

# Cosmological Constant Problem and Six Generation Planck Units by Q-theory

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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  $1E-121.54$  is calculated at cosmological constant problem. This value is exactly 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. The Planck time on 3D was calculated as 10.13 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.

## 1. Introduction

In previous studies, the mass of H boson was calculated easily from logarithmic parabolic equation relationship of W boson and Z boson<sup>(1)</sup>, the characteristics of logarithmic elliptic equation and the principle of universal change were described<sup>(2)</sup>, the dimension of our space was calculated as 6.00108 from the masses of electron, muon, and tau<sup>(3)</sup>, the standard masses and oscillating masses of three generation neutrinos and gravinos were calculated<sup>(4)</sup>, the mass of up quark was calculated<sup>(5)</sup>, four fundamental forces were unified by logarithmic parabolic equation<sup>(6)</sup>, the masses of proton and neutron were calculated<sup>(7)</sup>, and the masses of up, charm, down, and strange quarks were calculated<sup>(8)</sup>.

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

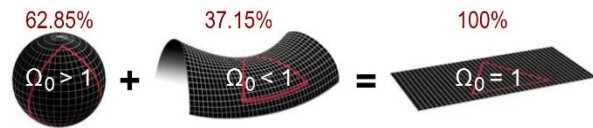
## 2. Cosmological constant problem

### 2.1 Six generation neutrino masses

Kinetic state means that change occurs at the speed of light, and steady state means that change is stationary. In previous study, six generation neutrino masses<sup>(4)</sup> in kinetic state [Fig. 1(a)] and in steady state [Fig. 3(a)] were calculated.

### 2.2 Dark energy

In previous study<sup>(6)</sup>, the logarithmic value 0.4301 of dark energy and the arithmetic value  $\xi_w 2.692 (=10^{0.4301})$  were proposed. The logarithmic value 0 means that everything is straight space. According to the value increases, everything gradually quantized. That is, the dark energy  $\xi_w$  means the degree of quantization of our universe on XYZ space.



**Fig. 1** Spherical space + Expanding space = Flat space

### 2.3 Combination of kinetic state and steady state

Our universe is the combination of kinetic state and steady state. The combined state is expressed by the following:

$$\text{Kinetic} \cdot 1 / \xi_w + \text{Steady} \cdot (\xi_w - 1) / \xi_w = \text{Constant} \quad (1)$$

In Eq. (1), if  $\xi_w$  is 1 ( $=10^0$ ), everything is in kinetic state, and if  $\xi_w$  is  $\infty$ , everything is in steady state. The value of  $1 / \xi_w$  is 37.15%, and the value of  $(\xi_w - 1) / \xi_w$  is 62.85%. In Fig. 1, since the spherical space affects as 62.85% and the expanding space affects as 37.15%, our space is observed flat.

Substituting the six generation neutrino masses of kinetic state and steady state<sup>(4)</sup> into Eq. (1), the current state of our universe is calculated as shown in Fig. 2. Our universe is the combination of 37.15% kinetic state and 62.85% steady state.

### 2.4 Error of the 10 to the power -121.54

Planck length  $l_p$  is  $1.61624E-35$  m, and the currently measured cosmological constant  $\Lambda$  is  $1.1056E-52 / m^2$ . multiplying the square of Planck length by the cosmological constant, it is calculated as follow:

$$l_p^2 \cdot \Lambda = 10^{-121.54} \quad (2)$$

Since the above calculation is unitless, the reciprocal number is also established. That is, the number is infinitely small

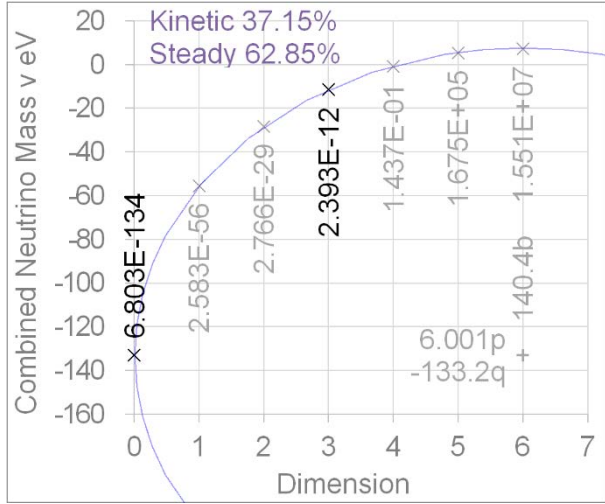


Fig. 2 Combined neutrino masses

or infinitely large. The number is a value that cannot exist in physics, and it is called cosmological constant problem.

