

# Origin of Light Speed Gravitational Force Planck Constant

Deokjin Kim

EnTEs Institute, Korea. E-mail: [entes@outlook.kr](mailto:entes@outlook.kr)

October 23, 2023

**Keywords:** Cosmological constant, Gravitational coupling constant, Neutrino mass, Planck constant, Speed of light

---

**Abstract** In previous study, the masses of six dimensional neutrinos were calculated and the ratio of the 0D mass to the 3D mass was shown to be cosmological constant problem  $1E-121.54$ . In this study, four values were additionally found. (1) The neutrino root ratio of the 3D mass to the 2D mass is  $2.99789E8$ , and the error is  $0.001\%$  of light speed  $2.99792E8$  m/s. (2) The neutrino root ratio of the 5D mass to the 6D mass is  $88.163\%$ , and the error is  $0.02\%$  of the ratio  $88.145\%$  of  $W$   $80.377$  GeV and  $Z$   $91.1876$  GeV. (3) The neutrino root ratio of the 0D mass to the 1D mass is  $5.9065E-39$ , and the error is  $0.01\%$  of gravitational coupling constant  $5.90595E-39$ . (4) From 2D gravino mass  $2.2504E-50$  eV/c<sup>2</sup> that is photon,  $6.5836E-16$  eV·s is calculated, and the error is  $0.023\%$  of Dirac constant  $6.5821E-16$  eV·s. It was once again confirmed that the origin of all things is neutrinos and gravinos.

---

## 1. Introduction

In this paper, the speed of light  $c$ , the mass ratio of  $W/Z$ , gravitational coupling constant  $\alpha_G$ , and Planck constant  $h$  are newly calculated based on the results of previous study [1]. The word "Gravino" is a word made by the author and refers to graviton, photon, and gluon series.

## 2. Previous Results

### 2.1 Six-dimensional neutrino masses

Fig. 1(a, c, e) are the masses of six-dimensional neutrinos, which were calculated in Fig. 4a, Fig. 6a, Fig. 8a in Ref. [1]. There is a slight difference in values, but it is very small and can be ignored.

### 2.2 Six-dimensional Planck lengths

The six-dimensional Planck length for the combined state was calculated in Fig. 25(b) of Ref. [1], and it is Fig. 1(f). It is the combined values of kinetic state (b) and steady state (d), and they were not presented in Ref. [1].

### 2.3 Kinetic state, Steady state, Combined state

The author continued to insist that quantum particles are divided into kinetic state and steady state, and the universe changes into the combined state. In physics, Planck length is given as  $1.61626E-35$  m. The author judges that it is the value of steady state. In Fig. 22 of Ref. [1], the kinetic state radius of proton was calculated to be  $0.87506$  fm, and the steady state radius of proton was calculated to be  $0.84101$  fm. As shown in the top equation of Fig. 1(b), the Planck length in kinetic state will be  $1.64865E-35$  m. Fig. 2 is the Fig. 18 of Ref. [1]. The kinetic state was calculated to be  $37.144\%$ ,

and the steady state was calculated to be  $62.856\%$ . Therefore, the Planck length in combined state is calculated as  $1.62821E-35$  from the bottom of Fig. 1(f).

### 2.4 Cosmological constant problem

The cosmological constant problem  $l_p^2 \cdot \Lambda$  is the value  $1E-121.5394$  ( $= 1.61626E-35$  m<sup>2</sup>  $\times$   $1.1056E-52$  / m<sup>2</sup>). The combined state (e) is kinetic state (a)  $\times$   $37.144\%$  + steady state (c)  $\times$   $62.856\%$ . In (e),  $v_0$   $7.0356E-134$  /  $v_3$   $2.3990E-12$  is  $1E-121.5327$ .

### 2.5 Quantization unit of the universe

The cosmological constant calculated at Chapter 5.25 of Ref. [1] is  $1.10626E-52$  /m<sup>2</sup>, and as shown in the upper left of Fig. 2, the  $1/c\sqrt{\Lambda}$  is calculated as  $10.050E9$  LY. This value is a combined state and is a constant that cannot be changed as the quantization unit of the universe. In physics, cosmological constant  $\Lambda$  is given as  $1.1056E-52$  /m<sup>2</sup> and the  $1/c\sqrt{\Lambda}$  is  $10.053E9$  LY.

### 2.6 Constant in all dimensions

$v_0/l_{p0}^2$  is calculated as a constant in all dimensions. Let's call this value  $\Phi$ . This value is calculated in (a) (c) (e). Therefore, the dimensional Planck length  $l_{pN}$  is equal to  $\sqrt{v_N/\Phi}$ , and these values are calculated as kinetic state (b) and steady state (d). The combined state (f) is kinetic state (b)  $\times$   $37.144\%$  + steady state (d)  $\times$   $62.856\%$ .

