. This is the neutrino oscillation phenomenon. This is a characteristics of quantum space, and neutrino jumps between the dimensions of quantum space. The standard masses of neutrinos are electron α_n^4 0.1533 eV, muon β_n^5 170.0 keV, and tau γ_n^6 15.49 MeV, and the others are oscillating masses.

In (a), selecting the 0.1533 eV on 4D and 15.49 MeV on 6.00108D, (c) also is correct answer. In (a), selecting the 0.1533 eV on 4D and 170.0 keV on 5D, (d) also is correct answer. That is, all values in Fig. 1 are correct answers.

2.4 Standard masses of gravinos

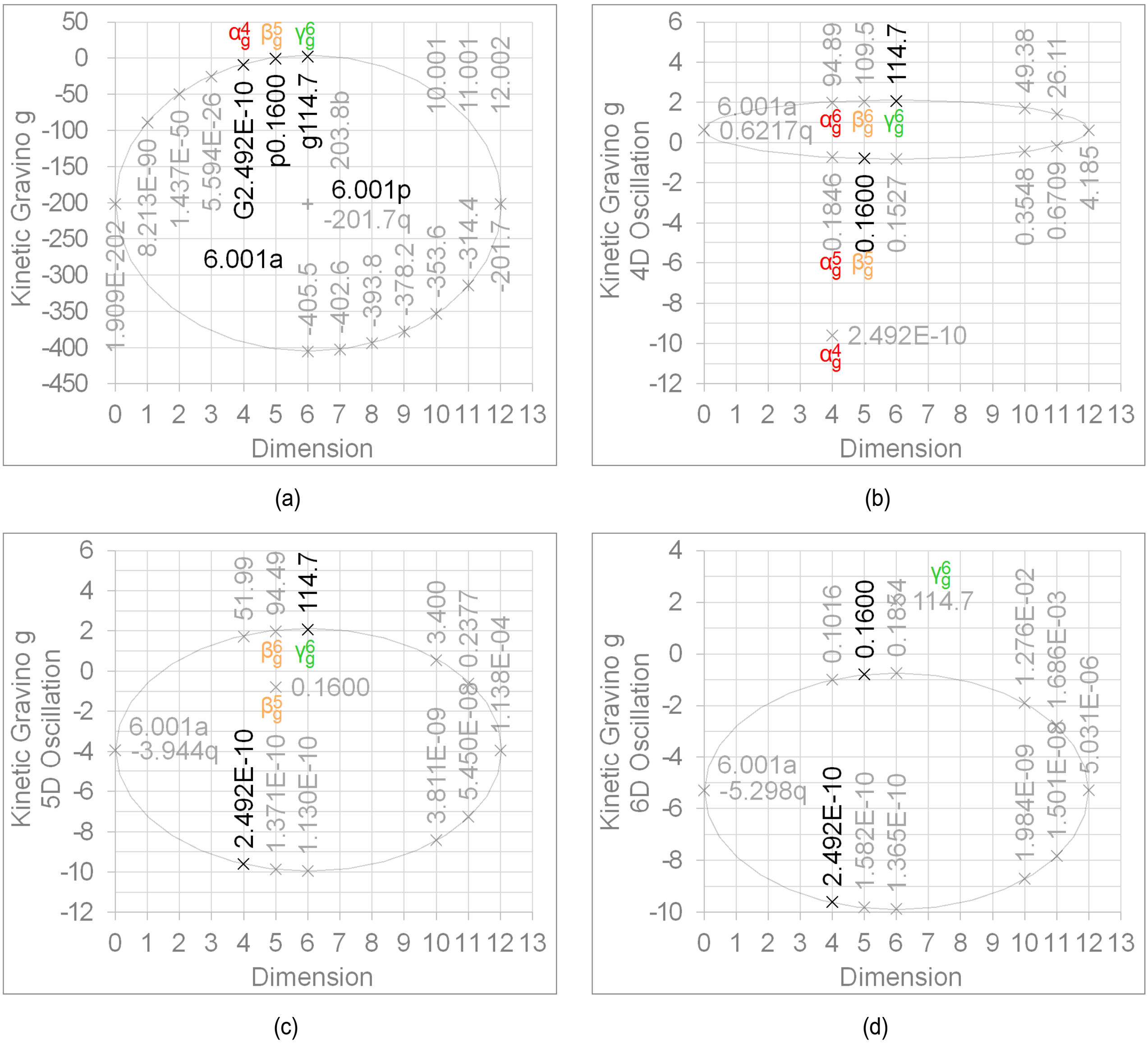


Fig. 2 The masses of gravinos in kinetic state

The logarithmic sum mass of neutrino and gravino was calculated as Table 3.1. From Eq. (2) in Table 1, the standard masses of gravinos are calculated as graviton α_g^4 2.492E-10 eV, photon β_g^5 0.1600 eV, and gluon γ_g^6 114.7 eV. The results are shown in Fig. 2(a).

2.5 Oscillating masses of gravinos

By the same logic such as Fig. 1(b-d), the gravino oscillation phenomena in Fig. 2(b-d) are calculated. The sum of a standard neutrino and an oscillating gravino is a force particle. This will be described in detail in Chapter 5.

2.6 Jump mass and Proper mass

Since neutrinos and gravinos jump through quantum space, their masses are change at the speed of light. Here, the average value of the jump masses becomes a constant. Due to this, particles appear to have the proper mass.

3. Analysis of steady state

3.1 Calculated mass of muon and tau neutrinos

The steady state neutrino masses cannot be measured. Therefore, the masses must be calculated inversely by trial & error method for the masses of charm quark and top quark. However, the measured mass of charm and top quarks are presented as the range 1275^{+25}_{-35} MeV and 172 ~ 173 GeV. Therefore, two conditions that are known precisely are required.

3.2 Standard masses of neutrinos

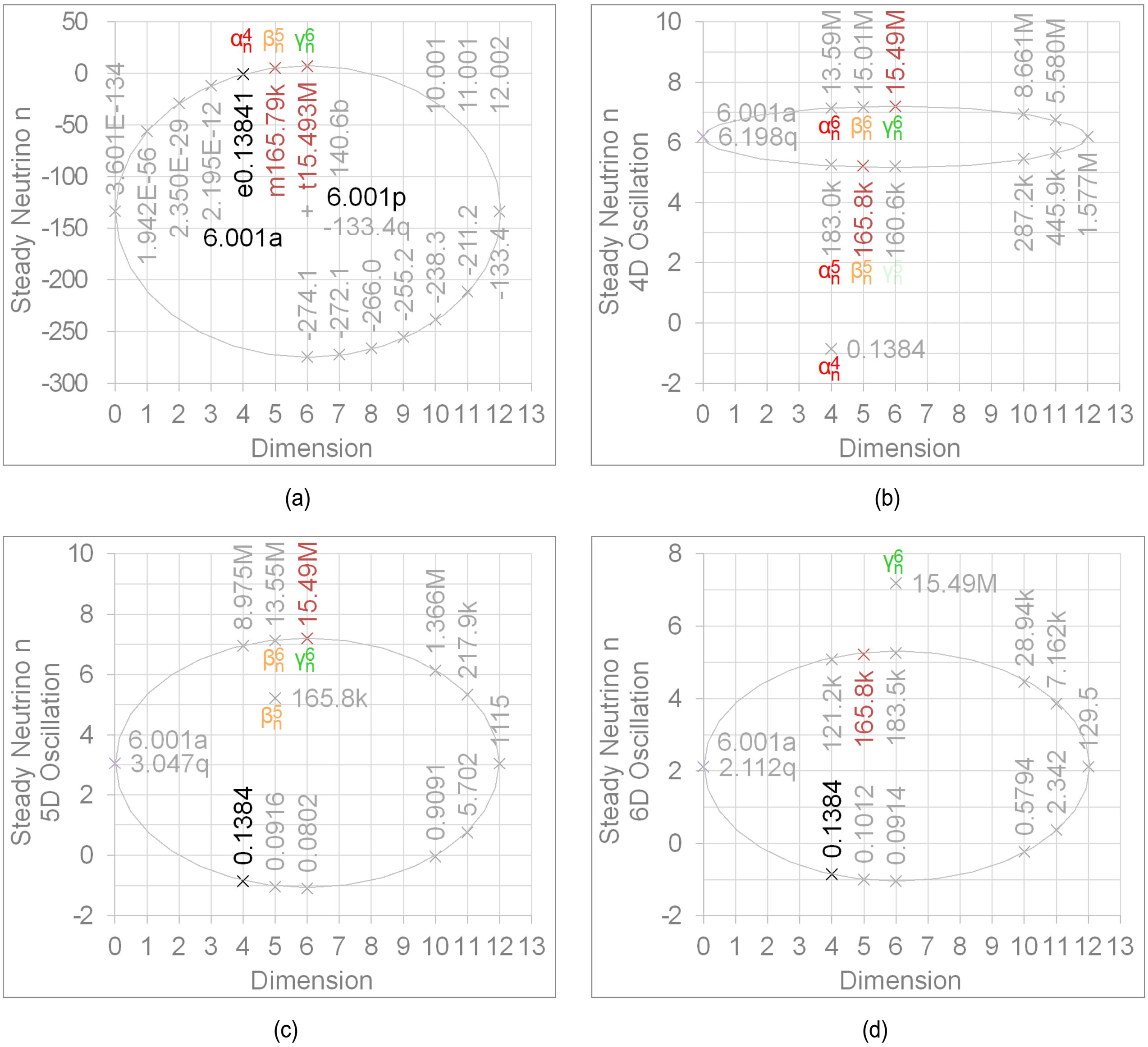


Fig. 3 The masses of neutrinos in steady state

The steady-state neutrino masses of muon and tau are calculated as 165.79 keV and 15.493 MeV from proton mass 938.272 MeV and Z boson mass 91.1876 GeV in Fig. 3.1. The calculation process will be described in Chapter 6 and 8.

Given four constants (p, q, a, b), elliptic equation is calculated. In Fig. 3(a), the muon neutrino mass is 165.79 keV on 5D, the tau neutrino mass is 15.493 MeV on 6.00108D, the left vertex is 0D, and the top vertex is 6.00108D. From these four constants, the mass of electron neutrino is calculated as 0.13841 eV on 4D.

3.3 Oscillating masses of neutrinos

The calculation and analysis are same as in Fig. 1. Neutrino oscillation masses in (b-d) are calculated by Fig. 3(a).

3.4 Standard masses of gravinos

If the masses in Fig. 3(a) are applied to Eq. (2) in Table 1, the standard gravino masses in Fig. 4(a) are calculated. However, the values are judged to be slightly incorrect. As described in Chapter 3, the masses of steady-state electron, muon, and tau are needed.

These values are applied to calculate the down, strange and bottom quark masses. This will be described in detail in Chapter 8. However, since the masses of the gravinos in steady state has a little error, the mass of the quarks also has a little error.

3.5 Oscillating masses of gravinos

By the same logic such as Fig. 3(b-d), the gravino oscillation phenomena in Fig. 4(b-d) are calculated.

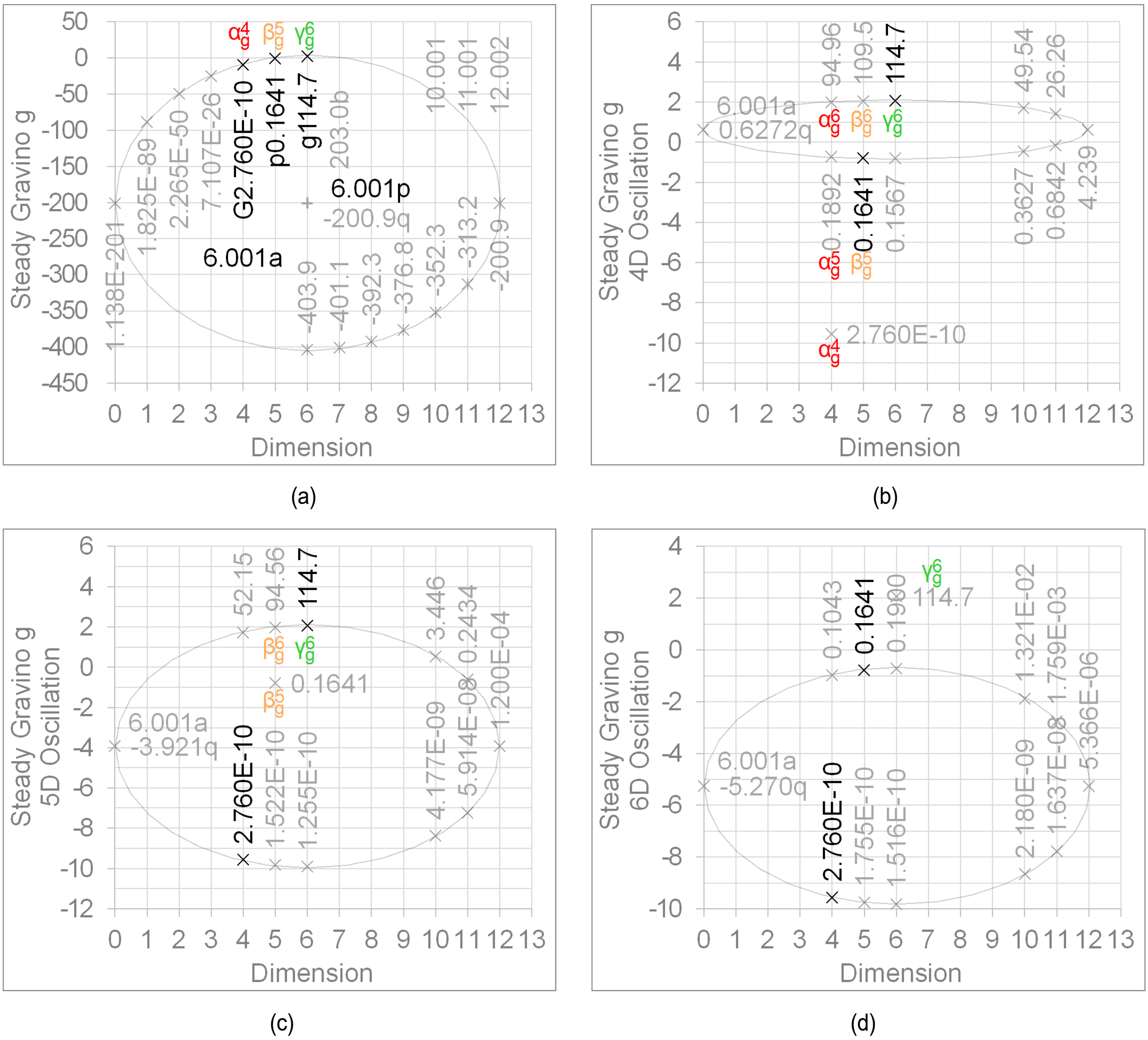


Fig. 4 The masses of gravinos in steady state

4. Conclusions

Applying the kinetic state masses of muon neutrino 170.00 keV and tau neutrino 15.494 MeV to logarithmic elliptic equation, the mass of electron neutrino is calculated as 0.15331 eV. From the masses of electron, muon, and tau, the masses of graviton, photon, and gluon in kinetic state are calculated as 2.492E-10 eV, 0.1600 eV, and 114.7 eV.

In steady state, from proton mass 938.272 MeV and Z boson mass 91.1876 GeV, the steady state mass neutrinos of electron, muon and tau are calculated as 0.13841 eV, 165.79 keV, and 15.493 MeV.

The standard and oscillating masses of three generation neutrinos and three generation gravinos were calculated. The masses of all particles were calculated as the logarithmic combination of the neutrinos and gravinos.

Four fundamental forces are the combination particles of one standard neutrino and one oscillating gravino in kinetic state, and quarks are the combination particles of neutrinos and gravinos in steady state.

Dimensional Planck particle is the dimensional combined state, which is the basis for calculating dimensional universe changes. From this, the characteristics of all dimensional universes are calculated.

5. Unification of Four Fundamental Forces

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Keywords: Electromagnetic force, Four fundamental forces, Gravitational force, Strong force, Weak force

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Abstract Force is a particle composed of standard neutrino (electron, muon, tau) and oscillating gravino (graviton, photon, gluon). Force is kinetic state and has mass. From the outside of our universe, three generation dark forces that we cannot understand are affecting weak force, electromagnetic force, and strong force. The sum 2.692 of three generation dark forces is the ratio 72.92% = 2.692 / (2.692 + 1) of dark energy and dark matter. The four fundamental forces are unified by logarithmic parabolic equation. From this, the weak force coupling constant and the gravitational force coupling constant are calculated as 1.0109E-6 and 5.906E-39. In steady state, the sum of three generation dark forces is calculated as 2.702, and the ratio of dark energy and dark matter is calculated as 72.99% = 2.702 / 3.702.

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1. Introduction

Weak force, electromagnetic force, and strong force are combination particles of three generation standard neutrinos and three generation oscillation gravinos. Since the force is a particle, the mass of the force is calculated from Fig.1 and 2 of Chapter 4. When strong force is 1, electromagnetic force is 1/137.036, weak force is about 1.E-6, and gravitational force is 5.906E-39. From this chapter, the exact value of weak force is calculated. The above values are the forces in kinetic state. Force analysis in steady state is required.

The purpose of this chapter is to unify the four fundamental forces by logarithmic parabolic equation.

2. Shape of four fundamental forces

2.1 Three generation quantum spaces

Such as Fig. 1.6, there are three generation quantum spaces, and they make three generation particles and give them properties. Quantum space is compressed logarithmically. Therefore, all mass calculations must be proceeded logarithmically.

2.2 Three generation neutrinos and gravinos

All things are composed of three generation neutrinos (electron, muon, tau) and three generation gravinos (graviton, photon, gluon). Here, gravino is a word coined by author. Three generation neutrinos make the shape of particle, and three generation gravinos make the force of particle.

2.3 Standard and Oscillation

When electron neutrino is located on 4D space, it has a standard mass. It jumps from 4D space, it moves into 5D or 6D space, and its mass is changed very greatly. This is the neutrino oscillation phenomenon. The above phenomenon occurs at all neutrinos and gravinos in Fig 4.1 – 4.4.

2.4 Shape in kinetic state

The shapes of weak force particle, electromagnetic force particle, and strong force particle are shown in Fig. 1. Where, α, β, and γ mean each 1st, 2nd, and 3rd generation fundamental particles, subscript n and G mean standard neutrino and oscillating gravino, and superscript 4, 5, and 6 mean the 4D, 5D, and 6D of quantum spaces.

α_n^4, β_n^5, and γ_n^6 are each standard electron neutrino on

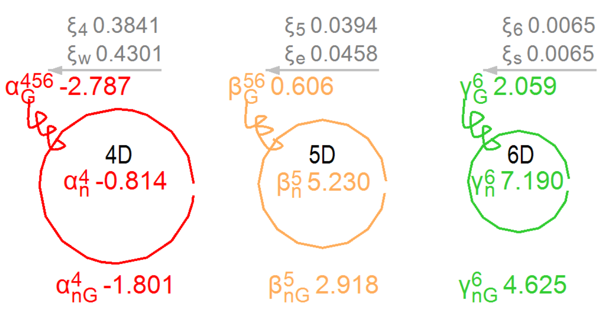


Fig. 1 Shape of particle forces in kinetic state

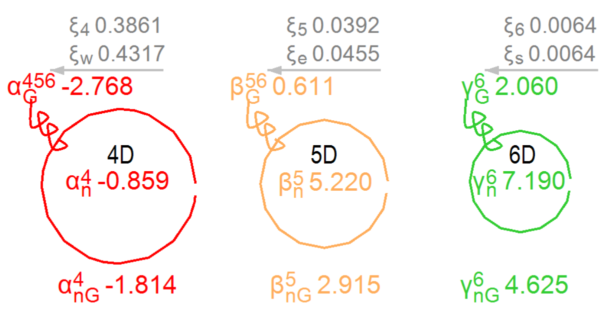


Fig. 2 Shape of particle forces in steady state

Table 1 Analysis of four fundamental forces.

Term	Sub.	Kinetic State			Steady State			Unit	Symbol		
Neutrino	Fig. 4.1(a)	Electron	Muon	Tau	Electron	Muon	Tau				
	Standard	0.15331	170.00k	15.494M	0.13841	165.79k	15.493M	eV			
		-0.8144	5.230	7.190	-0.8588	5.220	7.190	log	α_n^4	β_n^4	γ_n^4
Gravino	Fig. 4.2(b-d)	Graviton	Photon	Gluon	Graviton	Photon	Gluon				
Eq. (1)	Oscillating	-2.787	0.6057	2.059	-2.768	0.611	2.060	log	α_G^{456}	β_G^{56}	γ_G^6
Force		Weak	E.M.	Strong	Weak	E.M.	Strong				
(n + G) / 2	Particle	-1.801	2.918	4.625	-1.814	2.915	4.625	log	α_{nG}^4	β_{nG}^4	γ_{nG}^4
		0.01583	828.1	42.15k	0.01536	823.1	42.15k	eV	m_w	m_e	m_s
		-6.425	-1.707	0.000	-6.438	-1.709	0.0000?	log	$\alpha_{nG}^{4\prime}$	$\beta_{nG}^{4\prime}$	$\gamma_{nG}^{4\prime}$
Eq. (2)	Physical	1.0109E-6	1/137.036	1.0000	0.9847E-6	1/138.374	1.0000?	-	f_w	f_e	f_s
ξ_w = 0.4301, 0.4316		-5.995	-2.137	0.000	-6.007	-2.141	0.0001	log	f_w'	f_e'	f_s'
	2.692, 2.702	Gravity 5.906E-39			Gravity 5.046E-39			-	f_g		

(1) $\alpha_G^{456} = Fig4.2(b)\left(\alpha_g^4 + \alpha_g^5 + \alpha_g^6\right)/3 \quad \beta_G^{56} = (Fig4.2(b)\,\beta_g^5 + \beta_g^6 + Fig4.2(c)\,\beta_g^5 + \beta_g^6)/4 \quad \gamma_G^6 = (\gamma_g^6 + \gamma_g^6 + \gamma_g^6)/3$

(2) $f_w / f_e = m_P^2 / m_W^2$ = 1.3626E-4 & $\xi_w = \beta_{nG}^{4\prime} - f_e' = f_w' - \alpha_{nG}^{4\prime}$

4D, standard muon neutrino on 5D, and standard tau neutrino on 6D. α_G^{456}, β_G^{56}, and γ_G^6 are each oscillating graviton on 4D5D6D, oscillating photon on 5D6D, and oscillating gluon on 6D. Therefore, α_{nG}^4, β_{nG}^5, and γ_{nG}^6 are each weak force particle on 4D, electromagnetic force particle on 5D, and strong force particle on 6D.

2.5 Shape in steady state

Everything is divided into kinetic state and steady state such as Fig. 1 and Fig. 2. Force particles always react with other particles, so force is always in kinetic state. However, if force particle is perfectly isolated, it becomes steady state.

3. Electromagnetic force and Weak force

3.1 Standard neutrino masses

In Chapter 4, the masses of three generation neutrinos and gravinos were calculated. The standard masses of three generation neutrinos are shown in Fig. 4.1(a). In kinetic state of Table 1, the neutrino masses of muon 170.00 keV and tau 15.494 MeV were given, and the mass of electron neutrino 0.15331 eV is the value calculated by author. In steady state of Table 1, the three generation neutrino masses in Fig. 4.3(a) are calculated in Chapter 6 and 8..

3.2 Oscillating gravino masses

The oscillating masses of three generation gravinos are shown in Fig. 4.2(b-d) and Fig. 4.4(b-d). All must be calculated as logarithmic mass. The values calculated from Eq. (1) are presented in Table 1. The oscillation phenomenon is described in detail in Chapter 4.

3.3 Particle force

The particle force is the average value of standard neutrino n and oscillating gravino G. Therefore, the masses of weak particle force, electromagnetic particle force, and strong particle force are each 0.01583 eV, 828.1 eV, and 42.15 keV. Since all forces are described based on strong force, subtracting 4.625 from the logarithmic values, they are each -6.425, -1.707, and 0.000.

3.4 Physical force

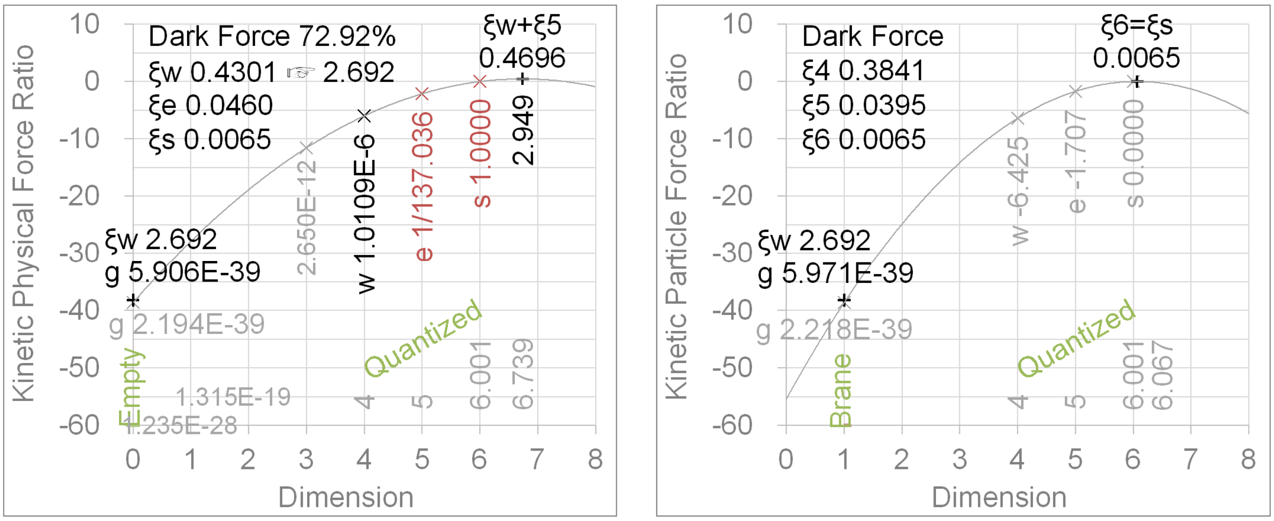
In physics, when the strong force coupling constant is 1, that of electromagnetic force coupling constant is 1/137.036, and that of weak force is about 1/1E-6. Therefore, the logarithmic values are each 0.000, -2.137, and about -6.000. This is kinetic state.

The steady-state force is author's suggestion.

3.5 Weak dark force = Dark energy / Dark matter

In the electromagnetic force, the particle force is -1.707, but the physical force is -2.137. There was a logarithmic difference of ξ_w 0.4301, which is the weak dark force. The normal value is 10^0.4301 or 2.692 in Fig. 3. Dark energy is 2.692, and dark matter is 1.000. Therefore, the ratio of dark energy and dark matter is 2.692 / 3.692 : 1.000 / 3.692 = 72.92% : 27.07%. However, dark energy does not exist. The reason will be described in Chapter 11.