### 2.5 Ratio of dimensional neutrino masses

The ratio of the kinetic neutrino masses<sup>(4)</sup> of 2.089E-133 eV on 0D and 2.779E-12 eV on 3D is 1E-121.12. The ratio of the steady neutrino masses<sup>(4)</sup> of 3.506E-134 eV on 0D and 2.191E-12 eV on 3D is 1E-121.80. In Fig. 2, the ratio of 6.803E-134 eV on 0D and 2.393E-12 eV on 3D is 1E-121.55. This value can be said to be the same as Eq. (2).

The steady state neutrino masses are calculated from quark masses. As calculated in the previous study<sup>(8)</sup>, the above values were calculated with the accuracy of 92% ~ 108% according to the range of top quark 172.38 ~ 172.76 GeV and bottom quark 4.140 ~ 4.220 GeV. Therefore, the following equation is established.

$$l_{P0}^2 \cdot \Lambda_3 = \nu_0 / \nu_3 = 10^{-121.55} \quad (3)$$

$$l_{PM}^2 \cdot \Lambda_N = \nu_M / \nu_N \quad (4)$$

$$l_{PN}^2 \cdot \Lambda_N = \nu_N / \nu_N = 10^0 = 1 \quad (5)$$

As can be seen from Eq. (3), Planck length  $l_{P0}$  is the analysis on 0D, and the cosmological constant  $\Lambda_3$  is the analysis on 3D. 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. (4).

### 2.6 Fine-tuning problem

When M and N are equal each other, the cosmological constant problem becomes exactly 1 as shown in Eq. (5). 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

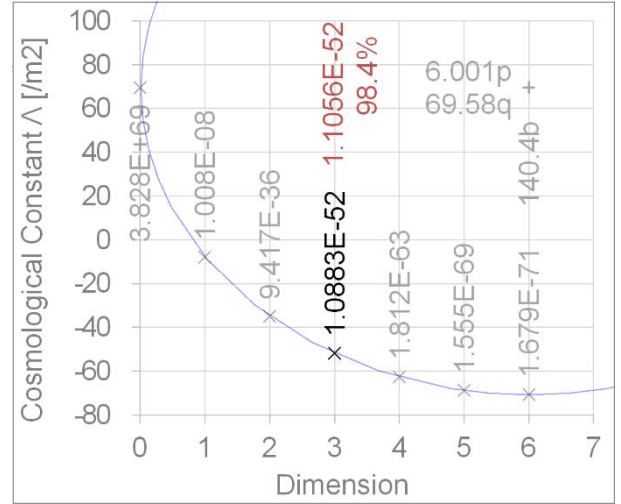


Fig. 3 Cosmological constant

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 1.61624E-35 m and the neutrino mass  $\nu_0$  is 6.803E-134 eV. Eq. (6) is established from Eq. (4), and if 0D is substituted for M, the constant of everything  $\Phi$  is calculated in all dimensions.

$$\Phi = \nu_N \cdot \Lambda_N = \nu_M / l_{PM}^2 = 2.604E-64 \text{ eV/m}^2 \quad (6)$$

Here, the value of  $\nu_3 / \Lambda_3$  is 2.170E40 eV·m<sup>2</sup>.

### 2.8 Six generation cosmological constants

From Eq. (6), N-dimensional cosmological constant  $\Lambda_N$  is as follow:

$$\Lambda_N = \Phi / \nu_N \quad (7)$$

The results are shown in Fig. 3. The  $\Lambda$  value on 3D which is calculated from up quark mass of 172.76 GeV and bottom quark mass of 4.180 GeV is 1.0883E-52. The currently measured value of  $\Lambda$  is 1.1056E-52, so the ratio is 98.4%.