### 2.7 Origin of all things = Neutrinos

The Planck length  $l_p$  was calculated from the mass of neutrino  $v$ . In Chapter 3, combinations of Planck lengths were calculated. Here, it must be remembered that the origin of Planck length is the mass of neutrino.

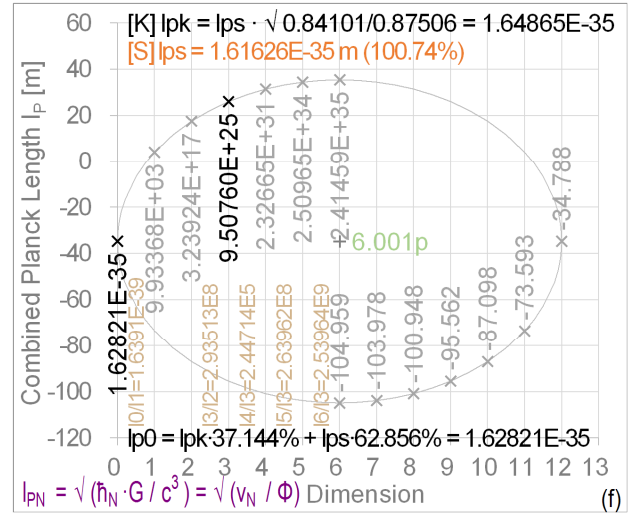
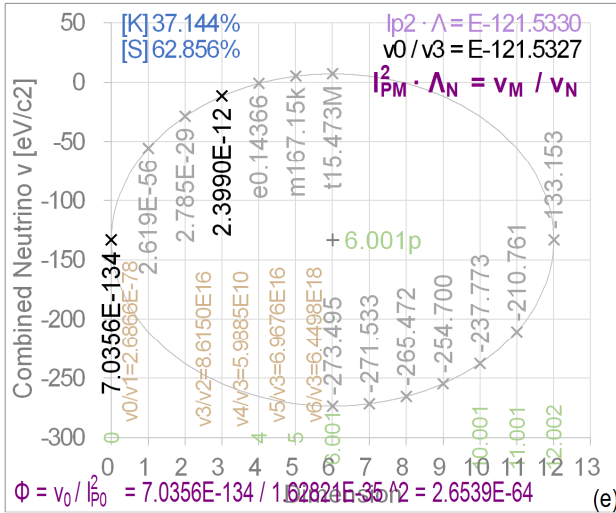
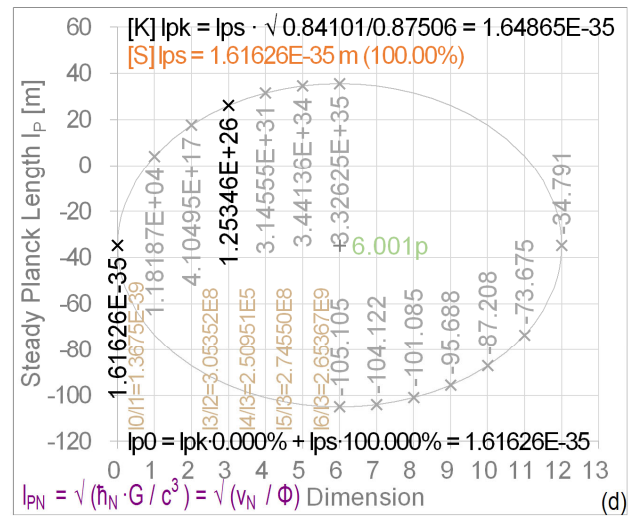
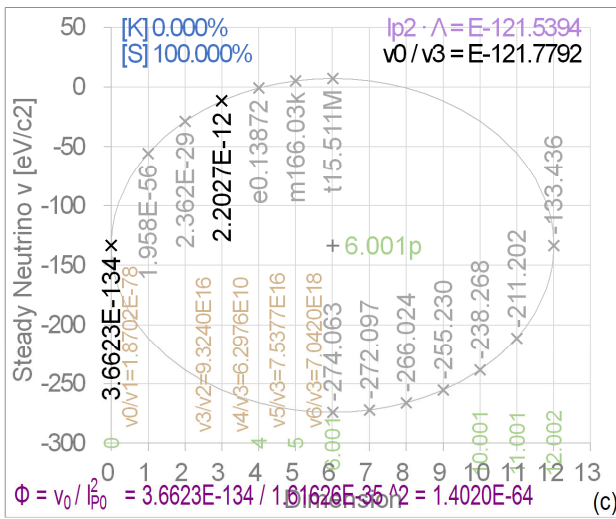
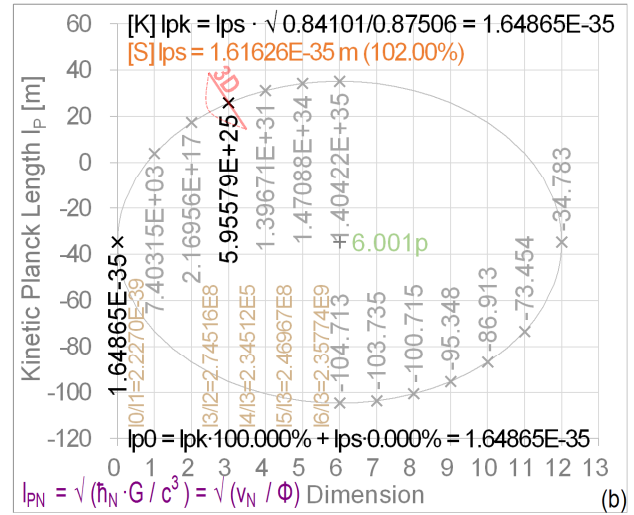
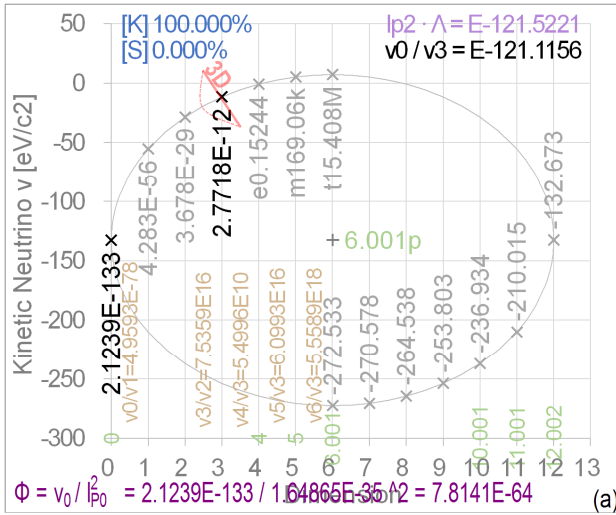