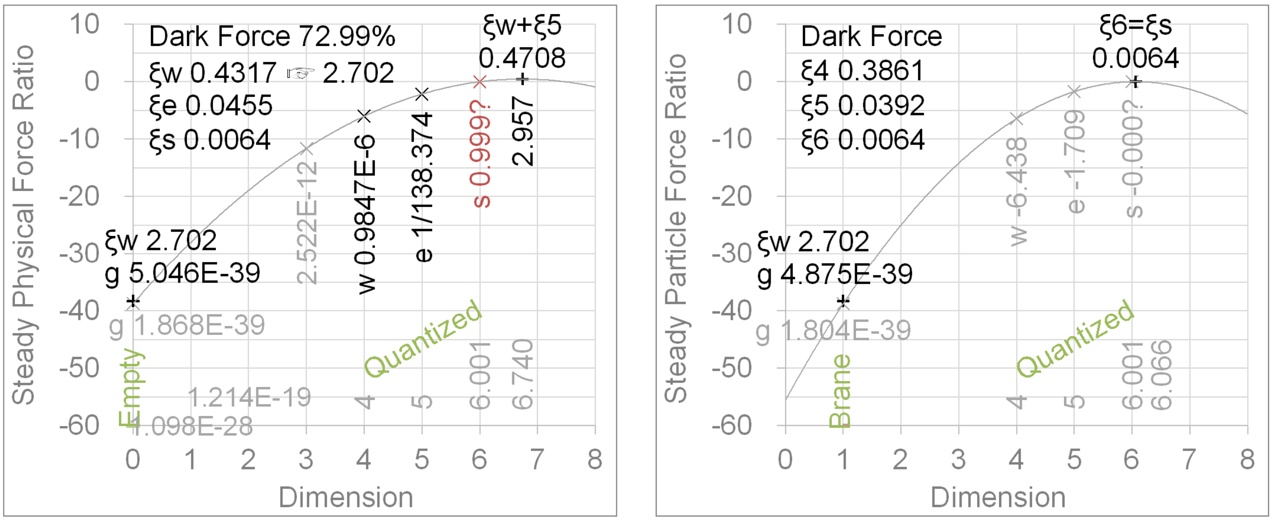
In steady state of Fig. 5, calculating Eq. (2), the dark weak force ξ_w is calculated as 0.4317, that is, 2.702. In this case, the ratio of dark energy to dark matter is 72.99% : 27.01%. Where, m_P is proton mass 938.272 MeV, and m_W is W



(a) Physical force

(b) Particle force

Fig. 3 Forces for kinetic state



(a) Physical force

(b) Particle force

Fig. 4 Forces for steady state

boson mass 80.3754 GeV of Fig. 1.5(b).

3.6 Electromagnetic force

In physics, the electromagnetic force coupling constant is given as 1/137.036. This is the value in kinetic state. The value in steady state is calculated as 1/138.374.

3.7 Weak force

Adding the ξ_w 0.4301 and 0.4317 of weak dark force to the weak particle force -6.425 of kinetic state and -6.438 of steady state, the logarithmic value is calculated as -5.995 and -6.007. Therefore, weak physical force is calculated as 1.0109E-6 and 0.9847E-6.

3.8 Strong force in steady state

The basis of calculation is the kinetic state strong force of 1.0000 in Fig. 3. That is, it is clear that the steady state strong force in Fig. 5 is slightly smaller than 1.0000. Therefore, the value should be given as an input variable, but it is not known.

The value will be calculated from the ratio of the kinetic state quark radius in Fig. 7.5 and the steady state quark radius in Fig. 7.6. For the calculation, the steady-state hydrogen radius is needed. It is slightly smaller than the Bohr radius, and the 51.73 pm in Fig. 7.6 is an estimated value.

3.9 Absolute dominant object

Something subtracts the logarithmic value 0.4301 or 0.4317 from electromagnetic particle force and adds it to weak particle force. The result is physical force. This is our universal phenomenon. That is, there is an object outside our universe that absolutely dominates our universe. Author calls it mommy quantum hole.

3.10 Kinetic state, Steady state

Since the forces always react at the speed of light, its coupling constants of Fig. 3 is the correct answer. However, if the forces are confined to a particle that does not react with the force, the forces change to the steady state of Fig. 5. This changes the radius of particle. This is the proton radius puzzle problem in Chapter 7.

Our universe is expanding at the speed of light, and forces are also reacting at the speed of light. Therefore, the ratio 2.692 / 3.692 = 72.92% of dark energy to dark matter is correct answer.

4. Gravitational force and Dark forces

4.1 Empty gravity toward 4D empty space

Our space is calculated as 6.00108D in Chapter 3. The physical values of strong, electromagnetic, and weak force are shown in Fig. 3 for kinetic state and Fig. 5 for steady state. Applying logarithmic parabolic equation to the logarithmic values, the value of 0D is calculated as 2.194E-39. Multiplying that value by the weak dark force 2.692, it is calculated as 5.906E-39. In physics, the gravitational force coupling constant is 5.906E-39.

In Fig. 3, the 0D means an empty space in which there is no quantum space. If it is a perfect empty space, the value of gravity should be calculated as exactly zero. However, something is causing as much force as 5.906E-39. Universe is similar to the shape of hydrogen. Something has made universe to 4D sphere. Gravity is that particle tries to fall towards the something that exists in the 4D empty space. Weak force occurs gravity, and proton is the gravity sink hole. Therefore, muon, tau, photon, and gluon only travel straight through the curved space and do not cause gravity.

4.2 Calculation of tau neutrino mass

The tau neutrino mass has been measured to be less than 15.5 MeV. When the value is 15.494 MeV in Table 1, gravity is calculated as 5.906E-39 in Fig. 3. Therefore, tau neutrino mass is calculated from 5.906E-39. The formula that always satisfies above is Eq. (1) in Table 4.1.

4.3 Brane tension

Fig. 4 for kinetic state and Fig. 6 for steady state are the particle masses in Table 1. The 4D, 5D, and 6D are quantum spaces compressed logarithmically. The 1D is a brane that spreads as a straight line on our spherical universe. Particles are produced from universal brane. Therefore, the particles in Table 1 are the same as brane. The brane's tension is

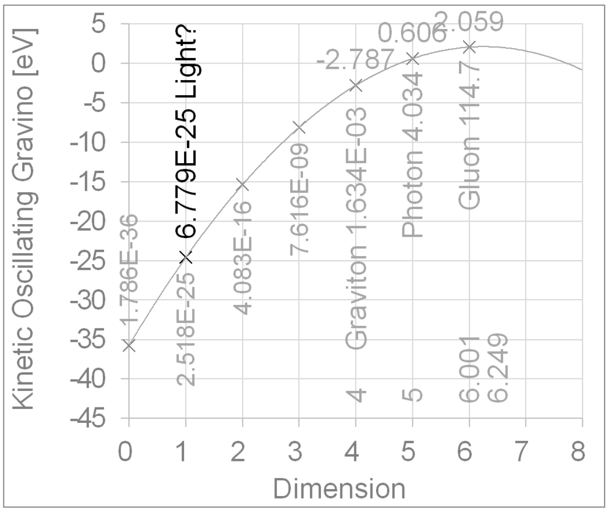


Fig. 5 Mass of light

2.218E-39. The weak dark force of 2.692 acts to the brane, so its value becomes 5.971E-39.

4.4 Floating in universe

The empty gravity 5.906E-39 is that an object tries to fall toward a 4D empty space, and the brane tension 5.971E-39 is that holds on the object for it cannot fall. Brane tension is slightly larger than empty gravity. This causes all objects in universe to float in space.

4.5 Dimensional dark forces

In Fig. 4, the vertex is logarithmically as high as 0.0065. This is 6D dark force ξ_6. In Fig. 3, the vertex is logarithmically as high as 0.4696. Subtracting the weak dark force ξ_w 0.4301 from the 0.4696, the value is 0.0395. This is the 5D dark force ξ_5. Therefore, subtracting ξ_5 0.0395 and ξ_6 0.0065 from weak dark force ξ_w 0.4301, and 4D dark force ξ_4 is calculated as 0.3841. Three generation quantum hole occurs the three generation dark forces.

4.6 Particle dark forces

In Fig. 1, graviton α_G^{456} receives ξ_4 0.3841 on 4D, ξ_5 0.0395 on 5D, and ξ_6 0.0065 on 6D. Therefore, the weak dark force ξ_w is 0.4301. Photon β_G^{56} receives ξ_5 0.0395 on 5D and ξ_6 0.0065 on 6D. Therefore, the electromagnetic dark force ξ_e is 0.0460. Gluon γ_G^{6} receives ξ_6 0.0065 on 6D. Therefore, the strong dark force ξ_s is 0.0065.

4.7 Mass of light

Photon is a particle that exists in 5D quantum space, and light may be a wave in line space 1D. The masses of graviton, photon, and gluon are shown in Fig. 5. Applying logarithmic parabolic equation to the above values, the value of 1D is

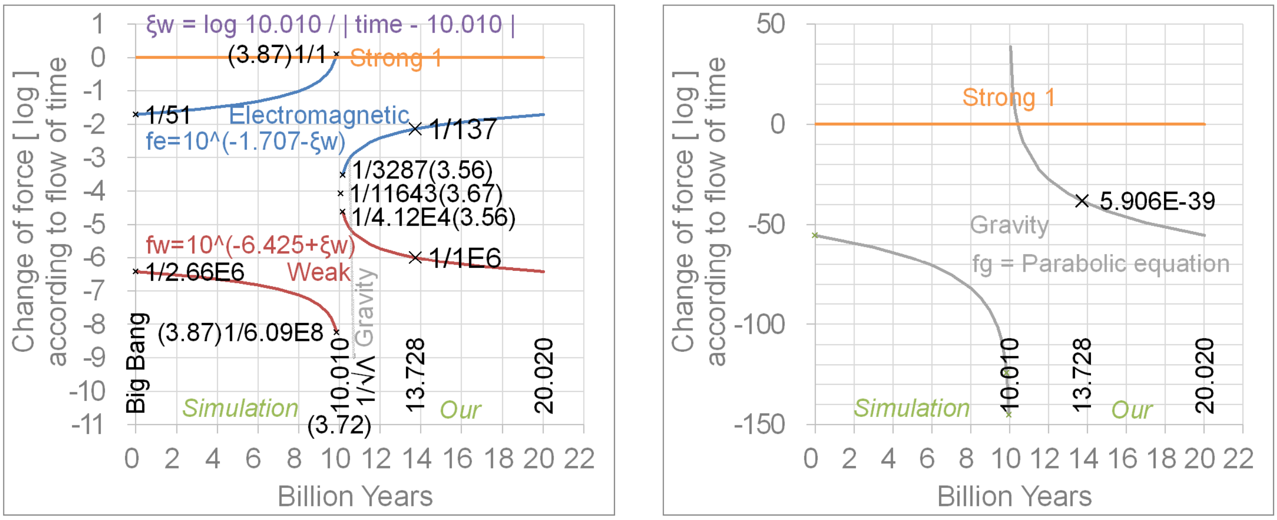


Fig. 6 Birth of simulation universe and Characteristic change of quantum space

calculated as 2.518E-25 eV. Light is also assumed to be affected by the weak dark force 2.692. The mass of light may be 6.779E-25 eV. The key is to show the exact shape of light. The exact mass of light will be one value of the various values presented in overall chapters.

5. Birth of simulation universe

5.1 Meaning of cosmological constant

The cosmological constant Λ is calculated as 1.1150E-52 /m2 in Chapter 9. Physics suggests 1.1056E-52, the above difference is 0.85%. Converting the Λ into 1/√Λ by Eq. (2.3), the value is 10.010 billion years. This is 3D Planck length of 3D universe. That is, the cosmological constant is the quantum mechanics of the overall universe. This is extended to the concept of universe 1, universe 2, universe 3. This is equivalent to first shell, second shell, and third shell of atom.

5.2 Meaning of weak dark force

As shown in Fig. 6, the dark weak force ξ_w is 10.010 / | time -10.010 |. Substituting 13.728, the value is 2.692. Our quantum hole is dark matter, and the quantum hole at 10.010 billion years is the 3D Planck star.

5.3 Change of force according to time

In Fig. 6, the -1.707 and -6.425 are the particle forces in Table 1. The dark weak force ξ_w changes according to the flow of time. This causes the electromagnetic and weak forces to change also. The calculation result is shown in Fig. 6, and this is the super gauge symmetry. If the formula is 10.010 / (time -10.010), the figure on the right side repeats over and over again.

5.4 Birth of simulation universe

Every 10.010 billion years, a cosmological phenomenon that cannot be understood by physics occurs. The beginning is the birth of our universe due to the Big Bang. At 10.010 billion years (3.718 billion years ago), our simulation universe was born. This repeats every 10.010 billion years.

5.5 Change of physical constant value with time

Above analysis means that many physical constants change with time. Here, the sum of the electromagnetic force and the weak force in Fig. 6 is always the constant of 1/11643. This means that there are a few always constants. That is, many of the calculations in physics will be correct.

5.6 Origin of life

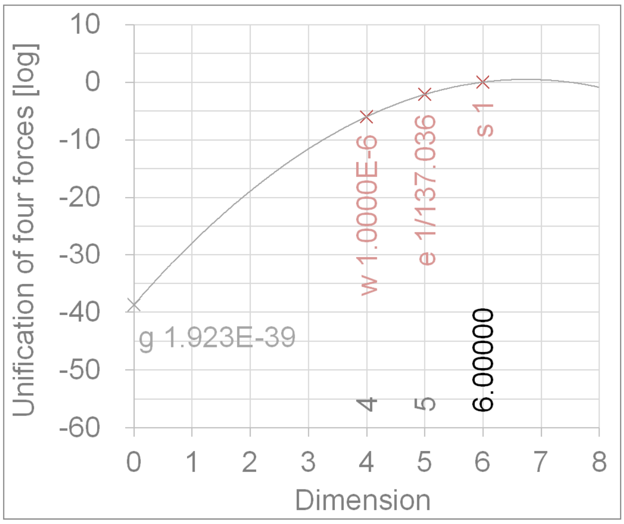
Earth's first life was discovered as a fossil 3.5 billion years ago. Biology believes that the first life on Earth was born between 3.8 and 4.2 billion years ago. However, fossils of life before 3.5 billion years have not yet been discovered.

First life has been born cosmically after 3.72 billion years ago in Fig. 6. This means that there were only stones in our universe before 3.72 billion years ago. A mixture of non-living and living things was born from 3.72 billion years ago, a first imperfect living thing began to be born at 3.68 billion years ago, and a first perfect living thing began to be born at 3.56 billion years ago.

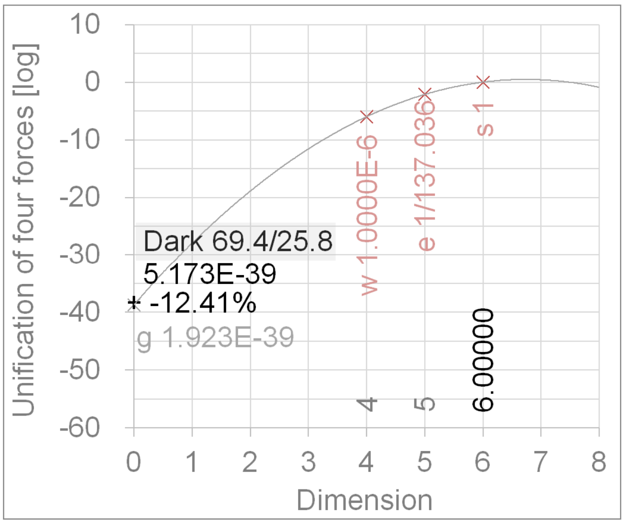
6. Unification of four fundamental forces

6.1 Logarithmic parabolic equation

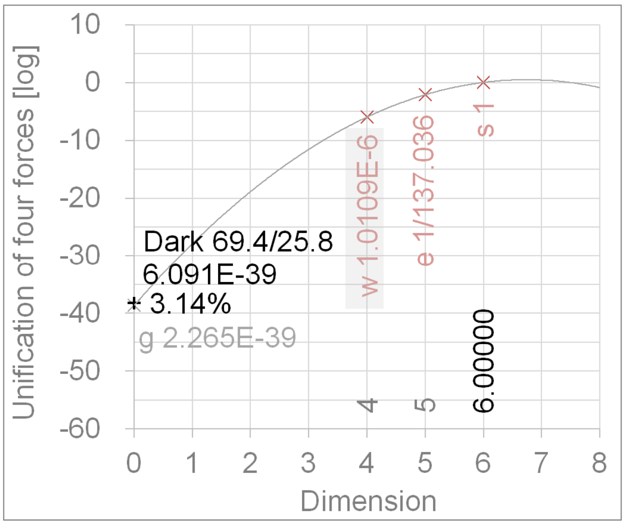
As shown in Fig. 7(a), if strong force is 1 on 6.00000D, electromagnetic force is 1/137.036 on 5D, weak force is about 1E-6 on 4D, and the logarithmic parabolic equation is plotted at the three points, the value on 0D is calculated as 1.923E-39.



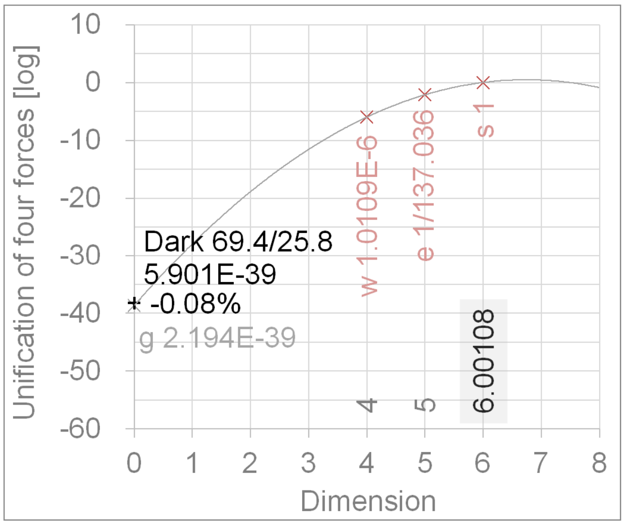
(a) Logarithmic parabolic equation



(b) Ratio of dark energy and dark matter



(c) Weak interaction coupling constant



(d) Dimension of quantum space

Fig. 7 Unification of four fundamental forces

6.2 Ratio of dark energy and dark matter

As shown in (b), multiplying the value by the ratio of dark energy 69.4% and dark matter 25.8%, the value on 0D is calculated as 5.173E-39, and the error is -12.41%.

6.3 Weak interaction coupling constant

As shown in (c), substituting the weak interaction coupling constant 1.0109E-6, the value on 0D is calculated as 6.091E-39, and the error is 3.14%.

6.4 Dimension of quantum space

As shown in (d), substituting the dimension of quantum space 6.0109, the value on 0D is calculated as 5.901E-39, and the error is -0.08%.

The value of 69.4/25.8 is 2.690, and the exact value is 2.692 in Fig. 3. It is understood that the origin of gravity will be revealed only when the identity of dark energy and dark matter is revealed.

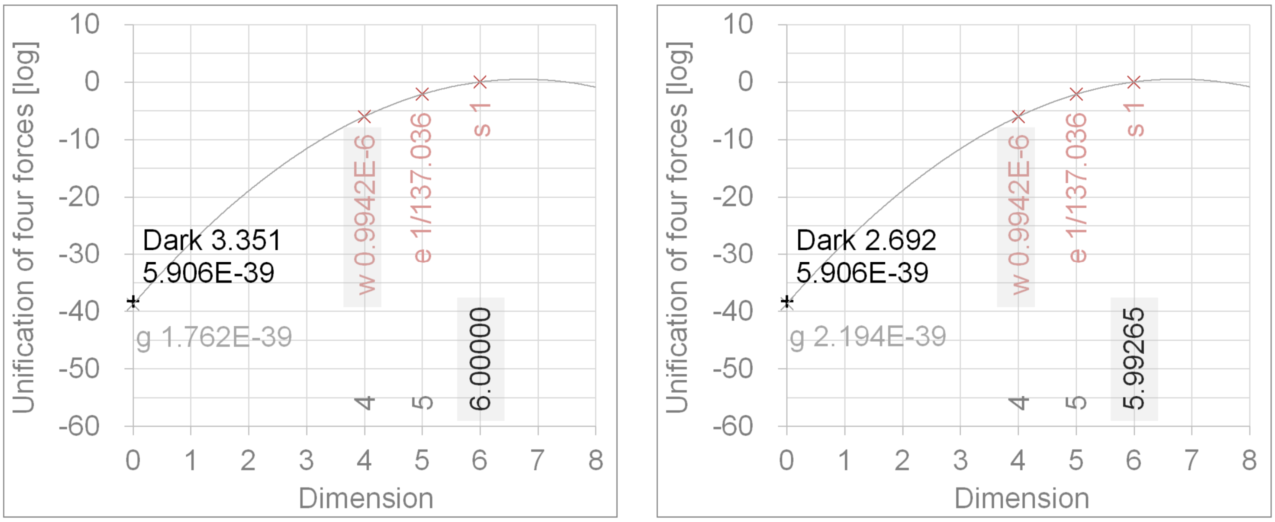
7. Five ways for calculating weak force

7.1 From the ratio of dark energy and dark matter

From the lifetime of decay in physics, the ratio of weak and strong forces is Eq. (2).

$$f_w \,/\, f_s \;=\; \sqrt{\;\tau_\Delta \,/\, \tau_\Sigma} \;=\; \sqrt{6\text{E-}24/8\text{E-}11} = 0.27386\text{E-}6 \qquad (2)$$

$$f_w = 0.27386\text{E-}6 \;\cdot\; (2.692 + 1) = 1.0111\text{E-}6 \qquad (3)$$



(a) Dimension 6.00000 (b) Dimension 5.99265

Fig. 8 Weak force 0.99426E-6 form W boson

Multiplying Eq. (2) by the sum of dark weak force 2.692 and 1, f_w is calculated as 1.0111E-6. This is 0.02% error from the 1.0109E-6.

7.2 From ΛCDM and Cosmological constant

The ΛCDM model suggests that the age of our universe is 13.772 billion years, and the cosmological constant time is calculated as 10.053 billion years in Eq. (2.3).

$$f_w = 0.27386\text{E-}6 \cdot 13.772 / (13.772 - 10.053) = 1.0141\text{E-}6 \quad (4)$$

$$f_w = 0.27386\text{E-}6 \cdot 100\% / (100\% - 72.92\%) = 1.0111\text{E-}6$$

From Eq. (4), f_w is calculated as 1.0141E-6. This is 0.32% error, and it is the error of measurement. Therefore, it is inferred that 13.772 billion years of Hubble time is the sum of dark energy and dark matter 100%, and 10.053 billion years of cosmological constant time is dark energy 72.92%.

7.3 From the radius of proton

Substituting the Bohr radius r_H of 52.918 pm, the electromagnetic force f_e of 1/137.036, and the measured proton radius r_P of 0.8751 fm into Eq. (5), the f_w is calculated as 1.0109E-6.

$$f_w \cdot r_H = 8\pi/3 \cdot f_e \cdot r_P \rightarrow f_w = 1.0109\text{E-}6 \quad (5)$$

Above all values are accurate values. Therefore, the exact value of the weak force is determined as 1.0109E-6. This value is exactly equal to the weak force in Fig. 3.

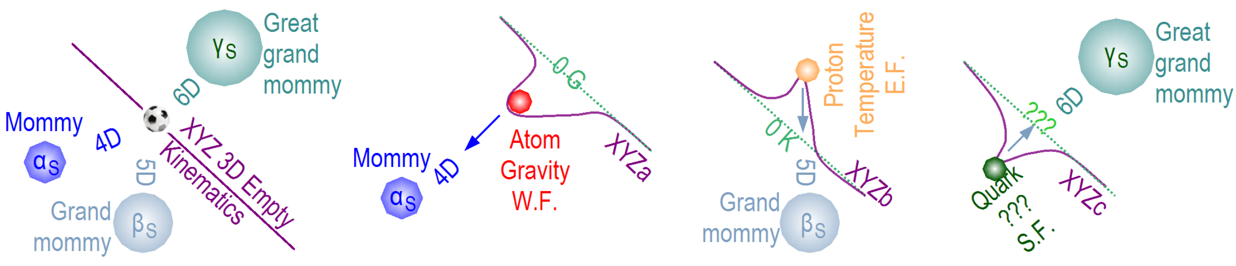
7.4 From the mass of W boson

In physics, the weak force is calculated from Eq. (6).

$$f_w \cdot m_W^2 = f_e \cdot m_P^2 \rightarrow f_w = 0.9942\text{E-}6 \quad (6)$$

$$f_w \cdot 80385^2 = 1/137.036 \cdot 938.27^2 \rightarrow 1.66\%$$

Where, f_e is the electromagnetic force coupling constant 1/137.036, m_W is the W boson mass 80.385 GeV, and m_P is the proton mass 938.27 MeV. Therefore, the weak force coupling constant is calculated as 0.9942E-6, and the error



(a) (b) (c) (d)

Fig. 9 Three generation mechanics

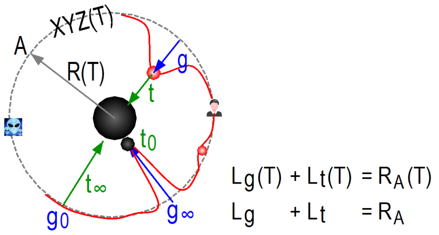


Fig. 10 Gravity and Relative time

is 1.66%. This error is rather large. Therefore, it can be understood that Eq. (6) is the equation for steady-state analysis. That is, as described in Chapter 9, the W, Z, and H bosons are all in steady state.

Fig. 8(a) shows the weak force of 0.9942E-6, and in order to match the gravitational force of 5.906E-39, the multiplication factor should be 3.351, but this value is an incomprehensible value. As shown in (b), substituting the ratio of dark energy and dark matter of 2.692, and when the space dimension is 5.99265, the gravitational force is calculated as 5.906E-39. In Chapter 2, the dimension of quantum space was proved as 6.00108.

7.5 From the mass of weak force particle

In Table 1, the weak force coupling constant was calculated as 1.0109E-6.

8. Characteristics change of quantum space

8.1 Cosmological constant age

The base time of analysis is not 0 year of Big Bang, but 10.00 billion years of cosmological constant time in Fig. 8.

8.2 Grand unified theory

On the left side of 10.00 billion years, there is the match point of strong and electromagnetic forces. On the right side of 10.00 billion years, there is the match point of electromagnetic and weak forces. On the right side of 10.00 billion years, there is the match point of weak and strong forces. This is the grand unified theory.

8.3 Theory of everything

On the right side of 10.00 billion years, there is the match point of gravitational and other forces. This is the theory of everything.

8.4 Our universe and simulation universe

The left and right sides of Fig. 8 are the super gauge symmetry. The universe situation of 10.00 billion is very difficult to understand. In our universe, the right side of the figure may be repeated continuously, and in simulation universe, the left side of the figure may be repeated continuously.