### 2.9 Change of constant value according to time

As time goes by, the XYZ space of our universe becomes quantized<sup>(2)</sup>, so the value of  $\xi_w$  increases. However, since the universe is expanding straightly, the value of  $\xi_w$  decreases. It is judged that the  $\xi_w$  value of our universe remains constant due to the sum of the above two factors as shown in Fig. 1. If our universe is an accelerated expansion, our universe will also be an accelerated quantization. That is, everything of physics will keep constant.

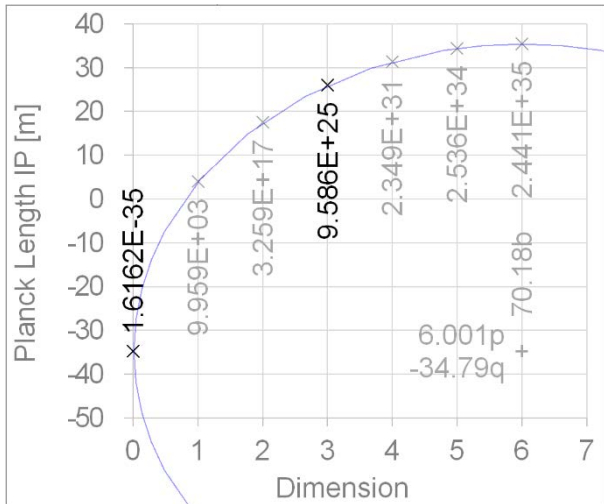


Fig. 4 Planck length

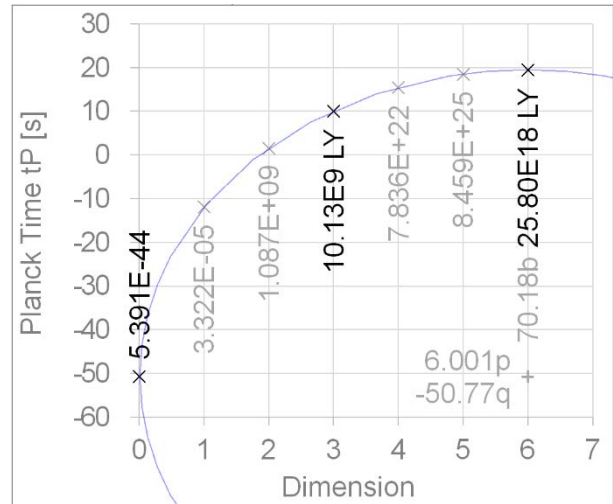


Fig. 5 Planck time