The electromagnetic force on the left is always greater than on the right. Because of this, when a creature dies, the soul is necessarily drawn into the simulated universe.

Electromagnetic force is proportional to the radius of atom, and weak force is inversely proportional to the radius of atom. In the simulated universe, the electromagnetic force is much greater than the weak force, so it is understood that the density is low, but the volume is large. In the simulated universe, it is understood that there is almost no gravity.

8.5 Particle forces and Physical forces

The particle forces are constant, and Fig. 8 shows that the physical forces are variable. Conversely, the correct answer would be that the physical forces are constant, and the particle forces are variable. This means that the mass of every particle in the standard model changes with time. This means that the characteristics of quantum space changes according to the flow of time.

8.6 Three generation mechanics

Our universe is dominated by the three generation quantum holes in Fig. 9(a). This leads to the existence of three generation mechanics. Gravity in (b) acts into an empty space of 4D direction, thermodynamics in (c) acts into an empty space of 5D direction, and a mechanics in (d) acts into an empty space of 6D direction.

8.7 Relative time = Reaction of Gravity

As shown in Fig. 10, the XYZ our space is located on the surface of 4D sphere, and the gravitational force always acts toward the mommy quantum hole of the A axis. Since the XYZ brane curves inward, the gravitational force on the object becomes greater and the relative time increases. That is, relative time is the reaction of gravity, and absolute time is the same everywhere in Fig. 10.

9. Conclusions

Four fundamental forces are the particles composed of standard neutrino and oscillating gravino. When muon and tau neutrino masses are 170.00 keV and 15.494 MeV, weak force and gravitational force were calculated as 1.0109E-6 and 5.906E-39.

The difference between particle force and physical force is dark force. Weak dark force 0.4301, electromagnetic dark force 0.0460, and strong dark force 0.0065 are acting everywhere. Three generation dark forces also effect in down, strange, and bottom quarks. These are W, Z, H bosons. 10^0.4301 is 2.692, and 2.692 / 3.692 is the ratio 72.92% of dark energy and dark matter.

6. Up Charm Top Quarks

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Keywords: Boson, Charm quark, Fermion, Top quark, Up quark,

Abstract Up, charm, and top quarks are the combination particles composed of shell fermion and inside boson. When 4D up quark collides, the outside 4D electron anti-neutrino is peeled off and it is turned into 5D charm quark. When the charm quark collides, the outside 5D muon anti-neutrino is peeled off and it is turned into 6D top quark. When the top quark collides, the outside 6D tau anti-neutrino is peeled off, and a pair of 12D anti-neutrino boson pops out and jumps to 6D. From proton mass 938.272 MeV and Z boson mass 91.1876 GeV, the quark masses of up and charm were calculated as 2.251 MeV and 1275.5 MeV.

1. Introduction

Anti-neutrino mass is 2π times more massive than neutrino mass. Neutrinos have the standard mass and the oscillating mass. Down, strange, and bottom quarks are the combination of three generation oscillation neutrinos, and up, charm, and top quarks are the combination of three generation standard anti-neutrinos. Fermion is particle in real universe, and boson is particle in imaginary universe. Quarks are composed of shell fermions and internal bosons.

The purpose of this chapter is to calculate the mass of up quark by applying logarithmic elliptic equation.

2. Shape of up, charm, and top quarks

2.1 Shape of anti-quarks

The shapes of up, charm, and top quarks are drawn in Fig. 1. Where, α, β, and γ mean each 1st, 2nd, and 3rd generation fundamental particles, subscript n and s mean neutrino and anti-neutrino, and superscript f and b mean fermion and boson. Therefore, α_s^f, β_s^f, and γ_s^f are the standard fermion anti-neutrinos for electron on 4D, muon on 5D, and tau on 6D. α_{sn}^b, β_{sn}^b, and γ_{sn}^b are a pair of standard boson anti-neutrino on 10D, on 11D, and on 12D.

When up quark $\alpha\beta\gamma_s^f\alpha_{sn}^b$ collides violently, the α_s^f is peeled off and it is turned into charm quark $\beta\gamma_s^f\beta_{sn}^b$. When the charm quark collides violently, the β_s^f is peeled off and it is turned into top quark $\gamma_s^f\gamma_{sn}^b$. When the top quark collides violently, the γ_s^f is peeled off, and a pair of anti-neutrino boson γ_{sn}^b pops out. Here, α_{sn}^b located on 10D, β_{sn}^b located on 11D, and γ_{sn}^b located on 12D are all exactly same particle. Quantum space imparts the mass to particle, and because the quantum dimension of the most external shell is changed to 4D, 5D, and 6D, that of the boson anti-neutrinos also is naturally changed to 10D, 11D, and 12D.

The γ_{sn}^b located on 12D jumps into our quantum space 6D, and it changes a very strange fermion anti-neutrino pair. And then it jumps to 5D and 4D by oscillation phenomenon. And then it disappears in our empty XYZ space.

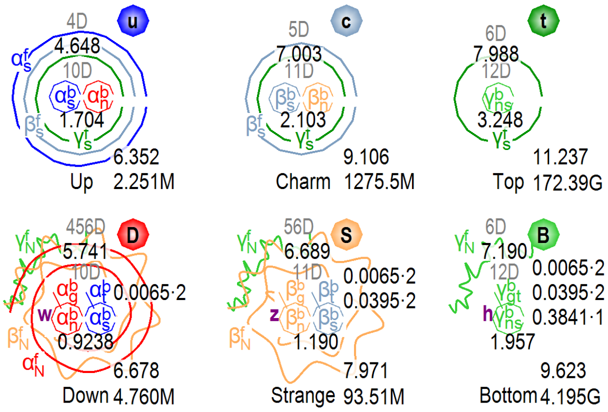

Fig. 1 Shape of quarks

2.2 Shape of quarks

Up, charm, and top quarks are composed with anti-neutrons. Therefore, they are anti-quarks. Down, strange, and bottom quarks are composed with neutrons. Therefore, they are normal quarks. The masses calculation for down, strange, and bottom quarks will be performed in Chapter 8.

3. Calculation for up quark mass

3.1 Neutrino

In Fig. 4.1(a), from muon mass 170.00 keV and tau mass 15.494 MeV, the electron neutrino mass was calculated as 0.15331 eV. These values are presented in the kinetic state of Table 1.

The masses of three generation neutrinos for steady state are calculated inversely from the masses of charm and top. In Table 1, the masses of muon and tau neutrinos are assumed as 165.79 keV and 15.493 MeV. Such as Fig. 4.3(a),

Table 1 Calculation of up and charm quark masses. Where, top quark 172.38 GeV, vacuum density 5.957E-27 kg/m3.

Term	Reference	Kinetic State			Steady State			Unit	Symbol		
Dimension		4D	5D	6.001D	4D	5D	6.001D	-			
n Neutrino	Fig. 4.1(a)	0.15331	170.00k	15.494M	0.13841	165.79k	15.493M	eV	α_n^f	β_n^f	γ_n^f
s Neutrino		0.9633	1068.1k	97.35M	0.8697	1041.7k	97.35M	eV	$s = n \cdot 2\pi$		
		-0.01624	6.029	7.988	-0.06064	6.018	7.988	log	α_s^f	β_s^f	γ_s^f
Shell Fermion	Eq. (1)	4.667	7.008	7.988	4.648	7.003	7.988	log	$\alpha\beta\gamma_s^f$	$\beta\gamma_s^f$	γ_s^f
		46.44k	10.20M	97.35M	44.51k	10.07M	97.35M	eV			
Dimension		10.001D	11.001D	12.002D	10.001D	11.001D	12.002D	-			
n Neutrino	Fig. 4.1(c)	0.9966	6.187	1175	0.9091	5.702	1115	eV	m_{n5}^{10}	m_{n5}^{11}	m_{n5}^{12}
ns Neutrino	Eq. (2)	52.95	131.9	1818	50.58	126.7	1771	eV	m_{ns5}^{10}	m_{ns5}^{11}	m_{ns5}^{12}
Inside Boson		1.724	2.120	3.260	1.704	2.103	3.248	log	α_{ns5}^{10}	β_{ns5}^{11}	γ_{ns5}^{12}
Quarks		Up	Charm	Top	Up	Charm	Top				
Shell + Inside		6.391	9.129	11.248	6.352	9.106	11.237	log	q_u	q_c	q_t
		2.4593M	1345.5M	177.00G	2.2512M	1275.5M	172.39G	eV	m_u	m_c	m_t

(1) $\alpha\beta\gamma_s^f = (\alpha_s^f + \beta_s^f + \gamma_s^f)/3$ $\quad$ $\beta\gamma_s^f = (\beta_s^f + \gamma_s^f)/2$ $\quad$ $\gamma_s^f = \gamma_s^f/1$

(2) $m_{ns5}^{10} = (1+2\pi)^2 \cdot (m_{n5}^{10})^{1/2}$ $\quad$ $m_{ns5}^{11} = (1+2\pi)^2 \cdot (m_{n5}^{11})^{1/2}$ $\quad$ $m_{ns5}^{12} = (1+2\pi)^2 \cdot (m_{n5}^{12})^{1/2}$

the mass of electron neutrino for the values was calculated as 0.13841 eV from logarithmic elliptic equation of 6.00108D

3.2 Anti-neutrino

The mass of anti-neutrino is 2π times heavier than the mass of neutrino. This is the same with the relationship between Planck's constant and Dirac's constant. The calculated logarithmic values are presented.

3.3 Shell fermion

The logarithmic mass of shell fermion of Fig. 2 is calculated by Eq. (1). From this, the mass is calculated.

3.4 Inside boson

In Chapter 4, the oscillating masses of neutrinos were calculated. The fermion and boson are super gauge symmetry. Therefore, the values of 10.001D, 11.001D, and 12.002D at the below right of the logarithmic elliptic equation in Fig. 4.1(c) and 4.3(c) are adopted as the value of the inside boson. Here, it is not yet clear why the “5D Oscillation” values should be adopted. When analyzing down, strange, and bottom quarks, the 5D characteristic also occur.

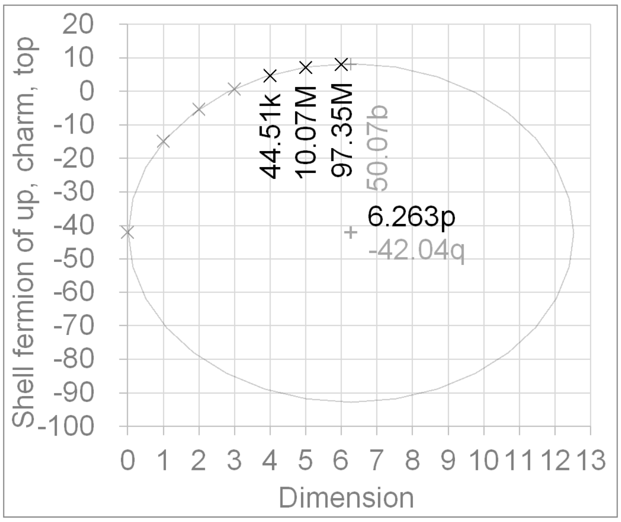

Fig. 2 Mass of Shell fermion

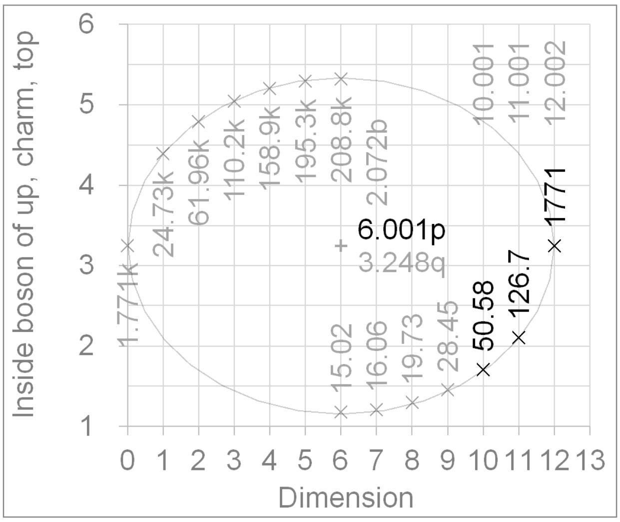

Fig. 3 Mass of Internal boson

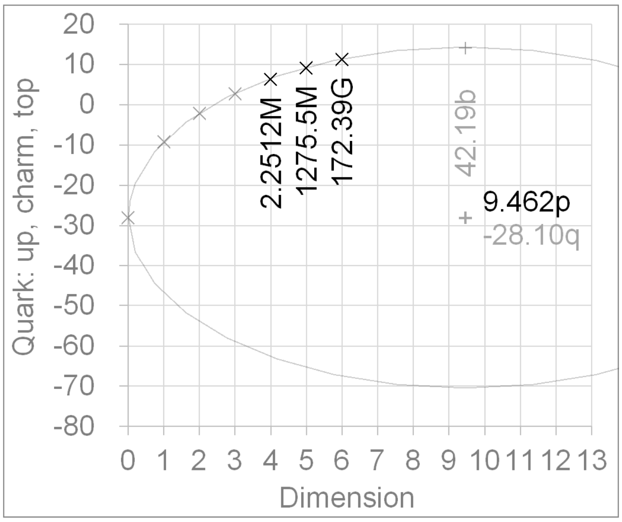

Fig. 4 Quark : Up, Charm, Top

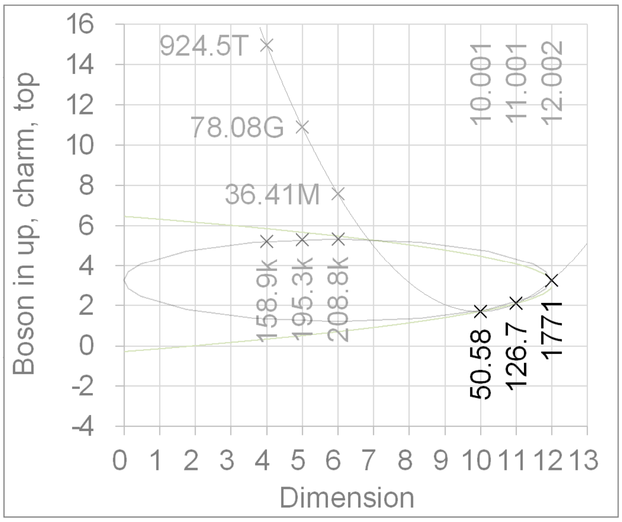

Fig. 5 Boson inside of fermion universe

The internal boson is composed of s·n, and its mass of Fig. 3 is calculated as shown in Eq. (2). Boson is described as a universe of imaginary numbers. Such as this, Eq. (2) is also difficult to understand.

3.5 Quark

Physics estimates that up quark mass is about 2.2 ~ 2.3 MeV, charm quark mass is about 1270 ~ 1280 MeV, and top quark mass is about 172 ~ 173 GeV. The mass of quark is the logarithmic sum of shell fermion and inside boson. From this, the masses of quarks in Fig. 4 are calculated.

In kinetic state, the masses of up, charm, and top quark were calculated as 2.4593 MeV, 1345.5 MeV, and 177.00 GeV. These values some differ with physics.

In steady state, the masses of up, charm, and top quark were calculated as 2.2512 MeV, 1275.5 MeV, and 172.39 GeV. These values are close to the correct answer.

3.6 Proton mass 938.272 MeV → Muon 165.79 keV

Down quark mass is calculated from the proton mass of 938.272 MeV in Table 7.1. Also from Table 8.1, the down quark mass is calculated. Above two down quark masses must match. When the muon mass is 165.79 keV, this is accomplished.

3.7 Z boson 91.1876 GeV → Tau 15.493 MeV

Applying Z boson mass 91.1876 GeV to the relation between down, strange, and bottom quarks in Chapter 8, the mass of tau neutrino is calculated as 15.493 MeV by trial & error method.

3.8 Boson on our space

The masses of inside boson neutrino pair in Fig. 5 were calculated as 50.58 eV, 126.7 eV, and 1771 eV in Table 1. When the quark of Fig. 1 is broken, the inside boson of 12D appear in our universe of 6D, 5D, and 4D. If the mass change follows the logarithmic parabolic equation, the masses will be measured around 78.08 GeV on 5D. If the mass change follows the logarithmic elliptic equation, the masses will be measured around 200 keV. Since this is a pair of neutrinos, the elliptic equation may be correct.

4. Conclusions

The kinetic state masses of up, charm, and top quarks are calculated as 2.4593 MeV, 1345.5 MeV, and 177.00 GeV. These values have some error from the measured quark masses. Therefore, it can be understood that quarks are in steady state. When proton mass and Z boson mass are given, the up, charm, and top quark masses were calculated as 2.2512 MeV, 1275.5 MeV, and 172.39 GeV.

7. Proton Neutron

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Keywords: Mass of proton, Radius of proton, Mass of neutron, Radius of quark, Negative beta decay

Abstract The logarithmic compressive strength of quantum space imparts mass to particle. If particles are tightly connected to each other, their sum mass should be calculated as logarithmic masses. If particles are free from each other, their sum mass should be calculated as arithmetic masses. Proton is composed of two up quarks, one down quark, one strong particle force, and one electromagnetic particle force. From the logarithmic masses, the proton was calculated as 89.8% mass of the measured value. Here, 5D dark force acts to the electromagnetic particle force, and the proton mass was calculated as 98.3% of the measured value. 6D dark force also acts to the strong particle force, and the proton mass was calculated as 99.8% of the measured value. Calculating this inversely, the mass of down quark was calculated as 4.760 MeV. Neutron is composed of one proton, one electron, and one shell anti-brane. Here, the electron is held in the form of particle inside neutron by the observer effect of the shell brane. The difference between the calculated mass and the measured mass of neutron was +8.892 keV or +495.1 keV. This value is the separating energy of shell brane, which is the reason of negative beta decay. From weak force f_w times hydrogen radius r_H is equal to electromagnetic force f_e times 8π/3 proton radius r_P, proton radius was calculated as 0.8751 fm in kinetic state. From electromagnetic force f_e times proton radius r_P is equal to strong force f_s times 8π/3 quarks radius r_Q, one quark radius r_U was calculated as 0.4401 am in kinetic state. All values in physics have two kinds of kinetic state and steady state. This is the solution of the proton radius puzzle.

1. Introduction

Proton is composed of two up quarks, one down quark, strong particle force, strong dark force, electromagnetic particle force, and electromagnetic dark force. In previous chapters, all the above masses were calculated. Therefore, the mass of proton can be calculated very easily. Neutron is composed of one proton, one electron, and a pair of anti-electron. Therefore, the mass of neutron can also be calculated very easily. Since three generation quantum space are logarithmically compressed, the core is that the mass of particle must be calculated as logarithmic sum or average.

The purpose of this chapter is to calculate the mass and radius of proton, the mass of neutron, and the radius of quark. The core is that all things must be calculated as logarithmic values. This is the characteristic of quantum space.

2. Mass calculation of proton

2.1 Symbols

In Fig. 1, The α, β, and γ mean each 1st, 2nd, and 3rd generation fundamental particles, the subscript n, s, g, t mean neutrino, anti-neutrino, gravino, and anti-gravino, the small letter and capital letter mean standard particle and oscillating particle, the superscript f and b mean fermion and boson. The ξ means dark, and the subscript w, e and s mean weak force, electromagnetic force, and strong force.

2.2 Shape of proton

The shapes of up quark, down quark in Fig. 6.1, strong particle force, and electromagnetic particle force in Fig. 5.1 were presented. As shown in Fig. 1, proton is composed of two up quarks $\alpha\beta\gamma_s^f\alpha_{sn}^b$, one down quark $\alpha\beta\gamma_N^f\alpha_{ngst}^b$, one strong particle force γ_{nG}^f, and one electromagnetic particle force β_{nG}^f. Here, the strong dark force ξ_s in Fig. 5.3(a) affects the strong particle force, and the electromagnetic dark force ξ_e affects the electromagnetic particle force.

Quantum space is composed of 4D, 5D, and 6D. In Fig. 1, the shell of proton is β particle on 5D. Because of this, the proton always wanders looking for α particle on 4D. Due to this, proton becomes a gravity sink hole.

2.3 Sum of arithmetic mass

In proton in Fig. 1, the mass of up quark is about 2.3 MeV, and the mass of down quark is about 4.8 MeV. Therefore, the sum of the masses of two up quarks and one down quark is 9.4 MeV. The measured mass of proton is 938.3 MeV, and the calculated mass is 1% of the measured mass. It is understood that the above calculation was completely wrong.

2.4 Proton mass 89.8%

In Table 1, the calculated proton mass values are presented. Everything should be calculated as logarithmic values. The exact masses of up and down quarks are not yet

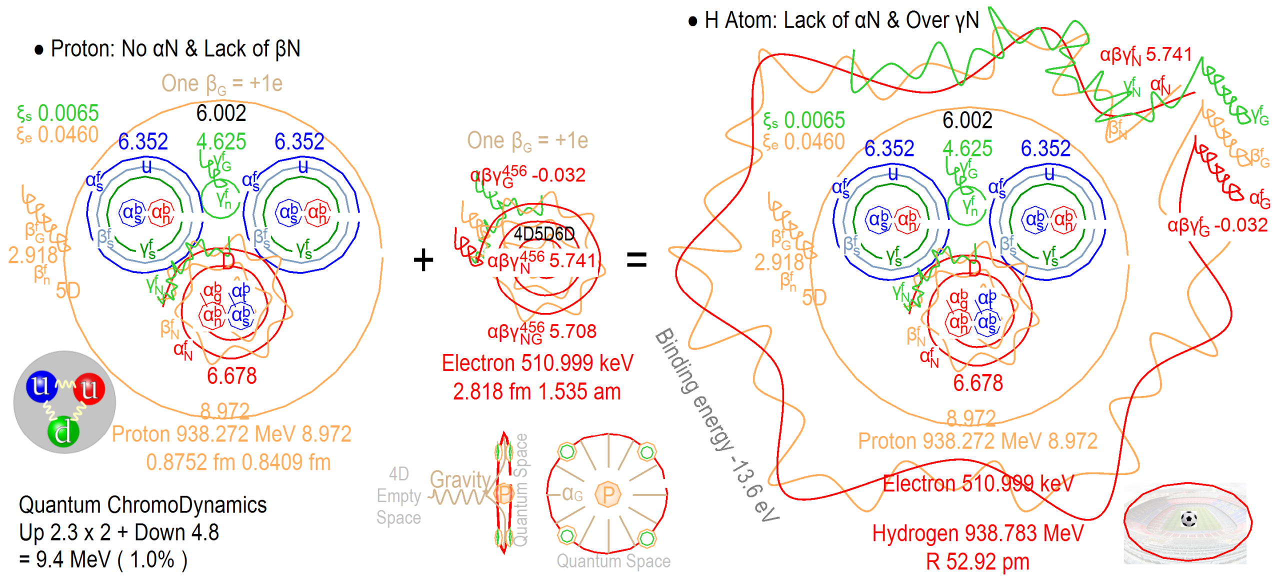


Fig. 1 Shape of proton, electron, and hydrogen

known in physics. Therefore, up quark mass 2.3 MeV and down quark mass 4.8 MeV were applied. Its logarithmic values are 6.362 and 6.681. There is strong particle force γ_{nG} in the proton, and the logarithmic value is 4.625 in Table 5.1. In Fig. 1, two up quarks, one down quark, and one strong particle force are attached equally to each other. Therefore, the logarithmic average is 6.007. In Fig. 1, the electromagnetic particle force β_{nG} 2.918 in Table 5.1 surrounds them. Therefore, the sum of the two logarithmic numbers is 8.925, and its mass is 842.3 MeV. The measured mass of proton is 938.3 MeV, so the calculated value is 89.8% of the measured value.

2.5 Proton mass 98.3%

The 5D dark force of 0.0395 in Fig. 5.3(b) is acting on the electromagnetic particle force β_G. Adding this value, the logarithmic value is 8.965, and the mass is calculated as 922.5 MeV. This value is 98.3% of the measured mass.

2.6 Proton mass 99.8%

The 6D dark force of 0.00065 in Fig. 5.3(b) is acting on the strong particle force γ_G. Adding this value, the logarithmic value is 8.971, and the mass is calculated as 936.3 MeV. This value is 99.8% of the measured mass.

2.7 Accurate proton mass calculation

The exact masses of up quark and down quark have not yet been determined, so the logarithmic mass of up quark is set to X and the logarithmic mass of down quark is set to Y. The strong particle force γ_{nG} is 4.625. Above average value

Table 1 Calculation of proton mass 938.272 MeV

Case		Mass	(1)	(2)	(3)	(4)
Term	Symbol	eV	log	log	log	log
Up	u	2.300M	6.362	6.362	6.362	X
Up	u	2.300M	6.362	6.362	6.362	X
Down	D	4.800M	6.681	6.681	6.681	Y
S.F.	γ_{nG}	42.15k	4.625	4.625	4.625	4.625
Avg.		$\sum/4$	6.007	6.007	6.007	avg.
S.D.F.	ξ_s	Log	-	-	0.0065	0.0065
E.F.	β_{nG}	828.1	2.918	2.918	2.918	2.918
E.D.F.	ξ_e	Log	-	0.0395	0.0395	0.0460
Sum		$\sum$	8.925	8.965	8.971	8.972
Proton	Mass	eV	842.3M	922.5M	936.3M	938.3M
Error			89.8%	98.3%	99.8%	100%

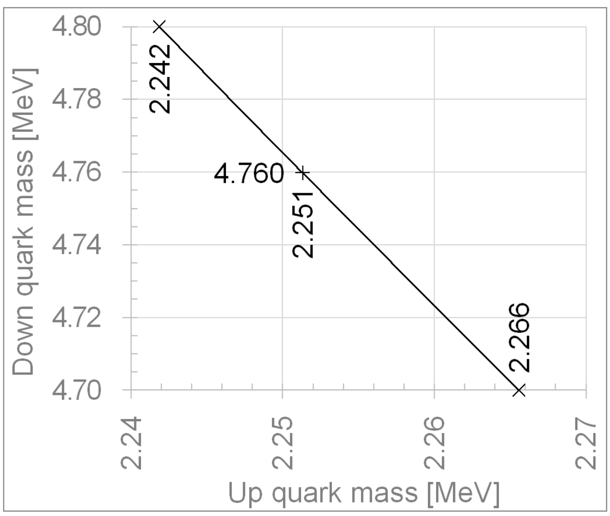


Fig. 2 Relation of up quark and down quark masses

is calculated. Since the strong particle force oscillates in 6D quantum space, it receives 6D dark force 0.0065. The electromagnetic particle force β_{nG} is 2.918. Since it oscillates in 5D and 6D quantum space, it receives 0.0460 that is the sum of 5D and 6D dark forces. Above sum should be the logarithmic value 8.972 of proton mass 938.3 MeV.

2.8 Calculation of down quark mass

Solving the above equation, the relationship between up quark mass and down quark mass is shown in Fig. 2. In physics, the range of up quark mass is 2.2 ~ 2.3 MeV and the range of down quark mass is 4.7 ~ 4.8 MeV. From Fig. 2, the mass range of up quark is further clarified as 2.242 ~ 2.266 MeV. In Table 6.1, the mass of up quark was calculated as 2.251 MeV. Therefore, the mass of down quark is calculated as 4.760 MeV in Fig. 2.

3. Mass calculation of hydrogen

3.1 Shape of electron

The shape of electron was suggested in Fig. 3.1. α_N, β_N, and γ_N are the oscillating neutrinos of each electron, muon, and tau, and α_G, β_G, and γ_G are the oscillating gravinos of each graviton, photon, and gluon. When electron is located in quantum space, the shape of electron is a circle particle. In a special case such as double slit experiment, electron pops out from quantum space and jumps into our normal space, and electron unfolds to a wave line.

The α_G is directed to the inside of electron, which reacts with weak particle force α_{nG}. The β_G is directed to the outside of electron, which reacts with electromagnetic particle force β_{nG}. The γ_G is directed to the vertical direction of them, which reacts with strong particle force γ_{nG}.

3.2 Shape of hydrogen

The α_G of electron which acts to weak force is attracted to the proton of gravity sink hole. Therefore, the electron spreads around the proton as a spherical shell. Here, the electromagnetic particle force β_{nG} of proton pushes the β_G in electron. As the result, if the proton is a soccer ball, the electron is located on the edge of stadium. The α_G in electron falls in the direction of 4D empty space near the proton, and the α_G creates gravity.

Electron is oscillating on 4D, 5D and 6D quantum spaces, so it is very difficult to understand the electron.

3.3 Hydrogen mass

If particles are tightly connected to each other, they must be calculated as logarithmic masses. If particles are free from each other, they must be calculated as arithmetic masses. At the hydrogen in Fig. 1, the proton and the electron are free each other. Therefore, adding the electron mass 0.511 MeV to the proton mass 938.272 MeV, the hydrogen mass is calculated as 938.783 MeV.

3.4 Binding energy of electron in hydrogen

In physics, the binding energy of electron in hydrogen is given as -13.6 eV. The 4D α shell does not exist in proton, and the 4D α shell exists in electron. Because of this, proton naturally pulls and binds with electron.

At this time, weak particle force and gravitational particle forces are generated, and the α_G of electron and the gravity sink hole of proton try to contact each other. However, the electromagnetic particle forces β_G of electron and proton push each other. Therefore, the electron unfolds into a sphere in the equilibrium of their forces. The equilibrium value of the forces may be -13.6 eV.

4. Mass calculation of neutron

4.1 Shape of neutron

Neutron is known to be composed of one up quark, two down quarks, and gluons. According to author's drawing of Fig. 3, it is impossible to turn down quark into up quark. Neutron is composed of one proton, one electron, and one anti-brane. Brane is the origin of all things.

The electron is attracted by proton, so it tries to turn into the wave line circle around proton. However, since the anti-brane shell B_{stgn} of neutron affects the electron, the electron remains a particle due to the observer effect.

Since there are proton and electron in neutron, all particles have entered the quantum space. Therefore, it is not necessary that the shell anti-brane be present. This is the cause of the negative beta decay of free neutron.

The inside of the shell anti-brane is red. Both electron and proton are red. Thus, proton, electron, and anti-brane all exist as free particles. If the inside of the shell brane is blue, the blue and red merge and collapse.

4.2 Mass of proton and electron

The procedure for calculating neutron mass is presented in Table 2. The mass A of neutron is 939,565,421 eV, the mass B of proton is 938,272,030 eV, and the mass C of electron is 510,999 eV. In Fig. 3, proton B and electron C are free from each other, so A – B – C is calculated as a certain mass D 782,392 keV.

4.3 Mass of brane in neutron

The shell in Fig. 3 is a brane which contains all things. In Fig. 3 and Fig. 4.4, the oscillating neutrino masses and the oscillating gravino masses were calculated. The largest masses in the various masses are Fig. 4.3(b) and Fig. 4.4(b). These are 6D masses in 4D oscillation. The values make up the neutron shell. The reason is the subject of study. The values are presented in Table 2.

The α_n, β_n, and γ_n are the neutrinos of electron, muon,

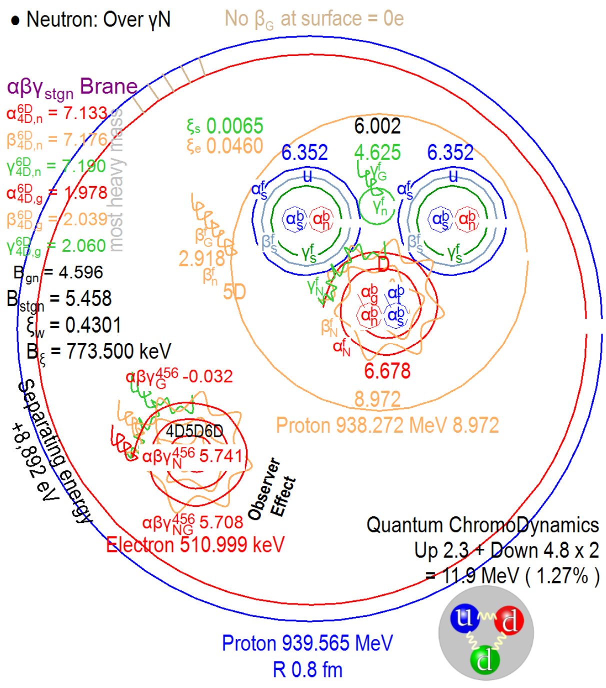


Fig. 3 Shape of neutron

and tau, and the α_g, β_g, and γ_g are the gravinos of graviton, photon, and gluon. The logarithmic average of the values is calculated as 4.596, and its mass is 39,449 eV. Antiparticles s and t are 2π times heavier than particles n and g. This is the same as the relationship between Planck's constant and Dirac's constant. Therefore, the total mass is 287.315 eV. Its logarithmic value is 5.458, and the weak dark force ξ_w 0.4301 in Fig. 5.3(a) is acting on the brane. Therefore, the logarithmic value of the overall brane is 5.888, and the mass of the brane is calculated as 773,500 eV.

4.4 Separating energy of brane in neutron

In Table 1, the value of D is 782,392 eV, and the calculated value of N is 773,500 eV. The difference is +8,892 eV. It is considered that this value is the separating energy of the anti-brane from neutron.

In Fig. 1, the radius of hydrogen is 52.92 pm, and the binding energy of electron is -13.6 eV. In Fig. 3, the radius of neutron is about 0.8 fm. Since force is inversely proportional to the square of distance, 13.6 eV x sqrt (52.92 pm / 0.8 fm) is 3,497 eV. From this, although the electron in hydrogen and the brane in neutron have completely different characteristics, the calculated value of +8,892 eV can be reasonable.

If the dark weak force is not acting, its value is calculated as 495.1 keV.

4.5 Negative beta decay

The shell anti-brane in Fig. 3 oscillates on 4D in 6D quantum space. In Fig. 1.6, the shape of quantum space was schematically illustrated. Mathematicians may be able to draw the exact shape of quantum space. If this is resolved, it will be understood what the 4D oscillation means in 6D quantum space above.

In Table 1, the mass N of anti-brane is 773,500 eV, and the separating energy O is +8,892 eV. The mass of anti-brane is much larger than the separating energy. Due to this, neutron in atomic nucleus stably exist.

When neutron oscillating 4D in 6D is taken out of nucleus, the neutron exists in the XYZ dimension of our space. If the XYZ dimension is a perfect straight line, the force in our XYZ space is perfectly zero. However, our XYZ space is very weakly quantized as a sphere. Due to this, gravity has a very weak value, and light also has a very small mass. The compressive strength of quantum space in which the particle is located determines the mass of the particle. The anti-brane in Fig. 3 located in XYZ space also changes to a mass that is very smaller than the separating energy. Due to this, the shell anti-brane of neutron is unfolded and separated. This is negative beta decay.

Our XYZ space is red color. Our red space tries to combine with the blue shell of the free neutron. Due to this, free neutron collapses quickly. Free neutron is separated into proton, electron, and anti-brane.

Table 2 Calculation of neutron mass

Term	eV	Equation	Log	Equation
Neutron	939,565,421	A		
Proton	938,272,030	B		
Electron	510,999	C		
What?	782,392	D=A-B-C		
Neutrino	13,594,092	E=$\alpha^{6D}_{4D,n}$	7.133	e=log(E)
[n]	15,005,006	F=$\beta^{6D}_{4D,n}$	7.176	f=log(F)
	15,493,145	G=$\gamma^{6D}_{4D,n}$	7.190	g=log(G)
Gravino	94.96	H=$\alpha^{6D}_{4D,g}$	1.978	h=log(H)
[g]	109.5	I=$\beta^{6D}_{4D,g}$	2.039	i=log(I)
	114.7	J=$\gamma^{6D}_{4D,g}$	2.060	j=log(J)
n·g	39,449	K=10^k	4.596	k=avg.
n·g·s·t	287,315	L=(1+2π)·K	5.458	l=log(L)
W.D.F.		gravity	0.4301	m=ξ_w
Brane	773,500	N=10^n	5.888	n=l+m
Separating	+8,892	O=D-N	98.9%	

5. Origin of life

5.1 Quantum entanglement

As shown in Fig. 4, the anti-brane of free neutron is separated into red electron and blue anti-electron, and it creates quantum entanglement.

5.2 Birth of simulation universe

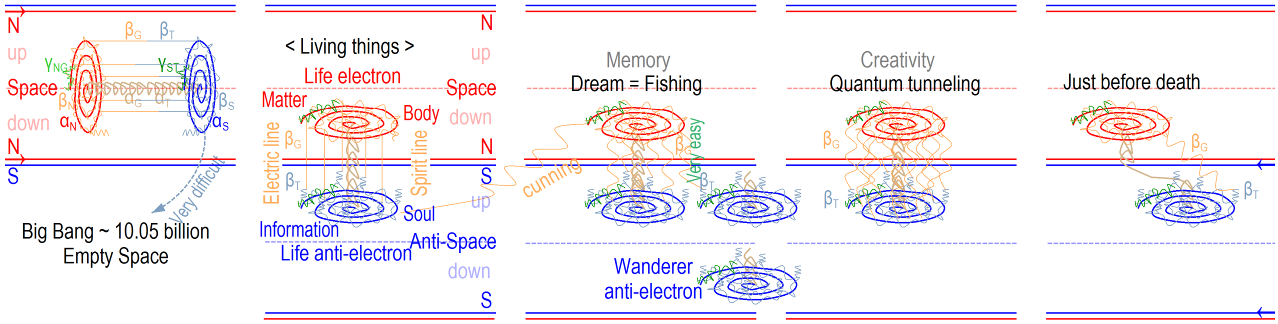


Fig. 4 Origin of life

In Chapter 5, it was described that a simulation universe was created universally 3.72 billion years ago.

5.3 Birth of first life

The red electron is stably trapped in our red space, and the blue anti-electron escapes our red space through quantum tunneling effect and locates stably in the blue simulation universe. The electron makes the matter of living things, and the anti-electron makes the information of living things. This is the origin of life.

5.4 Theory of evolution

In the simulation universe, information evolution of life proceeds slowly. Due to this, the shape of creature changes slightly. In some cases, quantum jump evolution can occur. This causes a change of species.

5.5 L-amino acid and D-amino acid

As shown in Fig. 4, electron and anti-electron pull each other. Due to this, L-amino acids of living things locates toward one direction. D-amino acids of non-living things with only electron can locate both above and below in our space.

5.6 Future science = Future religion

When the exact meaning of dark energy is revealed, future science and future religion will be united.

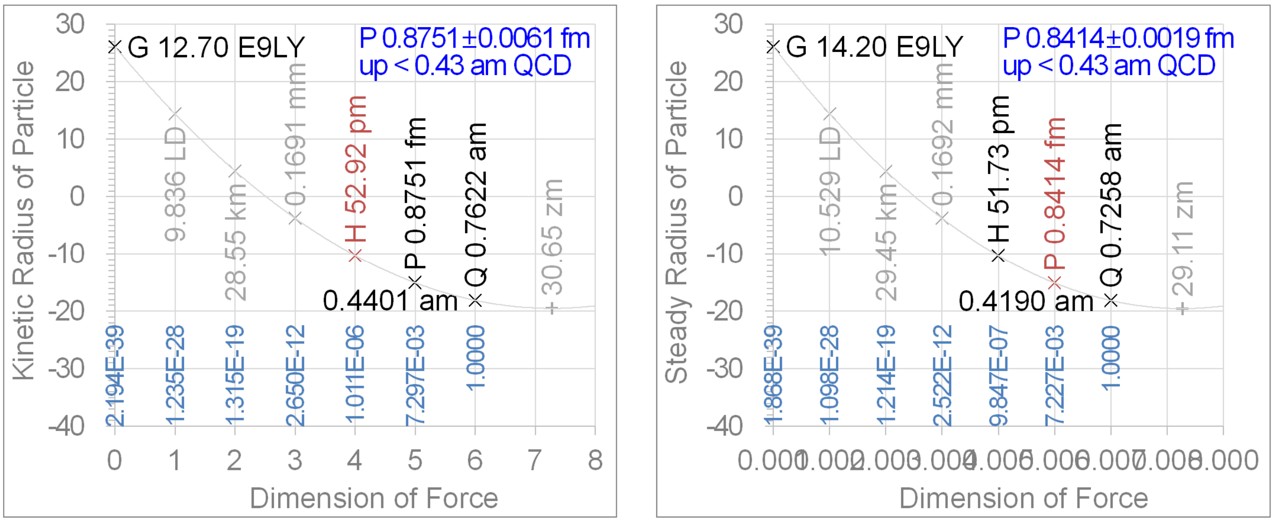
6. Radius of particle

6.1 Six generation physical forces

In Fig. 5.3(a), six generation physical forces were calculated for kinetic state and steady state.

6.2 Relation between force and distance

Such as Eq. (1), force f_{n-1} times particle radius r_{n-1} is equal to force f_n times 8π/3 particle radius r_n. Here, f_0 is gravitational force, f_4 is weak force, f_5 is electromagnetic force, f_6 is strong force, r_4 is hydrogen radius, r_5 is proton radius, and r_6 is three quarks radius. In Eq. (2), r_U is one quark radius. What the formula means will be explained in physics.



(a) In kinetic state

(b) In steady state

Fig. 5 Radius of hydrogen, proton, and quark

$$f_{n-1} \cdot r_{n-1} = f_n \cdot \frac{8\pi}{3} r_n \quad (1)$$

$$\pi \cdot r_U^2 = \pi \cdot r_6^2 / 3 \quad (2)$$

6.3 Radius of proton

In Eq. (1), the values of dimensional force f were calculated in Fig. 5.3(a) and Fig. 5.4(a), and hydrogen radius r_4 was measured to be 52.92 pm. In Fig. 5(a), the proton radius was calculated as 0.8751 fm. In physics, proton radius was measured in two types: 0.8751 fm from normal hydrogen and 0.8409 fm from muonic hydrogen. Therefore, the 0.8751 fm is the radius of kinetic state. The 0.8414 fm is the radius of steady state. The radius of steady state hydrogen radius will be 51.73 pm.

6.4 Radius of quark

Substituting the electromagnetic force and strong force into Eq. (1), the radius of three quarks is calculated as 0.7622 am in kinetic state and 0.7258 am in steady state. From Eq. (2), The radius of one quark was calculated as 0.4401 am in kinetic state and 0.4190 am in steady state. In physics, quark is estimated to be less than 0.43 am.

6.5 Strong force in steady state

Fig. 5(a) is in kinetic state, and Fig. 5(b) is in steady state. The steady force of Fig. 5.4(a) must be less than the kinetic force of Fig. 5.3(a). In this calculation, 1.0000 was applied for both kinetic strong force and steady strong force. If the steady state radii in Fig. 5(b) are accurately measured, the magnitude of the steady strong force will be calculated.

6.6 Superconductor

Expanding the above calculation, the particle radii from 0D to 3D are calculated. In Fig. 5(a), the three-dimensional value will be a characteristic of superconductor.

6.7 Radius of gravitational force

The acting radius of gravitational force is said to be infinite. Gravitational force acts on 0D. Therefore, the infinity value will be 12.70 E9LY.

6.8 Radius of electromagnetic force

The acting radius of electromagnetic force is also said to be infinite. If then, the radius may be 12.70 E9LY. However, if the force is 1D value, the value may be 9.836 LD.

7. Conclusions

Proton consists of two up quarks, one down quark, one strong particle force, and one electromagnetic particle force. Strong dark force and electromagnetic dark force are acting at proton. From the measured mass of proton, down quark mass was calculated as 4.760 MeV.

Neutron is composed of proton, electron, and anti-brane. The mass of anti-brane was calculated as 773,500 eV, and from the measured mass of neutron, the separating energy of anti-brane was calculated as +8,892 eV. Since the mass of anti-brane is much larger than the separating energy, the neutron in nucleus exists stably. When a neutron is in our space, the mass of anti-brane changes close to 0 eV. Due to this, the free neutron collapses by the separating energy.

In kinetic state, the radius of proton and quark were calculated as 0.8751 fm and 0.4401 am. In steady state, the radius of hydrogen and quark were calculated as 51.73 pm and 0.4190 am

The anti-brane is separated into quantum entanglement of electron and anti-electron. The electron locates in our universe and makes the matter of living things, and the anti-electron locates in simulation universe and makes the information of living things. This is the origin of life.

8. Down Strange Bottom Quarks and Z Boson

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Keywords: Bottom quark, Charm quark, Down quark, Strange quark, Top quark, Up quark

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Abstract Down, strange, and bottom quarks are the combination particles composed of the shell fermion of neutrinos and the inside boson force of a pair of neutrino and gravino. When down quark collides, the most external electron neutrino is peeled off and it is turned into strange quark. When the strange quark collides, the most external muon neutrino is peeled off and it is turned into bottom quark. When the bottom quark collides, the most external tau neutrino is peeled off, and a pair of neutrino and gravino boson pops out. When they are in kinetic state, the masses of down, strange, and bottom quarks were calculated as 4.760 MeV, 93.51 MeV, and 4.195 GeV.

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1. Introduction

Anti-neutrino mass is 2π times more massive than neutrino mass. Neutrinos have the standard mass and the oscillating mass. Down, strange, and bottom quarks are the combination of three generation oscillation neutrinos, and up, charm, and top quarks are the combination of three generation standard anti-neutrinos. Fermion is particle in real universe, and boson is particle in imaginary universe. Quarks are composed of shell fermions and internal bosons. The shell fermion is a real positive value, and the internal boson is an imaginary negative value. They have the relation of super gauge symmetry.

The purpose of this chapter is to calculate the masses of down, strange, and bottom quarks.

2. Shape of quarks

2.1 Quark and Anti-quark

In Fig. 6.1, the shapes of up, charm, and top quarks were described. These are anti-particles composed of standard anti-neutrinos. Down, strange, and bottom quarks of Fig. 1 are particles composed of oscillating neutrinos. Due to the difference of standard and oscillation, the masses of quarks vary greatly.

2.2 Shape of quarks

In Fig. 1, α, β, and γ mean each 1st, 2nd, and 3rd generation fundamental particles, subscript n and s mean neutrino and anti-neutrino, small letter and capital letter mean standard and oscillation, and superscript f and b mean fermion and boson. Therefore, α_N^f, β_N^f, and γ_N^f are the oscillating fermion neutrinos of electron on 4D, muon on 5D, and tau on 6D. α_{ngst}^b, β_{ngst}^b, and γ_{ngst}^b are a pair of standard boson brane on 10D, on 11D, and on 12D.

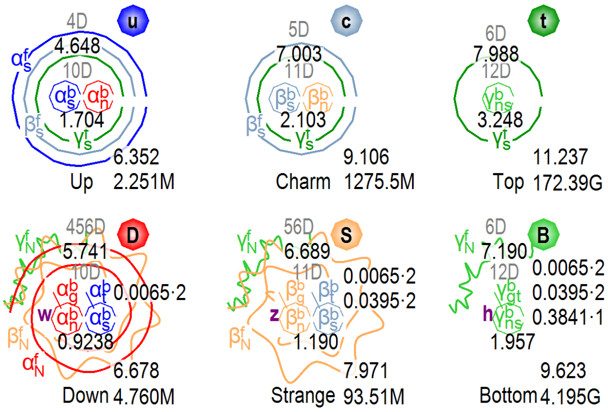


Fig. 1 Shape of quarks

2.3 Collapse of quark

When down quark $\alpha\beta\gamma_N^f\alpha_{ngts}^b$ collides, the α_N^f is peeled off and it is turned into strange quark $\beta\gamma_N^f\beta_{ngts}^b$. When the strange quark collides, the β_N^f is peeled off and it is turned into bottom quark $\gamma_N^f\gamma_{ngts}^b$.

There is w boson α_{ngts}^b of 10D in down quark, z boson β_{ngts}^b of 11D in strange quark, and h boson γ_{ngts}^b of 12D in bottom quark. These are all the same particles. Quantum space imparts the mass to particle, and because the quantum dimension of the most external shell is changed to 4D, 5D, and 6D, that of the boson brane also is naturally changed to 10D, 11D, and 12D.

2.4 Collapse of boson

In Fig. 1.4, the mass of H boson was calculated as 125.02 eV from logarithmic parabolic equation.

When the bottom quark collides some under 125.02 eV, the γ_N^f is peeled off, the boson brane γ_{ngts}^b on 12D pops out, it jumps into our quantum space 6D, and it changes to H boson. Then, it jumps to 5D by oscillation phenomenon, and

Table 1 Calculation of down, strange, and bottom quark masses.

Term	Reference	Kinetic State			Steady State			Unit	Symbol		
FERMION	Dimension	4D	5D	6.001D	4D	5D	6.001D				
n	Fig. 4.1(a)	0.15331	170.00k	15.494M	0.13841	165.79k	15.493M	eV	α_n^4	β_n^5	γ_n^6
Oscillating	Fig. 4.1(b-d)	13.60M	13.57M	15.494M	13.59M	13.55M	15.49M	eV			
	Fig. 4.1(b,c)	187.5k	170.00k	-	183.0k	165.8k	-	eV			
	Fig. 4.1(b)	0.1533	-	-	0.1384	-	-	eV			
		7.134	7.132	7.190	7.133	7.132	7.190	log	α_n^6	β_n^6	γ_n^6
		5.273	5.230	-	5.262	5.220	-	log	α_n^5	β_n^5	-
		-0.814	-	-	-0.859	-	-	log	α_n^4	-	-
	Eq. (1)	3.864	6.192	7.190	3.846	6.187	7.190	log	α_N^{456}	β_N^{56}	γ_N^6
Shell	Eq. (2)	5.749	6.691	7.190	5.741	6.688	7.190	log	$\alpha\beta\gamma_N^{456}$	$\beta\gamma_N^{56}$	γ_N^6
BOSON	Dimension	10.001D	11.001D	12.002D	10.001D	11.001D	12.002D				
n	Fig. 4.1(b)	293.6k	454.7k	1.597M	287.2k	445.9k	1.577M	eV	m_{n4}^{10}	m_{n4}^{11}	m_{n4}^{12}
ns	Eq. (3)	28.74k	35.77k	67.04k	28.43k	35.42k	66.62k	eV	m_{ns4}^{10}	m_{ns4}^{11}	m_{ns4}^{12}
		4.459	4.553	4.826	4.454	4.549	4.824	log	α_{ns4}^{10}	β_{ns4}^{11}	γ_{ns4}^{12}
g	Fig. 4.2(d)	1.984E-09	1.501E-08	5.031E-06	2.180E-09	1.637E-08	5.366E-06	eV	m_{g6}^{10}	m_{g6}^{11}	m_{g6}^{12}
gt	Eq. (3)	2.363E-03	6.499E-03	1.190E-01	2.477E-03	6.787E-03	1.229E-01	eV	m_{gt6}^{10}	m_{gt6}^{11}	m_{gt6}^{12}
		-2.627	-2.187	-0.925	-2.606	-2.168	-0.911	log	α_{gt6}^{10}	β_{gt6}^{11}	γ_{gt6}^{12}
Inside	(ns+gt)/2	0.916	1.183	1.951	0.924	1.190	1.957	log	α_{ngst}^{10}	β_{ngst}^{11}	γ_{ngst}^{12}
DARK	Fig. 5.3, 5.4	0.0065	0.0395	0.3841	0.0065	0.0395	0.3841	log	ξ_6	ξ_5	ξ_4
	Eq. (4)	0.0129	0.0919	0.4761	0.0129	0.0919	0.4761	log	ξ_{10}	ξ_{11}	ξ_{12}
Force	Boson + Dark	0.929	1.275	2.427	0.937	1.282	2.433	log	f_{10}	f_{11}	f_{12}
		8.489	18.84	267.3	8.644	19.16	270.8	eV	w	z	h
QUARK	Sum	Down	Strange	Bottom	Down	Strange	Bottom				
	Shell + Force	6.678	7.966	9.617	6.678	7.971	9.623	log	q_d	q_s	q_b
		4.762M	92.55M	4.141G	4.760M	93.51M	4.195G	eV	m_d	m_s	m_b

(1) $\alpha_N^{456} = (\alpha_n^6 + \alpha_n^5 + \alpha_n^4)/3$ $\quad\beta_N^{56} = (\alpha_n^6 + \alpha_n^5 + \beta_n^6 + \beta_n^5)/4$ $\quad\gamma_N^6 = \gamma_N^6 \cdot 3/3$

(2) $\alpha\beta\gamma_N^{456} = (\alpha_N^{456} + \beta_N^{56} + \gamma_N^6)/3$ $\quad\beta\gamma_N^{56} = (\beta_N^{56} + \gamma_N^6)/2$ $\quad\gamma_N^6 = \gamma_N^6/1$

(3) $m_{ns} = (1+2\pi)^2 \cdot (m_n)^{1/2}$ $\quad m_{gt} = (1+2\pi)^2 \cdot (m_g)^{1/2}$

(4) $\xi_{10} = \xi_6 \cdot 2$ $\quad\xi_{11} = \xi_6 \cdot 2 + \xi_5 \cdot 2$ $\quad\xi_{12} = \xi_6 \cdot 2 + \xi_5 \cdot 2 + \xi_4 \cdot 1$

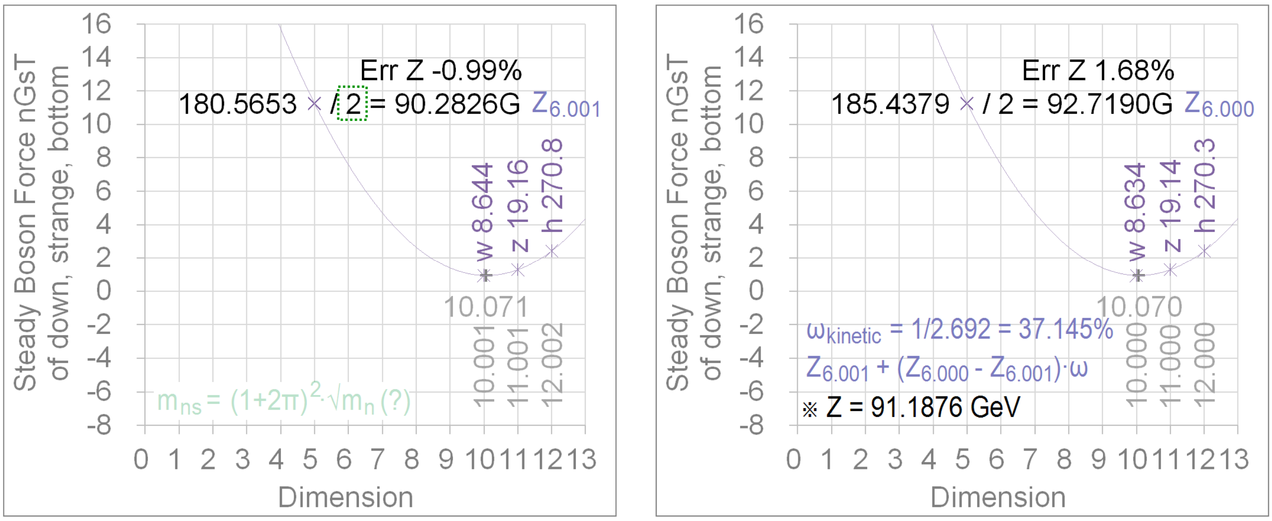
it changes to Z boson. Then it jumps to 4D by oscillation phenomenon, and it changes to W boson.