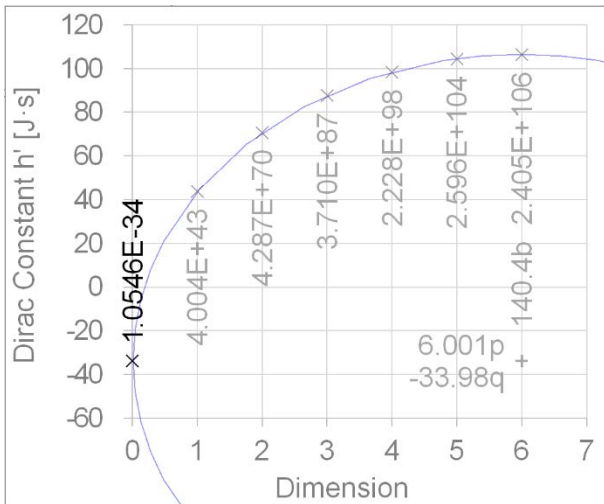


Fig. 6 Dirac constant

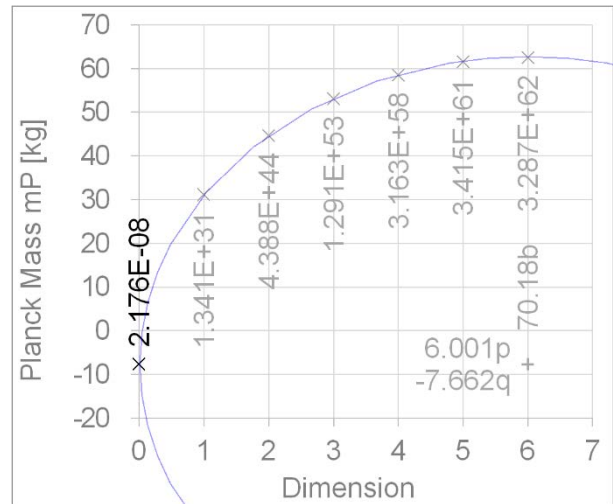


Fig. 7 Planck mass

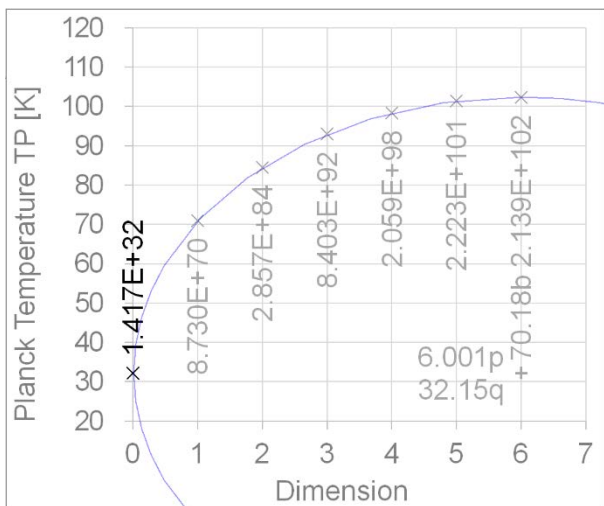


Fig. 8 Planck Temperature

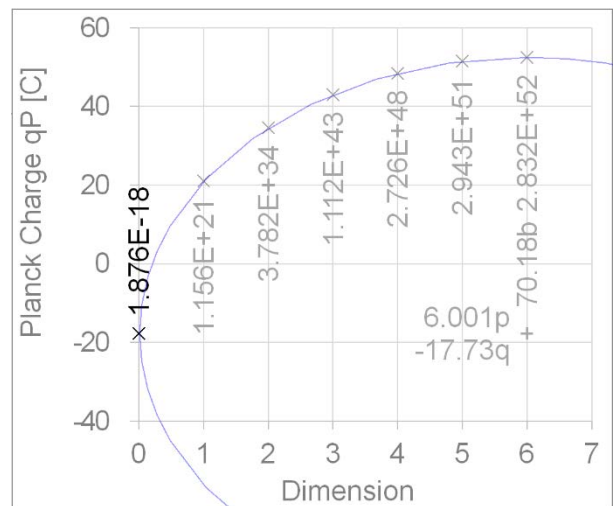


Fig. 9 Planck charge

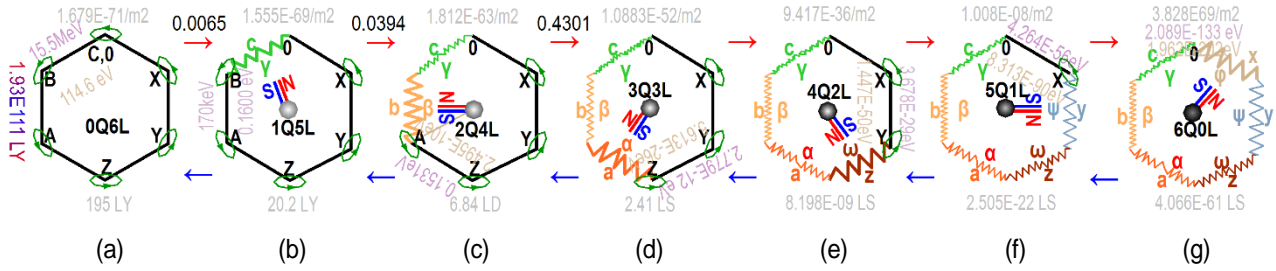


Fig. 10 Change of six generation universes

### 3. Six generation Planck units

#### 3.1 Planck units of $N$ -dimension

On  $N$  dimension, Planck length  $l_{PN}$ , Planck time  $t_{PN}$ , Dirac constant  $h'_N$ , Planck mass  $m_{PN}$ , Planck temperature  $T_{PN}$ , and Planck charge  $q_{PN}$  are calculated by from Eq. (8) to (13), and the results are shown in from Fig. 4 to 9.