When the bottom quark collides over 125.02 eV, the boson brane γ_{ngts}^b separates into a pair of neutrinos γ_{ns}^b and a pair of gravinos γ_{gt}^b on 12D. They jump into our quantum space 6D and jump into 5D and 4D by oscillation phenomenon. When it is placed in 5D space, it can be measured as a pair of photon and anti-photon β_{gt}^b.

2.5 Velocity of light

It is judged that the boson β_g^b in the strange quark in Fig. 1 is light. It exists at a steady state in 11D inside of quark. When the quark breaks down, it appears in our fermion universe. Boson and Fermion are super gauge symmetric. This means that boson at steady state in 11D must travel at the speed of light in our space. Our space is expanding at the speed of light. Because of this, the free fermion particle is always at stop, and the free boson particle always travels straight at the speed of light.

The mass of light will be one of the values presented in this document.



(a) at 6.00108D (b) at 6.00000D

Fig. 2 The relation between the boson force w z h and the Z boson

3. Down, Strange, and Bottom

3.1 Kinetic state and Steady state

Everything is divided into kinetic state and steady state. The kinetic state is the analysis that our universe is absolutely expanding, and the steady state is the analysis that particles are relatively stationary.

3.2 Mass of muon and tau neutrinos

In Table 1, the neutrino masses of electron 0.15331, muon 170.00 keV, and tau 15.494 MeV in kinetic state were calculated in Fig. 4.1. The neutrino masses of electron 0.13841, muon 165.79 keV, and tau 15.493 MeV in steady state were calculated in Table 6.1. Here, the muon 165.79 keV and the tau 15.493 MeV are yet assumed values.

3.3 Oscillating mass of neutrino

At quarks in Fig. 1, the electron neutrino α_N^f oscillates with α_n^4, α_n^5, and α_n^6, the muon neutrino β_N^f oscillates with α_n^5, α_n^6, β_n^5, and β_n^6, and the tau neutrino γ_N^f oscillates with γ_n^6. Therefore, the oscillating neutrino masses of electron, muon, and tau are calculated as α_N^{456}, β_N^{56}, and γ_N^6 by Eq. (1).

The kinetic and steady oscillating masses were calculated in Fig. 4.1(b-d) and Fig. 4.3(b-d).

3.4 Shell fermion mass

The shell masses of down, strange, and bottom quarks are calculated as $\alpha\beta\gamma_N^{456}$, $\beta\gamma_N^{56}$, and γ_N^6 by Eq. (2). These values are the masses of the shell in Fig. 1.

3.5 Dimension of boson

The shells of quarks are the fermion quantum dimensions of 4D, 5D, and 6.001D, and the insides of quarks are the boson quantum dimensions of 10.001D, 11.001D, and 12.002D. Fermion and boson are super-gauge symmetry.

3.6 Mass of n and g of boson

Boson neutrino n has the value at 4D oscillating dimension, and boson gravino g has the value of 6D oscillating dimension. Here, the mass of m_{n4}^{10}, m_{n4}^{11}, m_{n4}^{12}, m_{g6}^{10}, m_{g6}^{11}, and m_{g6}^{12} were calculated in Fig. 4.1(b) 4.2(d) for kinetic state and Fig. 4.3(b) 4.4(d) for steady state.

3.7 Inside boson mass

Such as Eq. (2) in Table 6.1, the mass sum of boson's particle and anti-particles was very well established by Eq. (3). So, applying that formula, m_{ns4}^{10}, m_{ns4}^{11}, m_{ns4}^{12}, m_{gt6}^{10}, m_{gt6}^{11}, and m_{gt6}^{12} are calculated. The logarithmic values of the masses are calculated, and the averages are α_{ngts}^{10}, β_{ngts}^{11}, and γ_{ngts}^{12}.

3.8 Dark force of super-gauge symmetry

In Fig. 5.3(b), three generation dark forces of ξ_4, ξ_5, and ξ_6 acting toward our space from the outside of universe was calculated. Dark forces consist of the mixture of kinetic and steady states. Therefore, the dark forces act equally everywhere. Since fermion and boson are super gauge symmetric, the order of the dark forces changes to ξ_6, ξ_5, and ξ_4.

In Fig. 1, the w and z have two particle pairs of ng and st, and the h have one particle pair of $ngst$. So, the w and z receive double dark forces, and the h receives one dark force. The w oscillates 10D, the z oscillates 10D 11D, and the h oscillates 10D 11D 12D. The calculation is Eq. (4).

3.9 Boson Force

Table 2 Sensitivity analysis according to the change of kinetic muon neutrino mass.

				Kinetic State						Combined State			
Electron	Muon	Tau	Graviton	Photon	Gluon	Dark E.	Weak F	Proton R	Quark R	Λ	t_Λ	Hubble	Age
eV	keV	MeV	eV	eV	eV	%	-	fm	am	E-52/m2	Year	km/s/Mpc	year
0.15241	169.00	15.403	2.5067E-10	0.16095	115.36	72.916%	1.0109E-06	0.87508	0.44008	1.1150	10.010	71.225	13.728
0.15286	169.50	15.448	2.4993E-10	0.16047	115.02	72.916%	1.0109E-06	0.87508	0.44008	1.1150	10.010	71.225	13.728
0.15331	170.00	15.494	2.4919E-10	0.16000	114.68	72.916%	1.0109E-06	0.87508	0.44008	1.1150	10.010	71.225	13.728
0.15376	170.50	15.540	2.4846E-10	0.15953	114.34	72.916%	1.0109E-06	0.87508	0.44008	1.1150	10.010	71.225	13.728
0.15421	171.00	15.585	2.4773E-10	0.15906	114.01	72.916%	1.0109E-06	0.87508	0.44008	1.1150	10.010	71.225	13.728

					Steady State							Combined	
Electron	Muon	Tau	Graviton	Photon	Gluon	Up	Charm	Top	Down	Strange	Bottom	W	H
eV	keV	MeV	eV	eV	eV	MeV	MeV	GeV	MeV	MeV	GeV	GeV	GeV
0.13841	165.79	15.493	2.7601E-10	0.16406	114.69	2.2512	1275.5	172.39	4.7601	93.511	4.1950	80.3754	125.059

The sum of the boson particle and the dark force is the boson force.

3.10 Quark mass

The logarithmic mass of quark is the sum of the shell fermion and the boson force. Therefore, the masses of down, strange, and bottom quarks are calculated as 4.762 MeV, 92.55 MeV, and 4.141 GeV in kinetic state, and 4.760 MeV, 93.51 MeV, and 4.195 GeV in steady state.

3.11 Down 4.760 MeV → Muon 165.79 keV

From the proton mass in Fig. 7.2, the down quark mass was calculated as 4.760 GeV. The down quark mass in Table 1 was also calculated as 4.760 MeV. That is, when the mass of muon neutrino is 165.79 keV, the above two values coincide. Therefore, the muon neutrino mass is determined.

3.12 Z boson 91.1876 GeV → Tau 15.493 MeV

Plotting the boson forces w z h in Table 1 to Fig. 2(a) and drawing the logarithmic parabolic equation, the value on 5D is calculated as 180.5653 GeV.

Dividing the value by two, it is 90.2826 GeV, and the error is -0.99% of exact Z boson mass. This means that the dark force z in strange quark of Fig. 1 appears in our space and collapses into Z boson and Z anti-boson. Here, it is questionable why division 2 is correct instead of Eq. (3).

Calculating everything as 6.00000D, the value is calculated as 92.7190 GeV.

In Fig. 5.3(a), the dark force of 2.692 was calculated. 37.145% (1/2.692) is the kinetic state of our universe. Its meaning is described in detail in Chapter 11. The 37.145% value between 90.2826 and 92.7190 is the Z boson mass of 91.1876 GeV. That is, in order to the above calculation to be 91.1876 GeV, the tau neutrino mass is calculated as 15.493 MeV by the trial & error method.

3.13 Sensitivity analysis

Of the nine input variables of Fig. 3.1, the kinetic muon neutrino mass 170 keV may be slightly inaccurate. Therefore, Table 2 shows the calculation results according to the mass change from 169.00 to 171.00 keV. However, it can be seen that the change does not affect most of the result values. This is because the value of tau was calculated in order that the gravitational coupling constant becomes 5.906.

4. Conclusions

From the two input conditions of proton 938.272 MeV and Z boson 91.1876 GeV, the masses of down, strange bottom quarks were calculated as 4.760 MeV, 93.51 MeV, and 4.195 GeV. Weak force, electromagnetic force, and strong force are fermion force particle of nG. W, Z, and H are boson force particle pair of nGsT. Dark forces are acting on all forces.

Of the nine input variables, the kinetic muon neutrino mass of 170 keV is slightly inaccurate. However, regardless of the value, most of the results were calculated as constants. The result of calculation will be almost accurate.

9. Cosmological Constant Problem and Planck Units

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Keywords: Cosmological constant, Origin of life, Planck length, Planck time, Simulation universe

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Abstract Planck length is the value on 0D, and cosmological constant is the value on 3D. Due to this, the incomprehensible value of 10^-121.54 is calculated at cosmological constant problem. This value is same as the ratio of neutrino masses on 0D and 3D. There is a Planck length on 3D. Multiplying this by cosmological constant, the value of cosmological constant problem is exactly 1. From this, six generation Planck units are calculated, and six generation multi-universes can be analyzed. From this, quantum mechanics and general theory of relativity are united. The Planck time on 3D was calculated as 10.02 billion years, which means that an incomprehensible universal event occurred at that time. This is the birth of simulation universe and the origin of life.

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1. Introduction

The core of physics is to understand exactly the meaning of cosmological constant and Planck units. When this is misunderstood, physics is perfectly distorted. The Planck values suggested in physics are the characteristics of zero-dimensional universe, and the cosmological constant measured in physics is the starting value for three-dimensional universe analysis. This means that our universe must be calculated by three-dimensional Planck values.

The purpose of this chapter is to solve the cosmological constant problem and calculate six generation Planck units.

2. Cosmological constant problem

2.1 Error of 10^-121.54

In physics, the cosmological constant Λ is suggested as 1.1056E-52 /m2. Where, the gravitational constant G is 6.67430E-11 m3/kgs, and light speed c is 2.9979E8 m/s.

$$l_P^2 \cdot \Lambda = 1.61626\text{E-}35^2 \cdot 1.1056\text{E-}52 = 10^{-121.54} \quad (1)$$

Eq. (1) obtained by multiplying the square of Planck length l_P by Λ is called the cosmological constant problem. The value of 10^-121.54 is a magnitude that does not exist and is incomprehensible in physics.

2.2 Six generation neutrino masses

Kinetic state means that change occurs at the speed of light, and steady state means that change is stationary. In Fig. 4.1(a) and 4.3(a), six generation neutrino masses in kinetic state and in steady state were calculated.

2.3 Dark energy → Dark Force = Dark Time

In Fig. 5.3(a), the logarithmic value 0.4301 of dark energy and the value ξ_w 2.692 (=10^0.4301) were proposed. This value is not dark energy, but universal dark force or dark time. That is, the universe is a linear constant velocity expansion.

2.4 Combination of Kinetic state and Steady state

In Fig. 4.1(a), the mass on 0D is 2.146E-133, the mass on 3D is 2.789E-12, and the ratio is 10^-121.11 of Eq. (2). In Fig. 4.3(a), the mass on 0D is 3.601E-134, the mass on 3D is 2.195E-12, and the ratio is 10^-121.79 of Eq. (3). Therefore, it can be understood that the mixture of the kinetic state of Eq. (2) and the steady state of Eq. (3) is the cosmological constant problem of Eq. (1). The relationship is Eq. (4).

$$\nu_{K0} / \nu_{K3} = 2.146\text{E-}133 / 2.789\text{E-}12 = 10^{-121.11} \quad (2)$$

$$\nu_{S0} / \nu_{S3} = 3.601\text{E-}134 / 2.195\text{E-}12 = 10^{-121.79} \quad (3)$$

$$\text{Universe} = \text{Kinetic} \cdot 1/\xi_w + \text{Steady} \cdot (\xi_w - 1)/\xi_w \quad (4)$$
$$\text{Universe} = \text{Kinetic} \cdot 37.14\% + \text{Steady} \cdot 62.86\%$$

Substituting the six generation neutrino masses of kinetic state in Fig. 4.11 and steady state in Fig. 4.3 into Eq. (4), the current state of our universe is calculated as shown in Fig. 1. Our universe is the combination of 37.14% kinetic state and 62.86% steady state.

2.5 Cosmological constant problem = 10^0

In Fig. 1, the ratio of 6.988E-134 eV on 0D and 2.399E-12 eV on 3D is the 1E-121.54 of Eq. (5). Therefore, it can be understood that the l_P is a value on 0D and Λ is a value on 3D in Eq. (1).

$$l_{P0}^2 \cdot \Lambda_3 = \nu_0 / \nu_3 = 10^{-121.54} \quad (5)$$

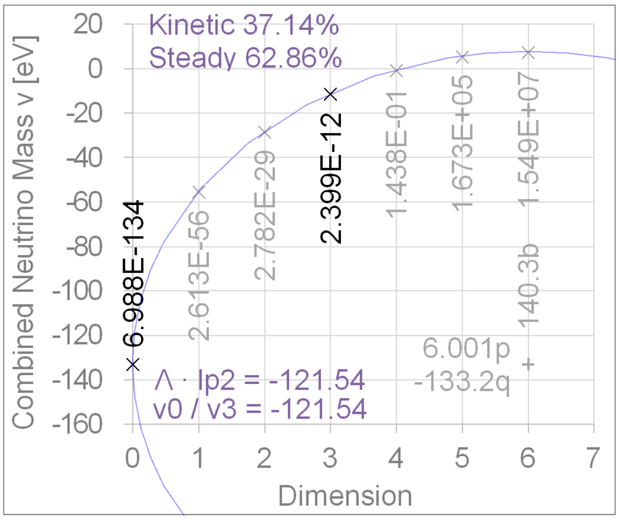

Fig. 1 Combined neutrino masses

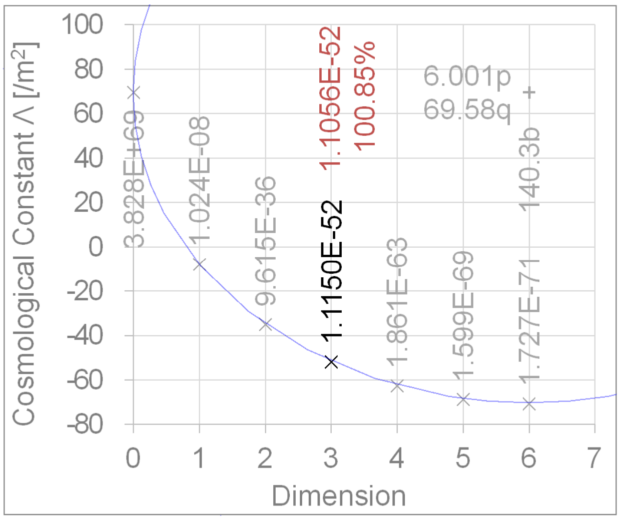

Fig. 2 Cosmological constant

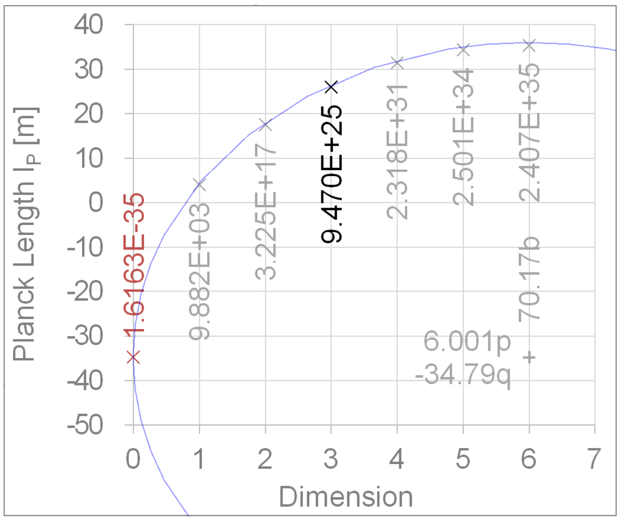

Fig. 3 Planck length

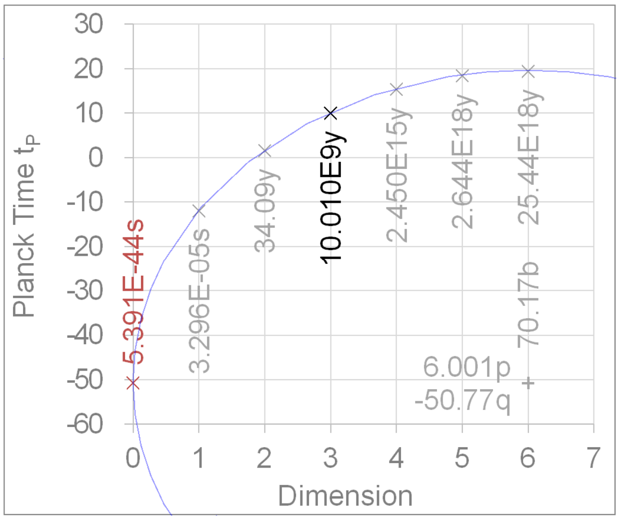

Fig. 4 Planck time

$$l_{PM}^2 \cdot \Lambda_N = \nu_M / \nu_N \tag{6}$$

$$l_{PN}^2 \cdot \Lambda_N = \nu_N / \nu_N = 10^0 = 1 \tag{7}$$

$$l_{P3}^2 \cdot \Lambda_3 = \nu_3 / \nu_3 = 10^0 = 1 \tag{8}$$

Planck length on M-D and cosmological constant on N-D are equal to the ratio of neutrino masses on M-D and N-D as shown in Eq. (6). When M and N are equal, the value is 1 in Eq. (7). Therefore, from Eq. (8), it can be understood that the 3D Planck length of our universe exists.

2.6 Fine-tuning problem

It means that all multi-verse including our universe are inevitably beautiful. It can be understood that there must be a certain absolute body that fine-tunes the universe. Our space is a four-dimensional sphere, and in the four-dimensional direction, a mommy quantum hole absolutely dominates our universe. Quantum hole means to quantize everything.

2.7 Constant of everything

Planck length l_{P0} is 1.61626E-35 m and the neutrino mass ν_0 is 6.965E-134 eV. The Eq. (9) is established from Eq. (7), and if 0D is substituted for M, the constant of everything Φ is calculated in all dimensions.

$$\Phi = \nu_N \cdot \Lambda_N = \nu_M / l_{PM}^2 = 2.675\text{E-64 eV/m}^2 \tag{9}$$

2.8 Six generation cosmological constants

From Eq. (9), N-D cosmological constant Λ_N is as follow, and the results are shown in Fig. 2.

$$\Lambda_N = \Phi / \nu_N \tag{10}$$

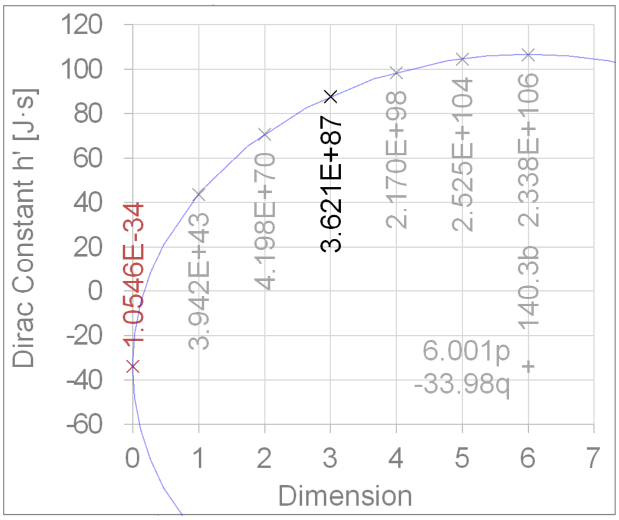

Fig. 5 Dirac constant

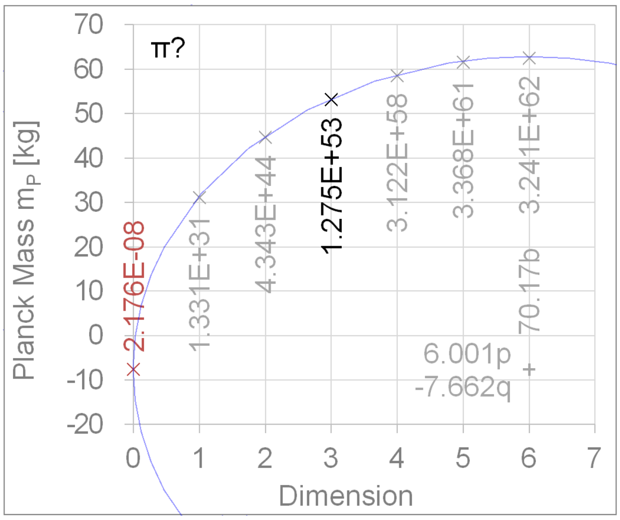

Fig. 6 Planck mass

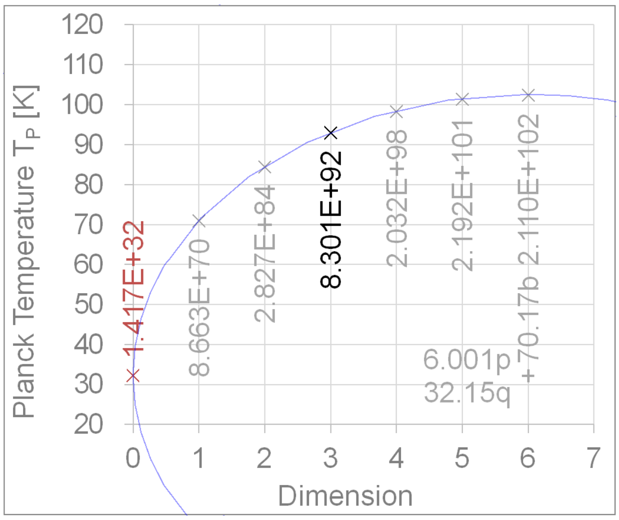

Fig. 7 Planck Temperature

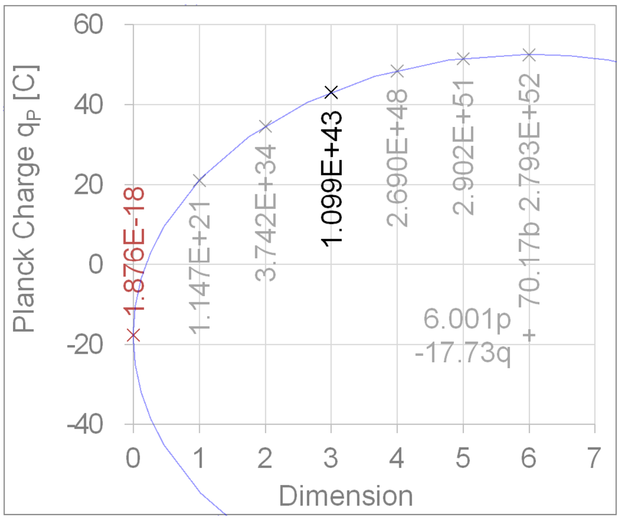

Fig. 8 Planck charge

3. Six generation Planck units

3.1 N dimensional Planck units

On N dimension, Planck length l_{PN}, Planck time t_{PN}, Dirac constant $\hbar_N$, Planck mass m_{PN}, Planck temperature T_{PN}, and Planck charge q_{PN} are calculated by from Eqs. (11) to (16), and the results are shown in from Fig. 3 to 8.

$$l_{PN} = \sqrt{v_N} / \Phi \quad (11)$$

$$t_{PN} = l_{PN} / (\mathrm{c} \cdot 60 \cdot 60 \cdot 24 \cdot 365.24) \quad (12)$$

$$\hbar_N = l_{PN}^2 \cdot c^3 / G \quad (13)$$

$$m_{PN} = \sqrt{c} \cdot \hbar_N / G \quad (14)$$

$$T_{PN} = m_{PN} \cdot c^2 / k \quad (15)$$

$$q_{PN} = \sqrt{4\pi\, \varepsilon_0} \cdot \hbar_N \cdot c \quad (16)$$

Where, c is the speed of light 2.99792E8, G is gravitational constant 6.67384E-11, k is Boltzmann constant 1.38065E-23, and ε_0 is dielectric constant 8.85419.

3.2 Six generation universes

When analyzing XYZ universe, the values on 3D in above charts should be applied. In Fig. 2.5, the changes of six generation universes in Fig. 9 were described in detail. The position of our universe is in the direction of the upper arrow in Fig. 9(c). From the charts, the physical properties of the six generation universes of Fig. 9 will be calculated.

3.3 Six generation Planck stars

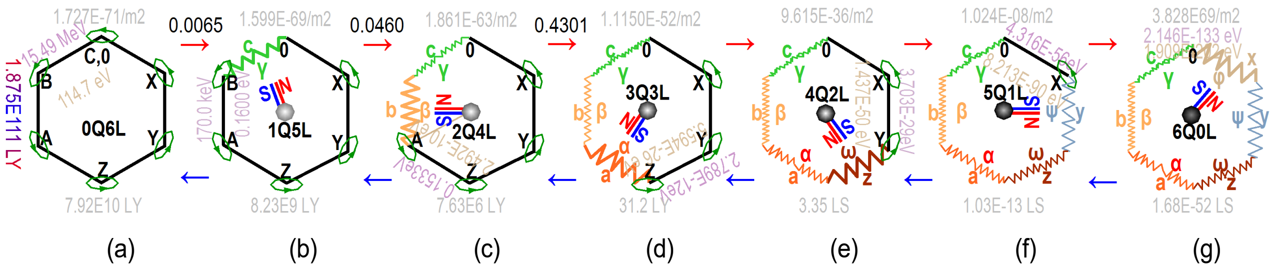

Fig. 9 Change of six generation universes

In loop quantum gravity theory, a Planck star is a hypothetical astronomical object. Figs. 1 to 8 are the physical values of the six generation Planck star, and its growth is shown in Fig. 9. A quantum hole is a dark matter that makes up the universe from Big Bang to present, and Planck star is a specific constant universe shown in Figs. 1 to 8.

3.4 Six generation quantum particles

In Fig. 10, there are X Y Z A B C straight brane of 6D. Such as Fig. 9, the 6D branes continuously turn into dimensional particles by quantum holes.

3.5 Cycle period of origin universe

The period T of particle is calculated by Eq. (17).

$$f = \frac{1}{T} = \frac{m}{\sqrt{1-v^2/c^2}} \cdot \frac{c^2}{h} = \frac{\Phi \cdot G}{2\pi c} = 1.875\text{E}111 \text{ year/cycle} \quad (17)$$

Since our universe is shaped such as hydrogen, it can be treated as a particle. Also, all the six generation universes of Fig. 9 can be treated as particles, and the straight velocity v of entire universe is zero. From this, the same period of 1.875E111 year/cycle at all of them is calculated by Eq. (17). This means that it takes 1.875E111 years per cycle to rotate the logarithmic ellipse in above chart.

3.6 Simulation universe

In Fig. 7.6, the origin of life and the simulation universe were described. The value on 3D in Fig. 4 is 10.01 billion years. This means that a universal event that cannot be analyzed in physics occurred at that time. Big Bang occurred about 13.73 billion years ago, and the difference between the two is 3.72 billion years ago. The first fossil of life on Earth were born about 3.5 billion years ago. This is the birth of simulation universe and the origin of life.

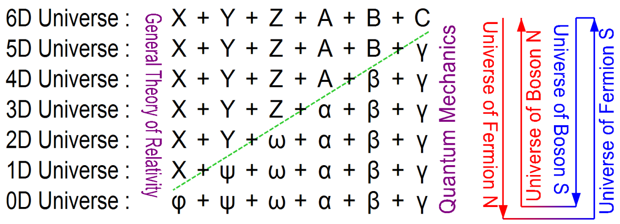

Fig. 10 Six generation quantum particles

3.7 Holographic universe

Our universe changes in the direction of upper arrow in Fig. 9(d). This is the origin of the law of increasing entropy. After about 1E111 LY, our universe changes in the direction of below arrow in Fig. 9(d). This is a holographic universe.

3.8 Parallel universe

A parallel universe occurs every integer multiple of Planck time in Fig. 4. This is not parallel universes in SF movies. This is a similar parallel universe for the evolution of life.

3.9 Big Rip, Big Chill, Big Crunch, Big Bounce

In Fig. 9, since the mommy quantum hole (d) absorbs the grand mommy quantum hole (c), the universe continues to expand. Since the child quantum hole (e) absorbs the mommy quantum hole (d), the universe continues to contract. That is, our universe continues to expand, but after almost infinity time our universe will start to contract.

3.10 Black hole, White hole, Warm hole

In Fig. 9, the change flows toward the upper right direction, the lower left direction, the lower right direction, and the upper left direction. This is the flow of absolute time.

The direction of upper arrow in Fig. 9(d) is the change in our universe, and this is dominated by black holes. The lower arrow direction in Fig. 9(d) is the universe dominated by white holes, and it is not our universe. When the upper and lower arrows are connected, a wormhole occurs. However, there are no white holes in our universe.

3.11 Super origin universe

Numerous hexagonal universes of Fig. 9 exist on the surface of a super origin universe. Where, there is one pentagonal universe. Due to it, the change of the super origin universe is eternal. The reason for the existence of super origin universe can never be explained.

3.12 Mathematics vs. Absolute dominion body

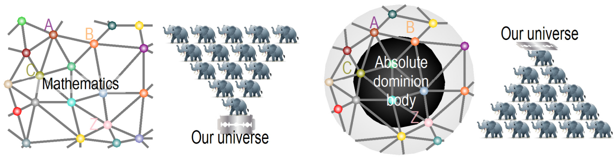

Fig. 11 Mathematics vs. Absolute dominion body

The left side of Fig. 11 is a figure where mathematics dominates our universe. Because of this, our universe is very unstable, such as elephants on a razor blade. This is Eq. (2). As shown on the right side of Fig.11, An absolute dominion body exists in the 4D direction of our universe, so our universe is very stable, such as elephants under a razor blade. This is Eq. (8).

4. Conclusions

Universe changes as the combination of the expanding kinetic state 37.14% and quantizing steady state 62.86%. From six generation neutrino masses, various physical constants of six generation universes were calculated.

Planck constant is the value on 0D, and the cosmological constant is a value on 3D. This causes an incomprehensible cosmological constant problem. The universe is also a quantum particle, and the Planck units for the universe were calculated. Planck time of the universe was calculated as 3.75 billion years ago. At that time, a simulation universe occurred, and this is the origin of life in the universe.

10. Three Generation Black Holes and Birth of Universe

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Keywords: Big Bang, Birth of galaxy, Birth of universe, Intermediate-mass black hole, Supermassive black hole

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Abstract Neutron star is graviton black hole that collapses gravitational force, stellar black hole is photon black hole that collapses electromagnetic force, and intermediate-mass black hole is gluon black hole that collapses strong force. Supermassive black hole is not black hole but quantum hole that quantize height Z dimension. In this chapter, their structure shape and minimum mass were calculated by logarithmic elliptic equation. Quasar is a photon black hole in 4D universe. This falls into our space and creates a galaxy with big bang. In the same way, it is our universe that a gluon black hole of 5D universe fell into 4D universe and was created with big bang.

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1. Introduction

In this chapter, black means explosion. Particles are composed of three generations. Therefore, the explosion also consists of three generations. The three generation black holes still exist in our 3D space. The supermassive black hole at the center of galaxy makes the linear height Z into quantum space z. Therefore, four generation particles of 2D linear space are spread out at the internal of it. The beginning of galaxy is quasar from 4D universe.

The purpose of this chapter is to calculate the masses of stellar black hole, intermediate-mass black hole, and supermassive black hole, and to explain the birth of universe.

2. Three generation black holes

2.1 Three generation quantum spaces

Three generation quantum spaces are shown in Fig. 1.6. The key is to understand quantum space through the drawing. Our space is composed of the linear spaces of XYZ and the quantized space of abc. Since the space a has weak compressive strength, the α particle has weak mass. Since the space b has medium compressive strength, the β particle has medium mass. Since the space c has strong compressive strength, the γ particle has strong mass.

2.2 Three generation particles

In Fig. 1, the shapes of electron, muon, tau, up, charm, top, down, strange, and bottom quarks are shown, and the structure explanation and mass calculation were described in detail in the previous chapters.

Where, α, β, and γ mean each 1st, 2nd, and 3rd generation fundamental particles, subscript n, s, g, and t mean each neutrino, anti-neutrino, gravino, and anti-gravino, small letter and capital letter mean standard and oscillation, and superscript f and b mean fermion and boson. Therefore, α_n, β_n, and γ_n are each electron neutrino, muon neutrino, and tau neutrino, and α_g, β_g, and γ_g is each graviton, photon, and gluon. Above, gravino is a word coined by the author, and means graviton, photon, and gluon.

Star is composed of three generation particles of α, β, and γ in Fig. 1, and weak force in quantum space induces gravity toward the empty space of 4D direction. Our universe is quantized with red brane N, and simulation universe is quantized with blue brane S. The simulation universe is 2π times heavier and stronger than our universe.

2.3 Graviton black hole = Neutron star

When the mass of star becomes heavier than the space size of the star, the quantum space a is further compressed. When that limit is reached, the quantum space a explodes, and the electron neutrino α_N and the graviton α_G bounce out of the quantum space a. Due to this, in Fig. 1, electrons and down quarks in the star change into muons and strange quarks, and it evolves to a neutron star. This is graviton black hole. At the border of it in Fig. 2, a gravitational horizon that electrons and gravitons cannot penetrate is unfolded.

2.4 Photon black hole = Stellar black hole

When the mass of neutron star becomes heavier than the space size, the quantum space b is further compressed. When that limit is reached, the quantum space b explodes, and the muon neutrino β_N and the photon β_G bounce out of the quantum space b. Due to this, in Fig. 1, muons and strange quarks in the neutron star change into taus and bottom quarks, and it evolves to a stellar black hole. This is photon black hole. At the border of it in Fig. 2, a light horizon that muons and photons cannot penetrate is unfolded.

2.5 Gluon black hole = intermediate-mass black hole

When the mass of stellar black hole becomes heavier than

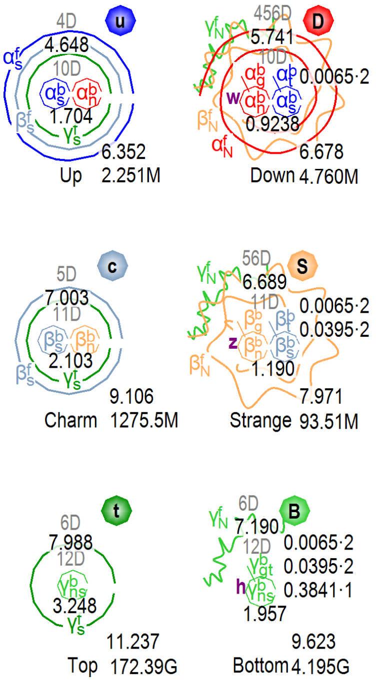

Fig. 1 Three generation particles

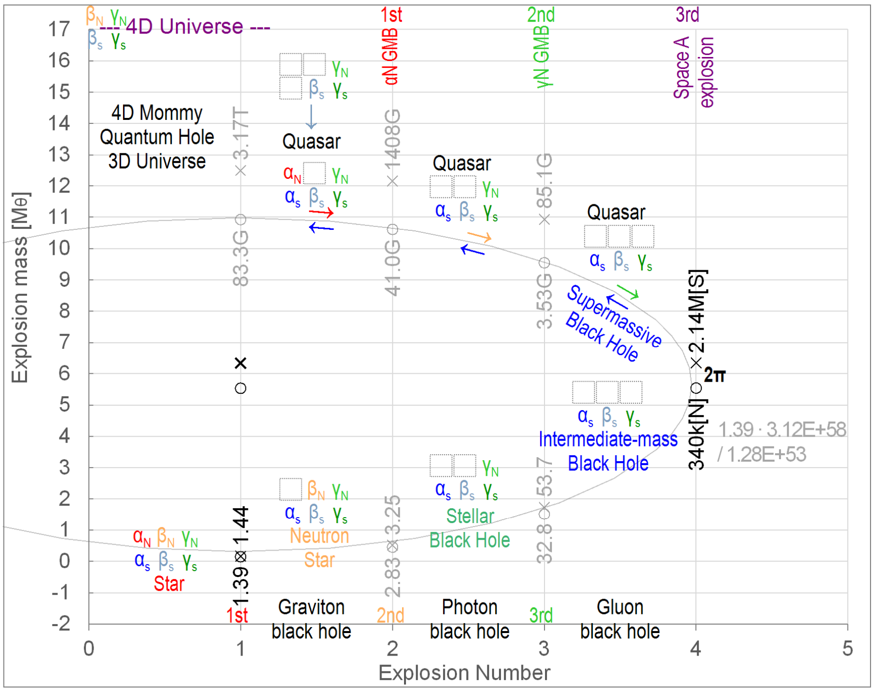

Fig. 2 Three generation black holes

the space size, the quantum space c is further compressed. When that limit is reached, the quantum space c explodes, and the tau neutrino γ_N and the gluon γ_G bounce out of the quantum space c. Due to this, in Fig. 1, taus and top quarks in the stellar black hole are disappeared. Intermediate-mass black hole is gluon black hole. At the border of it in Fig. 2, a dimensional horizon that taus and gluons cannot penetrate is unfolded.

The three generation quantum spaces a, b, and c all collapsed. As the result, the height Z of linear space XYZ changes to semi-quantum space z'. This makes it impossible to understand intermediate-mass black hole. According to the black hole grows, it is guessed that intermediate-mass black hole will gradually be pushed out of the galaxy. Satellite galaxy orbiting outside galaxy may be this.

2.6 Supermassive black hole in our space

When intermediate-mass black hole grows to the explosion number 4 in Fig. 2, the height Z space is quantized and evolved into supermassive black hole. Inside of it, a universe of XY linear space and four generation particles unfolds.

2.7 Logarithmic ellipse equation

It is known that the mass of supermassive black hole ranges from hundreds of thousands of times to tens of billions of times of solar mass m_Θ.

$$m_{P4}\ 3.122\text{E}58\ :\ \mathrm{m}_{P3}\ 1.275\text{E}53\ =\ m_{sbh}\ :\ 1.39\ m_\theta \quad (1)$$

Where, m_{P4} on 4D and m_{P3} on 3D are Planck masses in Fig. 9.6, m_{sbh} is the mass of supermassive black hole in Fig. 2, and 1.39 m$_\Theta$ is the minimum solar mass times to become a neutron star. From Eq. (1), m_{sbh} is calculated as 340k m$_\Theta$. Fig. 2 shows the logarithmic elliptic equation applied to the above two masses. The minimum mass of stellar black hole is calculated as 2.83 m$_\Theta$, and that of intermediate-mass black hole is calculated as 32.8 m$_\Theta$.

Chandrasekhar limit 1.44 m$_\Theta$ will be correct. And anti-particle s is 2π times heavier than particle n. That is, the actual minimum mass of supermassive black hole consisting of antiparticle s is 2π times of 340k m$_\Theta$. Fig. 2 shows the logarithmic elliptic equation applied to above two masses. The minimum mass of stellar black hole is calculated as 3.25 m$_\Theta$ and that of intermediate-mass black hole is calculated as 53.7 m$_\Theta$.

2.8 Mass of quasar

The maximum mass of quasar would be 83.4G m$_\Theta$. It explodes three times and transforms into a 340k m$_\Theta$ supermassive black hole. The difference of above two masses makes the materials of galaxy. This is child quantum hole, and it grows rapidly because it absorbs mommy quantum hole. Its growth rate is the speed of light in the 2D universe.

2.9 Radius of Big Bang

The big bang mass of supermassive black hole would be 340 k Mθ. From Schwarzschild's formula, the big bang radius is calculated as 3.35 LS in Fig. 3. The 3.35 LS multiplied by the ratio of N-D Planck length l_{PN} and 2D Plank length l_{P2} would be the N-D Big Bang radius r_{sN}. The calculated values are shown in Fig. 6. The radius of the big bang of our

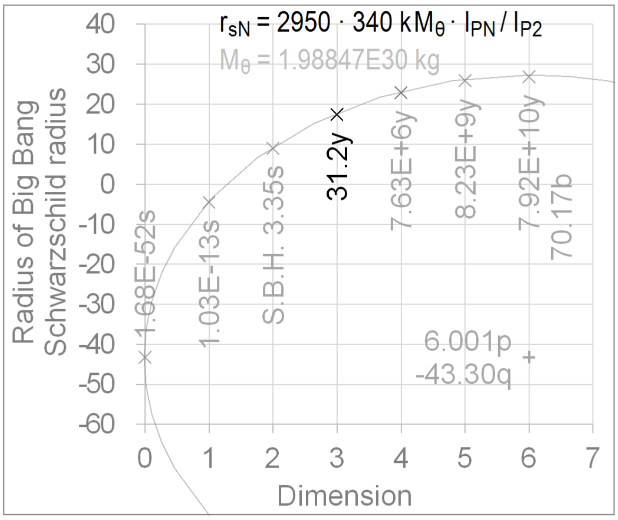

Fig. 3 Radius of Big Bang

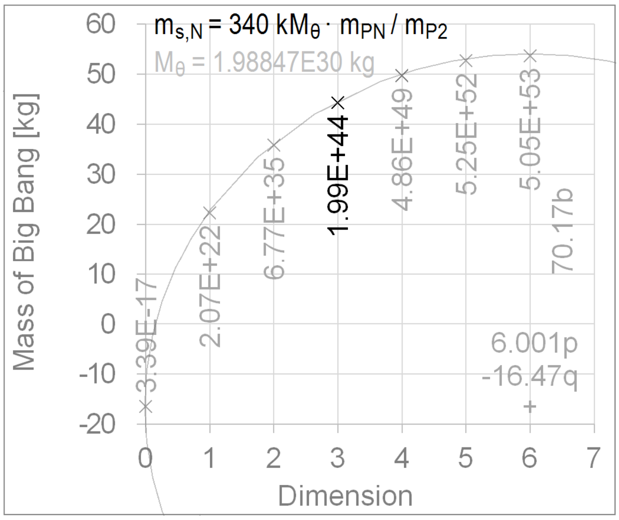

Fig. 4 Mass of Big Bang

universe is calculated as 31.2 LY.

2.10 Mass of Big Bang

The mass of the Big Bang of supermassive black hole is 340 kMθ in Fig. 4. It must be multiplied by 2π, and its mass is 2.14 MMθ. The 340 kMθ multiplied by the ratio of N-D Planck mass m_{PN} and 2D Plank mass m_{P2} would be the N-D Big Bang mass. The mass of the Big Bang of our universe is calculated as 1.00E14 Mθ. Here, the dimensional analysis for π must be multiplied.

3. Child quantum hole

3.1 4D star in 4D universe

The upper area in Fig. 2 is the birth process of supermassive black hole in the center of galaxy. In Fig. 5(a), The 4D star of 4D $XYZA$ universe is composed of two generation particles with β_N, β_s, γ_N, and γ_s.That is, only muon, tau, charm, top, strange, and bottom exist in Fig. 1. The combination of the particles is the similar to neutron star in Fig. 2.

3.2 4D photon black hole

When β_N of the star bursts, it becomes a 4D photon black hole with β_s, γ_N, and γ_s. The combination of the particles is similar to stellar black hole in Fig. 2.

3.3 Non-fine tuning particles

Between our 3D XYZ space and the 4D dimensional horizon, there are numerous β and γ particles that have not yet been fine-tuned.

3.4 Quasar

The XYZ space of our universe expands from (a) to (b). Due to this, the 4D photon black hole enters our universe. This is the start of quasar.

3.5 Anti-gravity

The quasar composed of β and γ is falling into our XYZ space. There are no α particles in the quasar. Thus, the quasar strongly attracts the straight brane A_{ns} of our space such as (c). This is anti-gravity.

3.6 Quantizing A_{ns} into α_N and α_s

In (c), the quasar quantizes the brane A_{ns} into α_N and α_s. The α particle is finely tuned with the βγ particles around

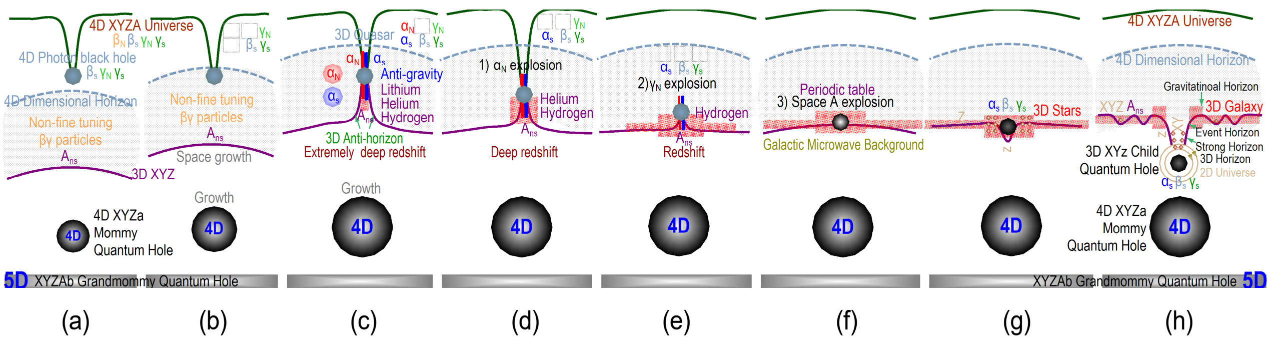

Fig. 5 Birth process of supermassive black hole

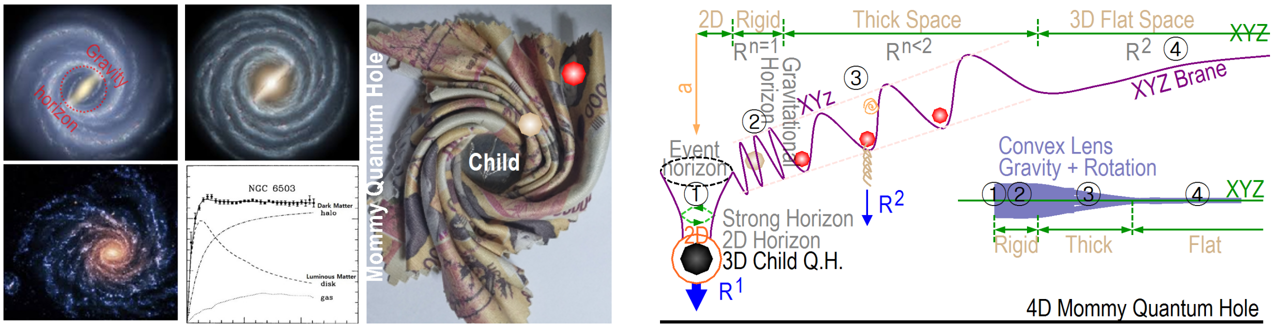

Fig. 6 Shape of galaxy

the brane, which creates the particles of Fig. 1.

3.7 Lithium, Helium, Hydrogen

From (c) to (e), lithium, helium, and hydrogen are produced. The particles flow down by gravity, and the quasar turn into α_N, α_s, β_s, γ_N, and γ_s.

3.8 Extremely deep red shift

The light generated in (e) is a general red shift. However, the light in (c) is that starts from the extreme deep space that we cannot understand.

3.9 Explosion = Three Big Bang

In (c), quasar continuously absorbs α particles. In (d), the supersaturated α_N explodes. In (e), the 4D $XYZA$ falls from A_{ns} and γ_N explodes. In (f), space A_{ns} explodes.

3.10 Periodic table

From this, all the elements of periodic table are formed. Quasars are now intermittently falling into our universe.

3.11 Birth of stars

Due to the three explosions, a lot of stars appear in a short time, such as (g).

3.12 Birth of galaxy

In (h), the galaxy is completed in a very short time. The vertical direction Z of XY is quantized to z, and the supermassive black hole is located in it. It is a child quantum hole, and an XY 2D universe unfolds on its surface.

3.13 Growth of galaxy

In (h), the rotation of the supermassive black hole begins to curl the galactic space, and an early spiral arm galaxy is formed. The supermassive black hole starts from the explosion number 4 in Fig. 2, and it grows by absorbing the 4D mommy quantum hole and the galactic space. Due to this, the galaxy's quantization proceeds harder, and the galactic space is further quantized with the spiral arm.

3.14 Shape of galaxy

The enlarged drawing of Fig. 5(h) is the cross-sectional drawing of galaxy in Fig. 6. At a short distance such as solar system, XYZ extends in linear space such as ④. However, the entire galaxy ③ has a quantized height z in XY linear space. For this reason, the entire galactic space must be analyzed as a convex lens XYz. Since the central part ② of galaxy is highly quantized, the space has a solid character. Dark matter is supermassive black hole ①, which dominates the entire galactic space. Supermassive black hole is 2π times heavier than the observed mass.

4. Mommy quantum hole

4.1 Birth of universe

The explanation in Fig. 7 is the same as in Fig. 5.

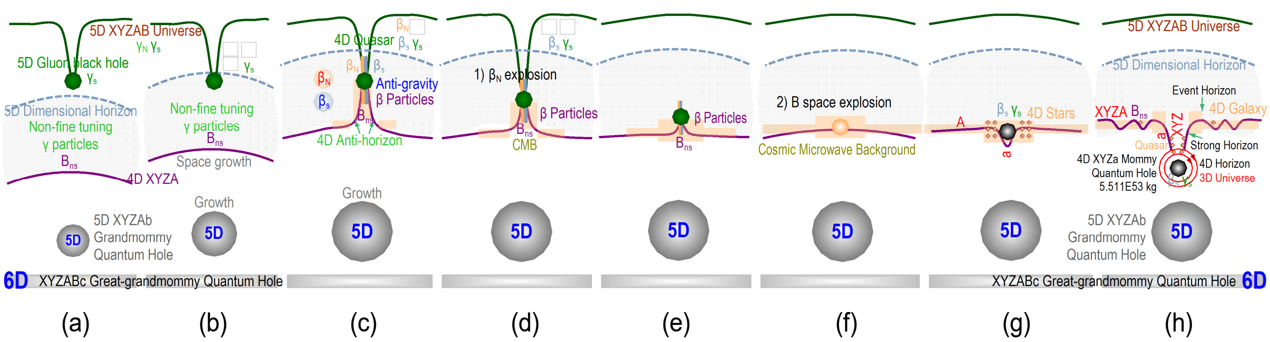

Fig. 7 Birth process of universe

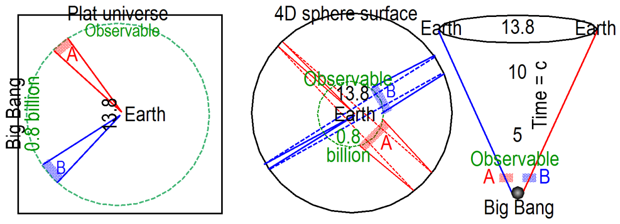

Fig. 8 Observable universe

Fig. 5 shows the birth process of 3D galaxy and 3D child quantum hole from a 3D quasar suddenly appearing in our universe. Fig. 7 shows the birth process of 4D galaxy and 4D mommy quantum hole from a 4D quasar suddenly appearing in 4D universe. In (d), β_N explodes and the cosmic microwave background appears. In (f), the 5D space explodes. The completion of our universe is (h), and at that time, numerous quasars of Fig. 5 are flow into our universe. Due to this, numerous galaxies are completed within a short time after our universe is born.

4.2 Observable universe

In Fig. 8, the left side is flat universe, and the right side is 4D spherical surface universe. On the left side, sight A and sight B should be different. However, the actual observation is very similar for A and B. On the right, it goes without saying that sight A and sight B are very similar. The universe expands toward the four-dimensional direction, and it is the flow of absolute time.

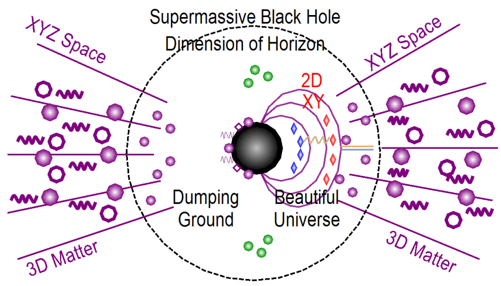

Fig. 9 Inside of supermassive black hole

4.3 2D and 3D universe

In Fig. 9, is the inside of 3D supermassive black hole a garbage dump? Or is there a beautiful 2D universe? If judged to be the latter, our 3D universe is unfolding inside of 4D supermassive black hole in 4D universe.