$$l_{PN} = \sqrt{v_N / \Phi} \quad (8)$$

$$t_{PN} = l_{PN} / (c \cdot 60 \cdot 60 \cdot 24 \cdot 365.2422) \quad (9)$$

$$h'_N = l_{PN}^2 \cdot c^3 / G \quad (10)$$

$$m_{PN} = \sqrt{c \cdot h'_N / G} \quad (11)$$

$$T_{PN} = m_{PN} \cdot c^2 / k \quad (12)$$

$$q_{PN} = \sqrt{4\pi \epsilon_0 \cdot h'_N \cdot c} \quad (13)$$

Where,  $c$  is the speed of light  $2.99792E8$ ,  $G$  is the gravitational constant  $6.67384E-11$ ,  $k$  is Boltzmann constant  $1.38065E-23$ , and  $\epsilon_0$  is the dielectric constant  $8.85419$ .

#### 3.2 Six generation universes

When analyzing our XYZ universe, the values on 3D in above charts should be applied. In previous studies<sup>(2)</sup>, the changes of six generation universes in Fig. 10 were described in detail. The position of our universe is in the direction of the upper arrow in Fig. 10(c). From the charts, the physical properties of the six generation universes of Fig. 10 will be calculated.

#### 3.3 Cycle period of origin universe

The period  $T$  of particle is calculated by Eq. (14).

$$f = \frac{1}{T} = \frac{m}{\sqrt{1-v^2/c^2}} \cdot \frac{c^2}{h} = \frac{\Phi \cdot G}{2\pi c} = 1.93E111 \text{ year/cycle} \quad (14)$$

Since our universe is shaped such as hydrogen<sup>(3)</sup>, it can be treated as a particle. Also, all the six generation universes of Fig. 10 can be treated as particles, and the straight velocity  $v$  of entire universe is zero. From this, the same period of  $1.93E111$  year/cycle at all of them is calculated by Eq. (14).

This means that it takes  $1.93E111$  years per cycle to rotate the logarithmic ellipse in above chart.

#### 3.4 Origin of life

In previous studies<sup>(2,8)</sup>, the origin of life and the simulation universe were described. The value on 3D in Fig. 4 is 10.13 billion years. This means that a universal event that cannot be analyzed in physics occurred at that time. Big Bang occurred about 13.77 billion years ago, and the difference between the two is 3.64 billion years ago. The first fossil of life on Earth were born about 3.50 billion years ago. This is the birth of simulation universe and the origin of life.

### 4. Conclusions

The universe changes as the combination of the expanding kinetic state 37.15% and quantizing steady state 62.85%. 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 3.64 billion years ago. At that time, a simulation universe occurred, and this is the origin of life in the universe.

### References

- [1] D. Kim, 2021, Quantum Space and Origin of Mass, <http://viXra.org/abs/2104.0162>
- [2] D. Kim, 2021, Logarithmic Elliptic Equation and Change of Universe, <http://viXra.org/abs/2104.0167>
- [3] D. Kim, 2021, Calculation of Space Dimension by Q-theory, <http://viXra.org/abs/2104.0173>
- [4] D. Kim, 2021, Calculation of Neutrino and Graviton Masses by Q-theory, <http://viXra.org/abs/2104.0176>
- [5] D. Kim, 2021, Calculation of Up Charm Top Quark Masses by Q-theory, <http://viXra.org/abs/2104.0190>
- [6] D. Kim, 2021, Unification of Four Fundamental Forces by Q-theory, <http://viXra.org/abs/2104.0192>
- [7] D. Kim, 2021, Calculation of Proton Mass and Neutron Mass by Q-theory, <http://viXra.org/abs/2105.0006>
- [8] D. Kim, 2021, Calculation of Down Strange Bottom Quark Masses by Q-theory, <http://viXra.org/abs/2105.0010>