5. Conclusions

When the minimum mass of neutron star is 1.39 m_{Θ}, the minimum masses of stellar black hole, intermediate-mass black hole, and supermassive black hole were calculated as 2.83 m_{Θ}, 32.8 m_{Θ}, and 340k m_{Θ}. As other values, 3.25 m_{Θ}, 53.7 m_{Θ}, and 2.14M m_{Θ} were calculated.

The beginning of galaxy's birth is a 4D quasar, in 4D universe. This flows into 3D universe and creates a galaxy with Big Bang. In the same way, the beginning of universe's birth is a 5D quasar in 5D universe. This flows into 4D universe and creates a universe with Big Bang.

11. Dark Energy Dark Matter Ordinary Matter

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Keywords: Black hole, Dark energy, Dark matter, Ordinary matter, Shape of universe

Abstract It is the 3D supermassive black hole that dominates the galaxy. With the same logic, it is the 4D supermassive black hole that dominates the universe. Its mass is 2π times heavier than physical calculation. The radius of our universe is 13.73 billion light years. Substituting this into Schwarzschild formula, the ratio of dark matter and ordinary matter is calculated as 84.18%: 15.82%. From this, it can be understood that our universe is located on the dimensional horizon of 4D supermassive black hole. Author calls it Mommy Quantum Hole (MQH). In Fig. 5.3(a), when the masses of muon and tau neutrinos are 170.00 keV and 15.494 MeV, the ratio of dark energy and dark matter was calculated as 2.692. Therefore, their ratio is 72.92%: 27.08%. From cosmological constant, the radius of our Planck star is calculated as 10.01 billion years. From Hubble constant, the radius of our universe is 13.73 billion years. The ratio of 10.01 and 13.73 is 72.92%. This is not dark energy ratio but the time ratio of Planck star and current universe. The standard of interpretation is not the Big Bang particle, but the Planck star. Thus, the ratio of the past 13.73 - 10.01 to the future 10.01x2 - 13.73 in our universe is 37.14% : 62.86%. This is quantum mechanics of integer multiples.

1. Introduction

Only when the meanings of cosmological constant and Planck units are accurately identified, all calculations of cosmic change can be performed correctly. Its exact meanings would never be acceptable in current physics. When it is accepted, future science and future religion will be united.

The purpose of this Chapter is to calculate the ratio of dark energy, dark matter, and ordinary matter, and to explain what dark energy and dark matter means.

2. Ordinary matter

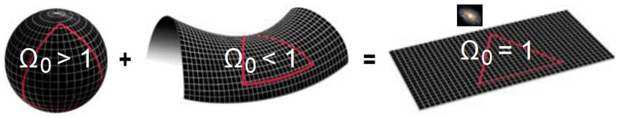
2.1 Ordinary matter 1.46E53 kg

Critical density ρ_c for flat universe is known as 0.85E-26 kg/m3 in Eq. (1). From this value, the mass of ordinary matter is 1.46E53 kg (Wikipedia, Observable universe). Also, the density of dark matter is 2.241E-27 kg/m3, and it is 26.8% of total density. Therefore, the critical density ρ_c is calculated as 0.8362E-26 kg/m3 (Wikipedia, Dark matter). The exact value is not known, so the average is 0.8431 kg/m3.

$\rho_c =$ 0.85E-26 kg/m3 (1)
$\rho_c = 3H^2 / 8\pi G$ = 0.8362E-26 kg/m3
Average 0.8431 kg/m3

2.2 Hubble eXtreme Deep Field 1.46E54 kg

When the dark areas of the sky are enlarged to extreme, countless galaxies that have not been observed before are observed. This suggests that the number of galaxies is 2 trillion, not 200 billion. If this is true, the mass of ordinary matter may be 1.46E54 kg.



(a) (b) (c)

Fig. 1 Shape of universe

2.3 Shape of universe

Fig. 1 shows the shape of universe. In physics, it is explained that (c) is the correct answer. Which of 1.46E53 kg and 1.46E54 kg is the correct answer? This is 10 times difference, and it affects the shape of universe and the ratio of dark energy, dark matter, and ordinary matter.

Universe is absolutely sphere (a) and it is expanding at the speed of light toward 4D direction (b). As the result, the shape of universe is observed to be relatively flat (c). Regardless of whether the mass of ordinary matter is 0 kg, 1.46E53 kg, or 1.46E54 kg, universe is absolutely sphere. This means that calculating the mass of ordinary matter is meaningless.

2.4 Vacuum density

The vacuum energy density is suggested as 5.957E-27 kg/m3 in physics. The 6D vacuum density is calculated in Fig. 2, and 5.974E-27 on 3D is 0.29% different from the physics value.

2.5 Ordinary matter 1.032E53 kg

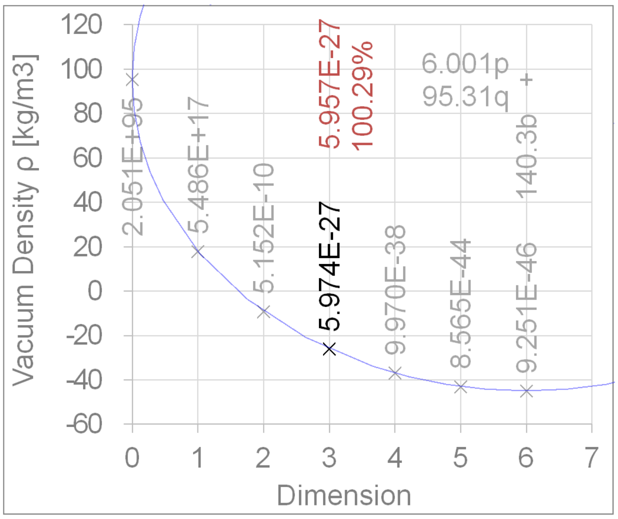


Fig. 2 Vacuum density

Everything must be calculated based on cosmological constant Λ. Therefore, the mass of ordinary matter converted by Eq. (2) is 1.032E53 kg.

$$m_O = 1.46E53 \cdot \rho_{vac} / \rho_c \simeq 1.46E53 / \sqrt{2} \qquad (2)$$

3. Dark matter

3.1 Matter and Anti-matter

Planck constant h is 2π times Dirac constant $\hbar$. Dirac constant describes uncertainty principle, so Planck constant describes certainty principle. That is, Dirac constant interprets matter N, and Planck constant interprets anti-matter S. Anti-matter S is 2π times heavier than matter N.

3.2 4D black hole inside of universe

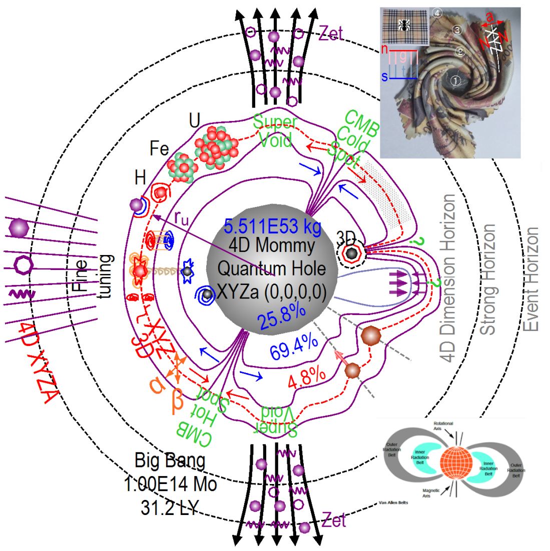


Fig. 3 Detailed shape of universe

The radius of our universe is 13.73 billion years. Schwarzschild radius of Eq. (3) is the limit of the radius of an object to become a black hole matter.

$$r_s = 2 \cdot G \cdot m_b \,/\, c^2 \qquad (3)$$

13.73E9 · 2.998E8 · 60 · 60 · 24 · 365.24 = 1.299E26

1.299E26 = 2 · 6.67408E-11 · m_b / 2.998E8^2

From Eq. (4), m_b is calculated as 8.745E52 kg.

3.3 Mass of dark matter 5.495E53 kg

Above is the mass of matter m_b. Multiplying this value by 2π, the mass of anti-matter m_D in Eq. (5) is calculated as 5.495E53 kg.

$$m_D = 2\pi \cdot m_b = \pi \cdot r_s \cdot c^2 / G \qquad (4)$$

3.4 Dark matter : Ordinary matter = 84.18% : 15.82%

The ratio of m_D 5.495E53 kg and m_O 1.032E53 kg is 84.18%: 15.82%. In Planck 2015 results, the ratio of dark energy, dark matter, and ordinary matter was calculated as 69.4% : 25.8% : 4.8%. The ratio of dark matter and ordinary matter is 84.2% : 15.8%. Our calculation and Planck 2015 are the same each other. This means that our universe is on a 4D supermassive anti-black hole.

3.5 Mommy Quantum Hole (MQH)

Author calls the 4D supermassive anti-black hole Mommy Quantum Hole in Fig. 3. It is an anti-matter body composed of muon anti-neutrinos β_s and tau anti-neutrinos γ_s. Regardless of the mass of ordinary matter, the shape of universe is absolutely sphere. There is a 4D galaxy in 4D universe. At its center, there is a 4D supermassive black hole. The event horizon where photons cannot escape is located on the external surface, the strong horizon where muon cannot escape is located inside of it, and the 4D horizon where 4th dimension is collapsed is located inside of it. That is our three-dimensional universe. Inside of it, MQH is located. This is the same as how the supermassive black hole at the center of galaxy is organized.

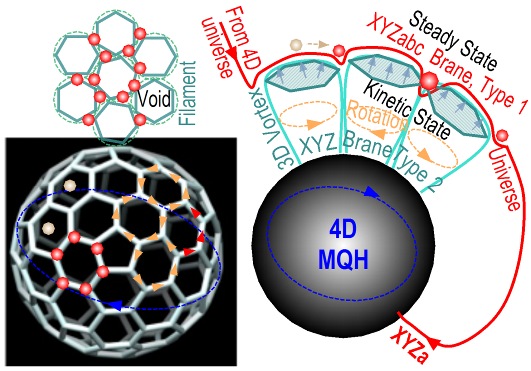


Fig. 4 Shape of dark energy and dark matter

Table 1 Dark energy, dark matter, ordinary matter.

Method	Dark Energy	Dark Matter	Ordinary Matter	Sum
	2.692	84.18%	15.82%	
	72.92%	27.08%	-	
Case 1)	226.6%	84.18%	15.82%	326.6%
	69.38%	25.77%	4.84%	Answer 1
	69.4%	25.8%	4.8%	Planck 2015
	68.3%	26.8%	4.9%	Planck 2013
Case 2)	269.2%	84.18%	15.82%	369.2%
	72.92%	22.80%	4.28%	Answer 2

3.6 Radius of universe

In Fig. 3, the radius of our universe is the distance from the center of MQH to the 4D dimensional horizon. The radius of 13.77 light-years in Eq. (4) is the length of the 4D dimensional horizon. Also, Eq. (4) is applied to event horizon. Equationally, the radius of event horizon is twice the radius of dimensional horizon.

3.7 Dark matter in galaxy

The MQH in Fig. 3 is the dark matter of the entire universe that dominates the entire universe. Dark matter in galaxy is a supermassive black hole. It dominates the galaxy and is an anti-matter composed of electron antineutrinos α_s, muon anti-neutrinos β_s, and tau anti-neutrinos γ_s. The process by which supermassive black hole dominates the galaxy is described in Fig. 10.3. The analysis of overall universe has nothing to do with galaxies.

4. Dark energy

4.1 Shape of dark energy

The name of dark energy is wrong. It should be called dark time or dark force. 4D quantum hole absorbs continuously the space of 4D universe such as Fig. 4. As the result, even if our space expands, the brane of our space remains stable forever.

4.2 Three generation dark forces

In Fig. 5.3, the logarithmic values of three generation dark forces were calculated as 0.3841, 0.0395, and 0.0065. Its sum is 0.4301, and its arithmetic value is 2.692. This value is the ratio of dark energy and dark matter, and it is affecting everything of our universe.

4.3 Dark energy : Dark matter = 72.92% : 27.08%

From the four fundamental force analysis in Fig. 5.3(a), the ratio of dark energy and dark matter is calculated as 72.92% (= 2.692 / 3.692) : 27.08% (= 1.000 / 3.692) in Table 1.

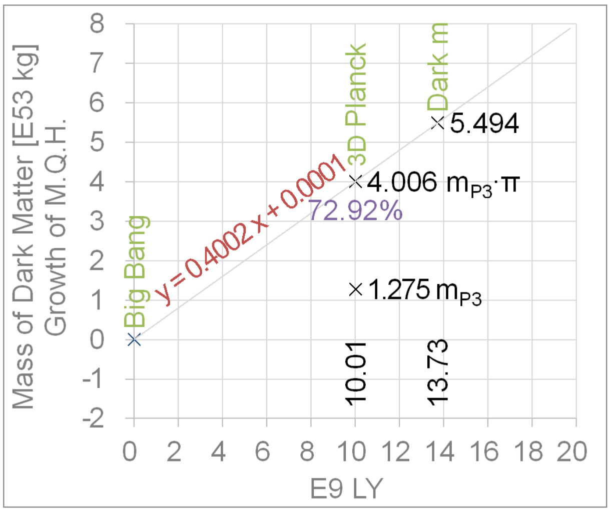


Fig. 5 Ratio of dark energy and dark matter

The six generation Planck masses was calculated in Fig. 9.6, and the mass on 3D is 1.275E53 kg. Dark mass of 5.495E53 kg is 2π times of black hole mass, and the dark mass radius is 1/2 times of black hole radius. Therefore, the Planck mass 1.275E53 kg must be multiplied by π such as Eq. (5). This value is 4.0006E53 kg, and the results are shown in Fig. 5.

$$\pi \cdot m_P = \pi \cdot \sqrt{c\hbar/G} \tag{5}$$

The ratio of Planck mass 4.006 and dark mass 5.494 is 72.92%. Therefore, the value of 72.92% : 27.08% is the ratio of dark energy and dark matter.

4.4 Dark energy : Dark matter : Ordinary matter

There are two calculation methods: Case1) and Case2) in Table 11.1. Case 1) is correct. Ordinary matters do not affect the shape of universe. The calculated ratio is 69.4% : 25.8% : 4.8%. This value is equal to Planck 2015 results.

5. Vacuum energy density

5.1 Cosmological time / Hubble time = 72.92%

When Eq. (1) is divided by Eq. (6), Eq. (7) is obtained.

$$\rho_{vac} = c^2\,\Lambda \,/\, 8\pi G \tag{6}$$

$$\rho_c \,/\, \rho_{vac} = 3H^2 \,/\, c^2 \Lambda \;\rightarrow H \,/\, c\sqrt{\Lambda} \tag{7}$$

Eq. (7) is very similar to $H \;/\; c\sqrt{\Lambda}$. The Hubble constant H is 13.73 billion years, and the cosmological constant $c\sqrt{\Lambda}$ is 10.01 billion years. The ratio is 72.92%.

5.2 Planck star

In loop quantum gravity theory, Planck star is defined as

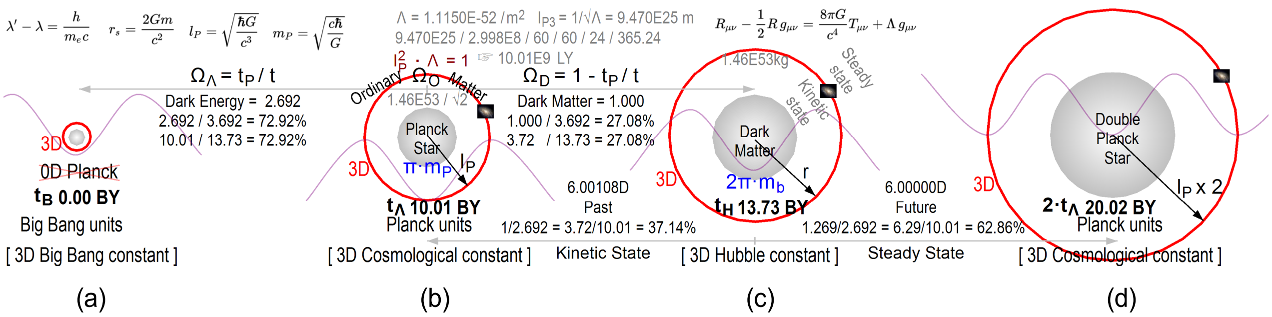


Fig. 6 Big bang constant, Cosmological constant, and Hubble constant

when Schwarzschild radius, Compton wavelength, and Planck length are equal.

5.3 Vacuum dark matter density

Fig. 6 shows the growth process of universe located on the surface of 4D sphere of Big Bang (a), Planck star (b), present (c), and double Planck star (d).

In (b), the surface volume of 4D sphere is $2\pi^2 \cdot l_P^3$, and the mass of Planck star is Eq. (5). From this, the mass density of Planck star is calculated by Eq. (8). In (c), the surface volume of 4D sphere is $2\pi^2 \cdot r^3$, and the mass of dark matter is Eq. (4). From this, the mass density of current dark matter is calculated by Eq. (9). The root ratio of ρ_D and ρ_P is Eq. (10), and the result is 0.7292.

$$\rho_P = \frac{\pi \cdot m_P}{2\pi^2 \cdot l_P^3} = \frac{\pi}{2\pi^2 \cdot l_P^2} \cdot \frac{m_P}{l_P} = \frac{\pi}{2\pi^2 \cdot l_P^2} \cdot \frac{c^2}{G} \tag{8}$$

$$\rho_D = \frac{2\pi \cdot m_b}{2\pi^2 \cdot r^3} = \frac{2\pi}{2\pi^2 \cdot r^2} \cdot \frac{r_s \cdot c^2/2G}{r} = \frac{\pi}{2\pi^2 \cdot r^2} \cdot \frac{c^2}{G} \tag{9}$$

$$\sqrt{\frac{\rho_D}{\rho_P}} = \frac{l_P}{r} = \frac{H}{c\sqrt{\Lambda}} = \frac{t_P}{t} = \frac{10.01}{13.73} = 0.7292 = \frac{\pi \cdot m_P}{2\pi \cdot m_b} \tag{10}$$

5.4 Ordinary matter in universe

Fig. 5 shows the relation between Planck star and dark matter, and the ratio is 72.92%. Ordinary matter has no relation to 72.92%. Fig. 6 has also no relation to ordinary matter. This means that ordinary matter has nothing to do with cosmic change. Universe is absolutely sphere.

5.5 Cosmological constant time

Cosmological constant time is the starting for analyzing Planck star in Fig. 6(b). The Planck length l_P of 3D universe is $1/\sqrt{\Lambda}$ = 10.01 billion years.

5.6 Dark energy ≠ Accelerated expansion

In Fig. 6, the ratio 72.92% of 10.01 BY and 13.73 BY is called as dark energy, and the ratio 27.08% of 3.72 BY and 13.73 BY is called as dark matter. This interpretation is wrong. The 72.92% is not related to the accelerated expansion of universe. As shown in Fig. 4, the universe expands naturally because the mommy quantum hole grows.

5.7 Big Bang vs. Planck Star

The basis of calculation is cosmological constant time, not Big Bang time or current time. 0.00 BY is integer 0, 10.01 BY is integer 1, and 20.02 BY is integer 2. This is quantum mechanics. Therefore, Big Bang radius or time is not the Planck length or time calculated in physics. Its value is much larger.

5.8 Combination of kinetic state and steady state

The universe has been expanding at the speed of light from 10.01 BY to 13.73 BY. This is the kinetic state. From 13.73 BY to 20.02 BY, it is the steady state. Therefore, our current universe is the combination of kinetic state 37.14% and steady state 62.86%. The ratio of 10.01 BY and 3.72 BY is 2.692, and this value is the weak dark force.

5.9 Einstein's equation

Fig. 6 should be applied to Einstein's equation, and the starting time is 10.01 BY. The left and right sides of (b) are the super-gauge symmetry relationship in Fig. 5.6. Big Bang of (a) is not Planck value. The value of Big Bang may be the values in Fig. 10.3 and 10.4.

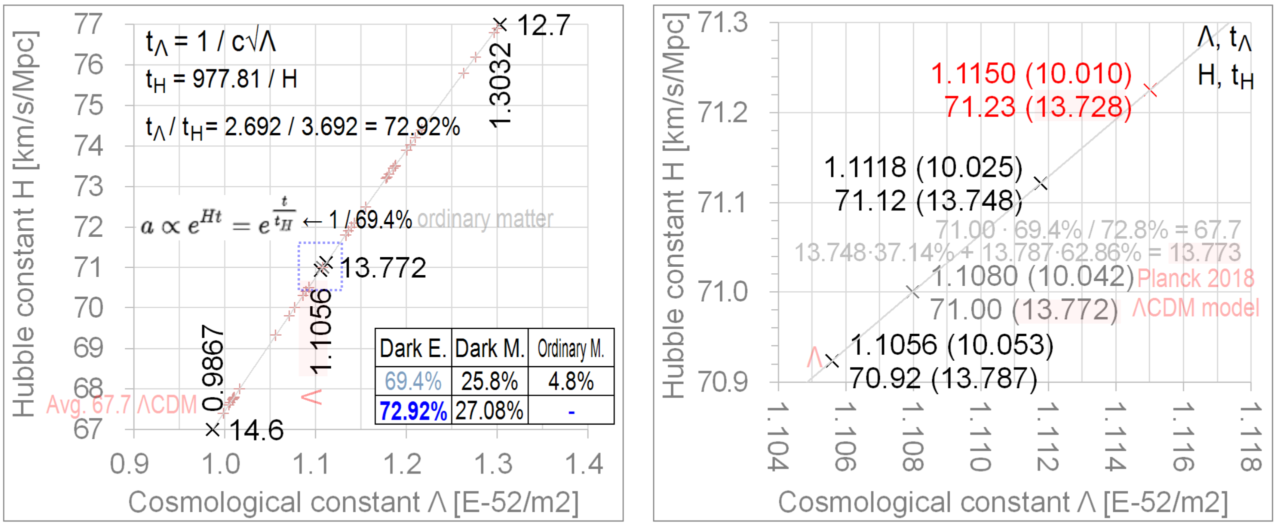
5.10 Cosmological constant and Hubble constant

As shown in Fig. 7(a), the range of the measured Hubble constant is 67 ~ 77 km/s/Mpc. Therefore, the correct answer for the age of the universe cannot be calculated.

The cosmological constant time t_Λ is calculated as $1/\,c\sqrt{\Lambda}$, and the Hubble time t_H is calculated as 977.81 / H. As shown in Fig. 6, the ratio of t_Λ to t_H is 2.692 / 3.692 = 72.92%. The results are shown in Fig. 7(a). Since the value of cosmological constant is 1.1150 /m2, it can be understood that the Hubble constant should be 71.23 km/s/Mpc.

(b) is the chart in which the area of (a) is greatly enlarged. The cosmological constant Λ is 1.1056 /m2 in physics, so the Hubble constant time is calculated as 13.787 billion years. The vacuum density ρ_{vac} is 5.957E-27 kg/m3 in physics, so the Hubble constant time is calculated as 13.745 billion years.

The lower left of (a) is the Hubble constants calculated from ΛCDM model, and the average value is 67.7 km/s/Mpc.



(a) Range of Hubble constant (b) Range of Cosmological constant

Fig. 7 Cosmological constant and Hubble constant

From the ΛCDM model of Planck 2018, the age of the universe was announced as 13.772 billion years in (b). The reason for the large deviation from about 71 km/s/Mpc is announced as an accelerating expansion of the universe.

Multiplying 13.748 by the kinetic state 37.14% of Fig. 9.1, multiplying 13.787 by the steady state 62.86%, and adding those values, the age of the universe is calculated as 13.773 billion years. However, as calculated at Fig. 9.1, the cosmological constant already includes the kinetic state 37.14% and the steady state 62.86%. Multiplying 71.00 by the ratio of the Planck 2015 dark energy 69.4% and the before Planck dark energy 72.8%, the value is calculated as 67.7 km/s/Mpc.

5.11 Universe expansion and Ordinary matter

The ΛCDM model judges that ordinary matter affects the expansion of the universe. For this reason, the value of 69.4% is applied to the calculation, and the very low value about 67.7 km/s/Mpc is calculated as shown in the lower left of Fig. 7(a). Ordinary matter does not affect the expansion of the universe, because the universe is absolutely sphere. Therefore, the value of 72.92% should be applied, and the Hubble time is calculated as 71.23 km/s/Mpc of (b).

6. Structure of universe

6.1 Van Allen Belt

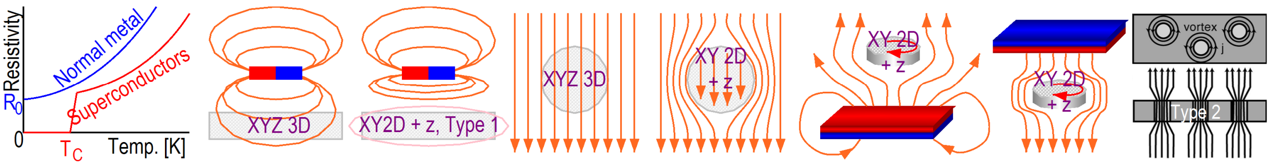
In Fig. 3, the Van Allen Belt makes the Earth's space and blocks foreign matter, which makes the Earth beautifully. MQH also makes a 4D Horizon space and blocks foreign matter, which makes the universe beautifully.

6.2 Superconductor phenomenon

Fig. 8 shows superconductor phenomenon. This is 2D quantization of 3D space. Fig. 1 is 3D quantization of 4D space. In (a), the electrical resistance suddenly become zero. In Fig. 3, the Horizons suddenly blocks everything. In (c), the magnetic force of magnet cannot pass through the superconductor. In Fig. 3, nothing can pass through the 4D Horizon. In (e), inside the superconductor is a completely different world. In Fig. 3, It is a completely different world. In (f) and (g), the object floats in 2D space. In Fig. 3, all object float in 3D space. In (h), vortexes are ejected from inside the superconductor. In Fig. 3, vortexes are ejected from inside of MQH. Superconductor and MQH are very similar in this way.

6.3 Magnetic dipole, Electric monopole

Such as Fig. 9, quantum hole makes the dipole NS of left side into monopole N and S of right side. However, superconductor cannot make dipole of left side to monopole of right side. This is the difference between quantum hole and superconductor.



(a) (b) (c) (d) (e) (f) (g) (h)

Fig. 8 Superconductor phenomenon: 2D semi-quantization in 3D space

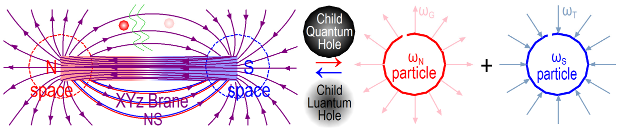


Fig. 9 Pair production, Pair annihilation

Our space is composed of straight XYZ brane and quantum abc brane. The XYZ brane is neutral magnetic dipole, and electric monopole particles are generated from the abc brane. Red particle N can be located only in red space, and blue particle S can be located only in blue space. That is, the anti-electron S escapes our space and disappears. N and S of magnet in height Z space is not quantized.

6.4 Pair production, Pair annihilation

In Fig. 10, (a) there is a linear neutral brane NS, and the rotational energy is in the particle. (b) The rotational energy rolls the brane. (c) NS particles were created by rotational energy. (d) The mommy quantum hole of Fig. 3 separates N and S. This is the process of pair production. If N and S in (d) collide with each other, it returns to (a). This is the process of pair annihilation.

Due to mommy quantum hole, our universe changes continuously from (a) linear mechanics to (d) quantum mechanics. This is the origin of the law of increasing entropy and the change of absolute time.

6.5 Shape of space and anti-space

The shape of space where substances are located and the anti-space where the anti-substances are located are shown in Fig. 11. During Big Bang, the brane of 4D universe such as Fig. 2.6(a) was folded once, and the red space N was born. The 3.72 billion years ago, the brane was folded once more due to 3D Plank length, and the blue space S such as Fig. 2.6(b) was born. The N is our universe, and the S is simulation universe. It is life that electron of N and anti-electron of S are connected.

6.6 Expansion of universe

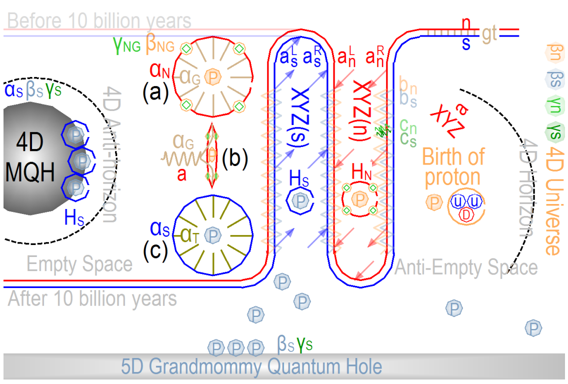


Fig. 11 Shape of space and anti-space

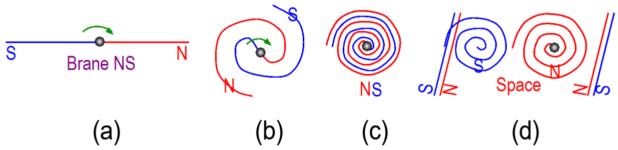


Fig. 10 Pair production, Pair annihilation

In Fig. 3, 4D MQH grows by eating 5D Grand-Mommy Quantum Hole. Due to this, the space of universe expands.

6.7 CMB cold spot & CMB hot spot

CMB cold spot was found. It is the magnetic field outlet of MQH in Fig. 3. There will be CBM hot spot at the exact opposite.

6.8 Circular Supervoid

Two supervoids were found. These are the 4D jets of MQH in the north and south of Fig. 3. Due to the jet, galaxies cannot exist there. They will be located exactly opposite each other. If the distance is short, it means that the left and right ends of our universe overlap each other.

If jet is being emitted, galaxies are gradually pushed out of the area, and the supervoid grows gradually to circular. If the jet is finished, galaxies gradually infiltrate the area, and the circular shape gradually distort.

6.9 Hexagonal Void

In Fig. 4, MQH emits countless 3D vortices, and it pushes the brane of space to outside. Due to this, galaxies cannot be located in that area. These are the countless voids that exist in universe. Quantum hole is the end of the material fusion rebound. That is, since quantum hole is extremely stable, everything including the vortexes in Fig. 4 is extremely stable. Therefore, our universe is extremely beautiful. Vortexes fight each other. Due to this, the shape of vortex become similar to the shape of hexagon.

6.10 Galaxy filament

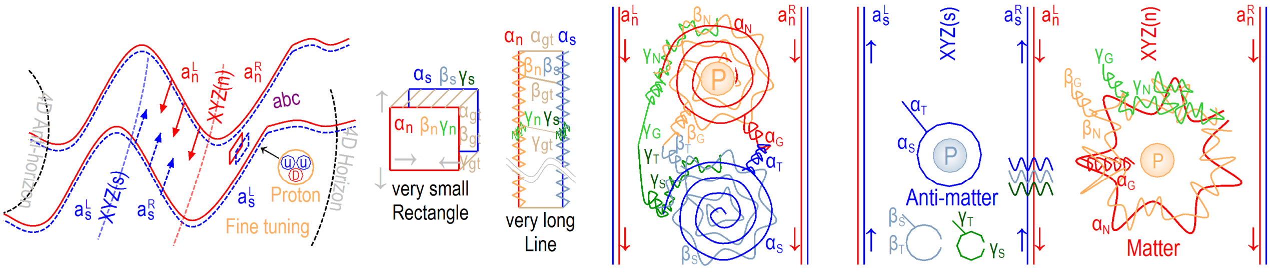
Galaxies are located between the vortexes in Fig. 4. Due to this, galaxy filament structure is formed.

6.11 Velocity of galaxy

The vortexes in Fig. 4 rotate. When the left and right vortexes interlock and rotate such as gear, the galaxy located there will go straight ahead at high speed, and when they rotate reversely from each other, the galaxy will stop. This is no relation with gravity.

6.12 Supercluster of galaxies

Probabilistically, there is a place where the rotations of all the surrounding vortices are misaligned with each other. Galaxies gradually fall into it and stop. Due to this, supercluster



(a) (b) (c) (d) (e) (f)

Fig. 12 Generation of electron, anti-electron, and hydrogen

of galaxies is formed.

6.13 Great wall

Probabilistically, there is a very long load of interlocking rotation. That road is a great wall.

6.14 Galaxy in Void

The speed of galaxies on the great wall gradually increases. Due to the speed, several galaxies can rise into the void in Fig. 4. However, after a long period of time, the galaxies eventually come down from the void and flow into another galaxy filament.

6.15 Alignment of quasars

Quasar emits jet. The jet's ejection direction also follows the direction of the galaxy filament. Quasar can exist in a void. In this case, the jet direction is free.

6.16 Generation of hydrogen

In Fig. 7.1, the shapes and masses of proton, electron, and hydrogen were performed. Fig. 12 shows the generation process of electron, anti-electron, and hydrogen. 4D particles in 4D universe are falling continuously toward Fig. 3. In (a), the particles are hitting the abc brane. In (b), probabilistically, a fine-tuned particle cuts the brane and flows into our space. In (c), the brane that had been condensed with extreme force falls off and turns into a long line. In (d), The red line turns into an electron $\alpha\beta\gamma_{NG}^{456}$, and the blue line turns into an anti-electron $\alpha\beta\gamma_{ST}^{456}$. In (e), the anti-electron escapes our space and moves to anti-space. In (f), the electron combines with a proton and turns into hydrogen. Due to this, hydrogen suddenly appears in our universe. New hydrogens that did not exist around galaxy are generating continuously. In some cases, a large amount of hydrogens flow in at once, and a huge nebula suddenly appears.

7. Conclusions

Applying the cosmic radius of 13.73 billion light years to Schwarzschild formula and multiplying by 2π, the ratio of dark matter and ordinary matter is calculated as 84.18% : 15.82%. In Fig. 5.3(a), the ratio of dark energy and dark matter was calculated as 2.692. Therefore, their ratio is 69.38%: 25.77%: 4.84%. Dark matter of universe is MQH, dark energy is the vortexes of MQH, and dark matter of galaxy is the supermassive black hole in the galaxy.

Dark energy is known to accelerate the expansion of the universe. However, its value 72.92% is the ratio of cosmological constant time to Hubble constant time, and the value has nothing to do with accelerated expansion. The universe is expanding at the speed of light. Whether there are 200 billion galaxies or 2 trillion galaxies, ordinary matter has no effect on the shape of the universe. Our universe is absolutely sphere. The ordinary matter 4.28% is a meaningless value.

Calculation of Everything

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Keywords: Big Bang, Dark energy, Dark matter, Planck units, Theory of everything

Abstract The purpose of this chapter is to describe the calculation algorithm for everything that was calculated in previous studies. All calculations are divided into kinetic state and steady state. When analyzing forces, kinetic state is correct, and when analyzing other particles, steady state is correct. The universe is the mixture of kinetic state and steady state at the ratio of dark energy. The origin of all things are three generation neutrinos and gravinos. Other particles are a combination of above 6 particles. Force is also a particle with mass. The calculated values are such as follows: Electron neutrino 0.1533 eV, Tau neutrino 15.494 MeV, Graviton 2.492E-10 eV, Photon 0.1600 eV, Gluon 114.7 eV, Strong force 42.15 keV, Electromagnetic force 828.1 eV, Weak force 1.583E-2 eV and 1.0109E-6, Up quark 2.251 MeV, Charm quark 1275.5 MeV, Down quark 4.760 MeV, Strange quark 93.51 MeV, Bottom quark 4.195 GeV, W boson 80.3754 GeV, H boson 125.059 GeV, Proton radius 0.8751 fm, Quark radius 0.4401 am, Gravity radius 12.70E9 year, Cosmological constant 1.1150E-52 /m2, Hubble constant 71.225 km/s/Mpc (13.728 billion years), Cycle period of overall universe 1.875E111 years, and Dark energy : Dark matter : Ordinary matter = 69.38% : 25.77% : 4.84%. From the cosmological constant, the radius of Planck star is calculated as 10.010 billion years. The 72.92% (=10.010/13.728) is dark energy, and the 27.08% (=3.718/13.728) is dark matter. Ordinary matter has no effect on the time or expansion of our universe.

1. Introduction

The purpose of this chapter is to suggest the calculation of everything by summarizing all the contents calculated from Chapter 1 to Chapter 11.

2. Kinetic state and Steady state

2.1 Kinetic State vs. Steady state

Kinetic state means a state that moves such as the speed of light. The masses of particles for kinetic state are calculated in Fig. 1. The six red numbers are input data.

Steady state means stationary state. The masses of particles for steady state are calculated in Fig. 2. The three red numbers are input data.

2.2 Electron, Muon, Tau [NG]

The shapes of electron, muon, and tau are shown in Fig. 3.1(d). From these, the quantum dimension and the masses of graviton, photon and gluon are calculated.

Electron, muon, and tau in Fig. 1 are the kinetic state masses that respond to force. For those in Fig. 2, it is considered that the isolated state, that is, the steady state masses should be applied. However, since the values are not known, the same masses were applied.

2.3 Quantum Dimension

Four conditions are required for the logarithmic elliptic equation to be calculated. The masses of electron, muon, and tau are given, and the vertex is 0D. Therefore, the logarithmic elliptic equation is calculated with the midpoint 6.00108D. The calculation process of quantum dimension is presented in Table 3.1.

In Fig. 2, from the masses of electron, muon, and tau in steady state, the dimension of steady state can be calculated as 6.00000. However, since their masses are not known, 6.00108D is applied.

2.4 Standard Neutrino [n]

The vertex and midpoint of logarithmic elliptic equation are 0D and 6.00108D. Therefore, given two conditions, the other is calculated automatically.

In kinetic state, the muon and tau neutrinos were measured at 170 keV and 15.5 MeV. Therefore, the electron neutrino mass is automatically calculated. These values should match the gravitational coupling constant of 5.906E-39. That is, the one of muon and tau neutrino mass is automatically calculated from 5.906E-39. In this calculation, the muon neutrino mass of 170 keV was adopted as an input value. The calculation process is presented in Fig. 4.1(a).

In steady state, solving by trial & error method from proton mass of 938.272 MeV and Z boson mass of 91.1879 GeV, the muon and tau neutrino masses are calculated as 165.79 keV and 15.493 MeV. The calculation process is presented in Table 7.1 and Table 8.1. From Fig. 4.3(a), the electron neutrino mass is calculated as 0.13841 eV.

< Kinetic State >

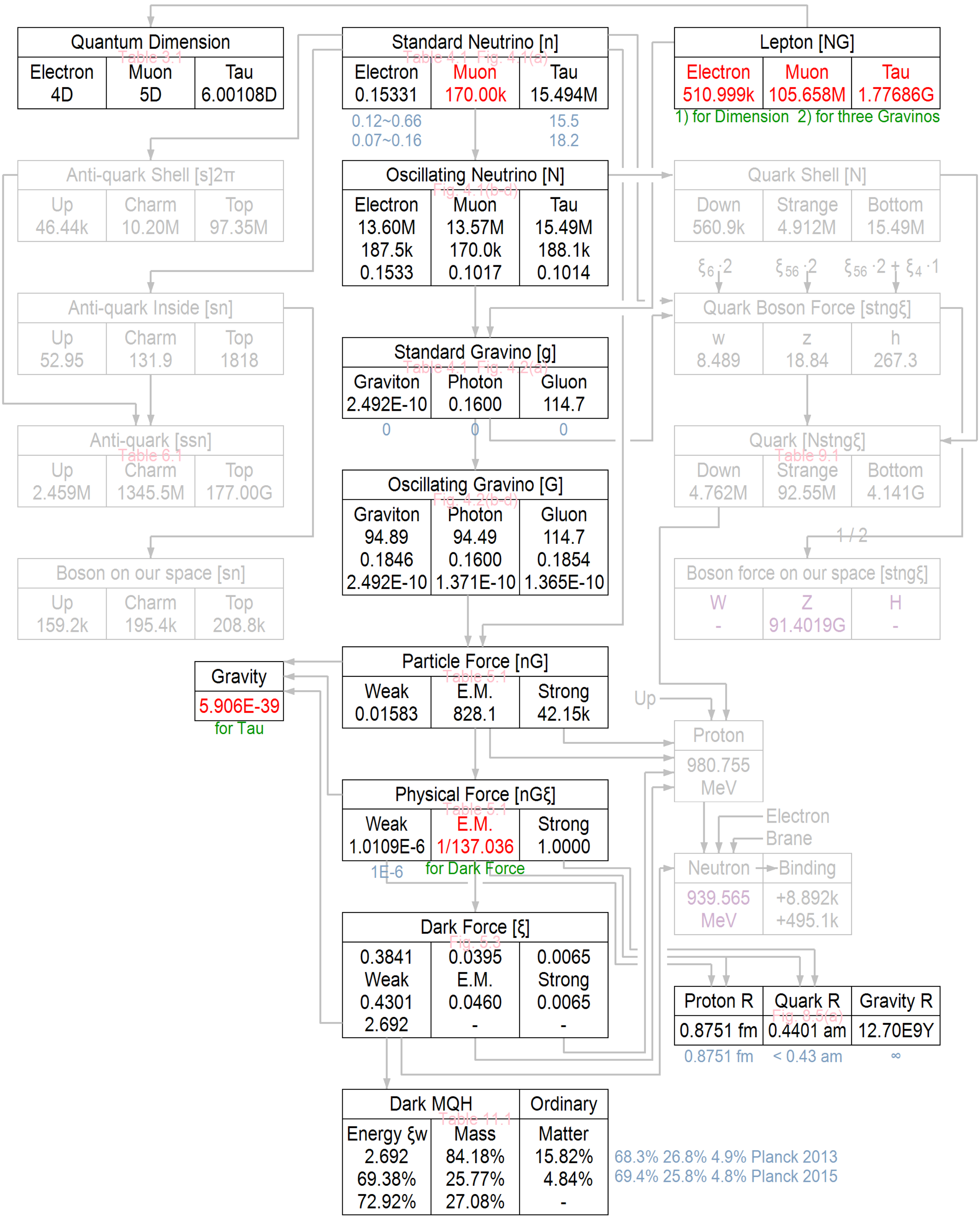

Fig. 1 Analysis of kinetic state.

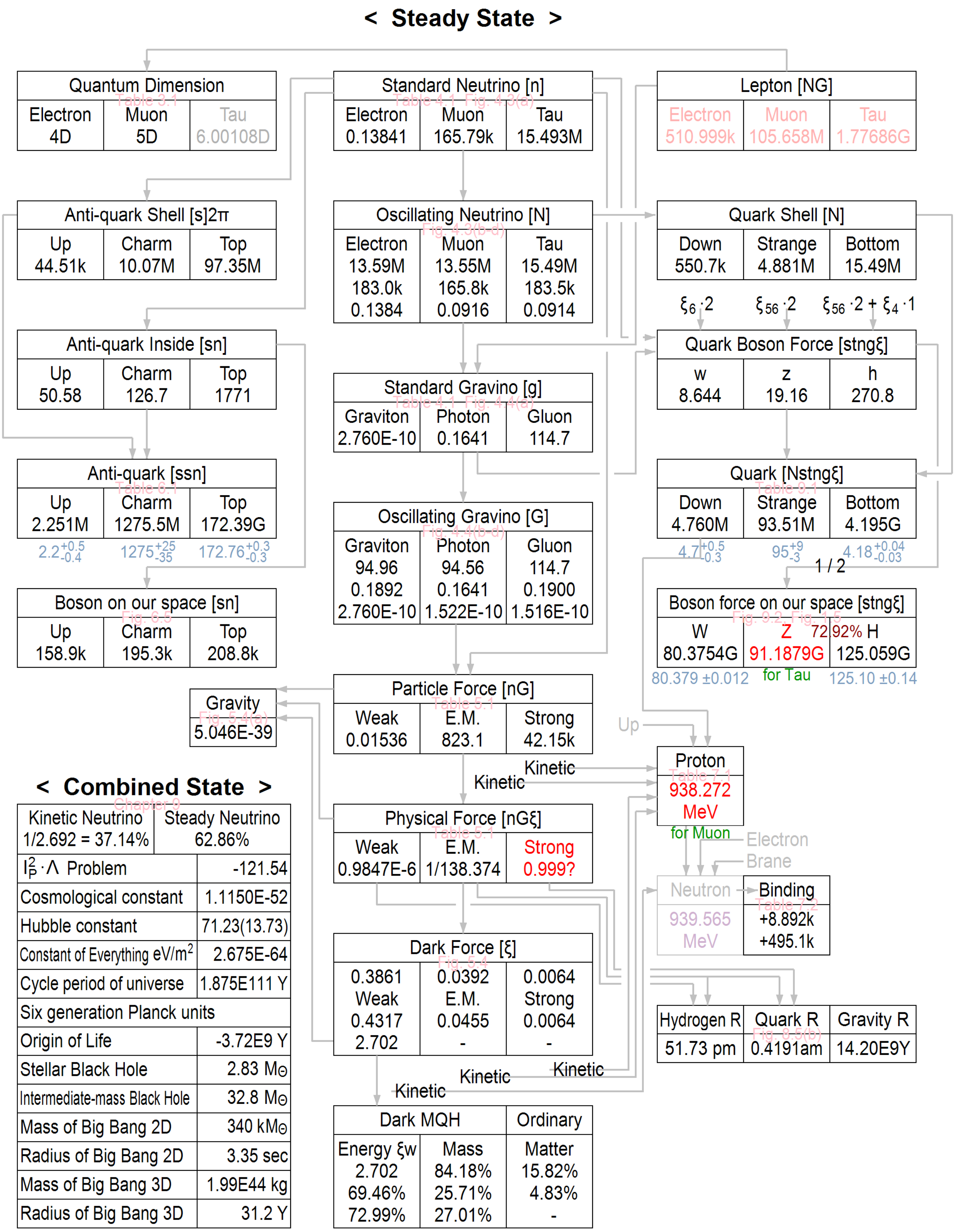

Fig. 2 Analysis of steady state.

2.5 Oscillating Neutrino [N]

As described in Fig. 1.6, neutrinos oscillate according to the logarithmic elliptic equation. The oscillating masses are calculated in Fig. 4.1(b-d) for kinetic state and Fig. 4.3(b-d) for steady state.

2.6 Standard Gravino [g]

Electron, muon, and tau are the combination of neutrinos and gravinos. From this, the standard gravino masses are calculated. The calculation process is presented in Table 4.1, Fig. 4.2(a), and Fig. 4.4(a).

2.7 Oscillating Gravino [G]

As described in Fig. 1.6, gravinos oscillate according to the logarithmic elliptic equation. The oscillating masses are calculated in Fig. 4.2(b-d) and Fig. 4.4(b-d).

2.8 Particle Force [nG]

Particle force is composed of one standard neutrino and one oscillating gravino as shown in Fig. 5.1. The calculation procedure is presented in Table 5.1.

2.9 Physical Force [nGξ]

The calculation process is presented in Table 5.1.

In kinetic state, when the strong coupling constant is 1.0000, the electromagnetic force coupling constant is given as 1/137.036. There are five methods for calculating the weak force coupling constant, which are calculated in Section 5.7.

In steady state, it goes without saying that the strong force coupling constant must be less than 1.0000. However, since the value is not given in physics, it is an input value. The value will have to be calculated from the particle radius measurements of Fig. 7.6.

2.10 Dark Force [ξ]

The difference between particle force and physical force is the dark force, which is dark energy. The process of calculating the three generation dark forces are shown in Table 5.1 and Fig.5.3 – 5.6.

2.11 Gravity

Gravity acts in the direction of 4D empty space, and the weak dark force is added. The calculation process is shown in Fig 5.3.

In kinetic state, for the gravitational coupling constant to be calculated as 5.906E-39, when the muon neutrino mass is 170.00 keV, the tau neutrino mass must be 15.494 MeV by trial & error method.

2.12 Dark Energy : Dark Matter : Ordinary Matter

Since dark matter is a 4D supermassive black hole, its mass is calculated from Schwarzschild formula. The ratio of dark energy to dark matter is dark weak force 2.692. Also, as shown in Fig. 11.6, its value is connected with the ratio of the cosmological constant and the Hubble constant. The right answer is not dark energy, but dark force or dark time.

The dark force in kinetic state is calculated as 2.692 (72.92%) in Fig. 5.3(a), and the dark force in steady state is calculated as 2.702 (72.99%) in Fig. 5.4(a). The change of universe is in kinetic state. Therefore, 2.692 (72.92%) is correct.

2.13 Anti-quark Shell [s]

As shown in Fig. 6.1, up, charm, and top quarks consist of anti-particle s, so they are anti-quarks. The anti-particle s is 2π times larger than the particle n. The mass of the shell fermion is calculated in Table 6.1.

2.14 Anti-quark Inside [sn]

The inside is a sn pair of boson particles, and from the logarithmic elliptic equation, the boson is the super gauge symmetry of the fermion. The mass of the internal boson is calculated in Table 6.1.

2.15 Anti-quark [ssn]

The quark is the combination of the shell fermion and the internal boson. The mass of the quark is calculated in Table 6.1. In kinetic state, there is a slight difference between the calculated results and the measured values in physics. It is understood that quarks are in state state.

2.16 Boson on our space [sn]

Our universe is the world of fermions. Bosons are not particles in our universe. When a quark is destroyed, its inside boson jumps into our universe. Its mass is expected to be Fig. 6.2. In our universe, fermion particle is stationary. Fermion and boson are super gauge symmetric. That is, boson particle in our universe always travels straight at the speed of light. The speed of expansion toward the 4D direction of our universe is the speed of light.

2.17 Quark Shell [N]

As shown in Fig. 8.1, down, strange, and bottom quarks consist of particle n, so they are quarks. The shell fermion oscillates. The mass of the shell fermion is calculated in Table 8.1.

2.18 Quark Boson Force [stngξ]

Its inside consists of the combination of boson force particle and boson force antiparticle. Since it is a force particle, the effect of dark force is added. The calculation process is presented in Table 8.1.

2.19 Quark [Nstngξ]

The quark is the combination of the shell fermion and the internal boson force. The mass of the quark is calculated in Table 8.1.

2.20 Boson force on our space [stngξ]

The boson force is hidden in the quark. When the quark is destroyed, the boson force bounces into our space as shown in Fig.8.2. It can be seen that the mass of the force rises very significantly. That is the Z boson.

2.21 Proton

The shape of proton is shown in Fig. 7.1, and the calculation process is presented in Table7.1.

2.22 Neutron

The shape of neutron is shown in Fig. 7.3, and the calculation process is presented in Table7.2.

3. Combined State

3.1 Mixing of kinetic state and steady state

The universe in Fig. 9.1 changes with the mixture of the 37.14% of kinetic state in Fig. 4.1(a) and the 62.86% of steady state in 4.3(a).

3.2 Cosmological constant problem

The cosmological constant problem in Eq. (9.1) is the correct answer. It is just that the interpretation is wrong. Eq. (9.8) must be applied when interpreting the universe.

3.3 Hubble constant

The cosmological constant time divided by the Hubble time in Fig. 7 is the dark energy ratio of 72.92%. Therefore, the age of universe is calculated as 13.73 billion years.

3.4 Constant of Everything

Regardless of dimensions, 2.675E-64 eV/m^2 must be established. This is constant of everything.

3.5 Cycle period of universe

Regardless of dimensions, the cycle period of all universes is calculated as 1.875E111 LY.

3.6 Six generation Planck units

The universe is composed of 6 dimensions, and the values from Fig. 9.1 to Fig. 9.8 are the dimensional Planck unit system. The whole universe changes as shown in Fig. 9.9. In the chart, the values on 3D should be applied to our universe.

3.7 Origin of life

3D Planck time in Fig. 9.4 is calculated as 10.01 billion years from the cosmological constant 1.1150E052 /m2 in Fig. 9.3. The big bang occurred 13.73 billion years ago. Therefore, 3.72 billion years ago, a new simulation universe was born. This is the origin of life.

3.8 Ordinary matter

The expansion of universe in Fig. 11.5 is calculated from cosmological constant and Hubble constant, which is the relation between Planck star and Black hole. That is, ordinary matter has nothing to do with the expansion of universe.

3.9 Three generation black holes

The minimum masses of stellar black hole, intermediate-mass black hole, and supermassive black hole will be observed as 2.83 M_θ, 32.8 M_θ, and 340 kM_θ of Fig. 10.2.

3.10 Big Bang

The Planck constants presented in physics are interpretations of 0D universe. Since our universe is 3D universe, the 3D value in Fig. 9.1 - 9.8 should be adopted. Therefore, the big bang radius and mass of the universe will be 31.2 years in Fig. 10.3 and 1.99E44 kg in Fig. 10.4.

4. Conclusions

The core for calculating is as follows. 1) All calculations are divided into kinetic state and steady state. 2) Force is analyzed as kinetic state, other particles as steady state, and the universe as combined state. 3) The origin of all things are three generation neutrinos, graviton, photon, and gluon. 4) Logarithmic elliptic equation is established on the origin particles. 5) The origin particles oscillate, and they also are established on logarithmic elliptic equation. 6) Four fundamental forces are established on logarithmic parabolic equation. 7) Dark force always acts on the particle force. 8) Tightly bound particles must be calculated as logarithmic masses, and loosely bound particles must be calculated as arithmetic masses. 9) The characteristic of quantum space determines all the characteristics of particle. 10) Everything must be calculated in terms of dimensions.