Fig. 1 Six-dimensional neutrino masses and Six-dimensional Planck's constants

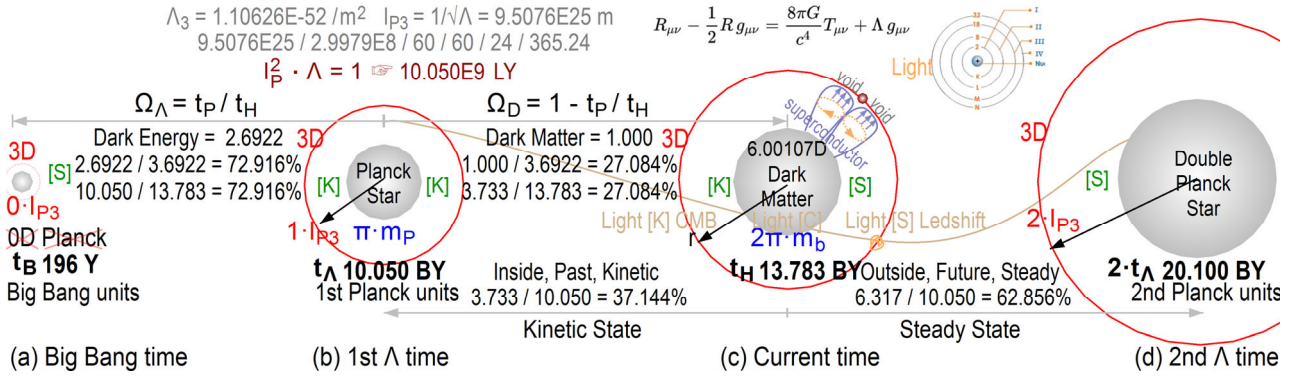


Fig. 2 Dark energy 72.916%, Dark matter 27.084%, Kinetic state 37.144%, Steady state 62.856%

### 3. Origin of Light Speed 2.99792E8 m/s

#### 3.1 Six-dimensional Planck lengths

In Table 1, six-dimensional Planck lengths are presented. The kinetic state is the values in Fig. 1(b), and the steady state is the values in (d). The combined state is the values in (f), Eq. (1) is logarithmic combined state, and Eq. (2) is simple combined state.

#### 3.2 Speed of light wave

From Eq. (3), 2.98013E8 is calculated, which is an error of 0.593% of the speed of light. From Eq. (4), 2.99789E8 is calculated, which is an error of 0.001% of the speed of light. From Eq. (5), 2.99887E8 is calculated, which is an error of 0.032% of the speed of light. Is this result coincidental or inevitable? There is an error of about 0.03% in the author's overall calculation. Which is the correct answer between Eq. (4) and Eq. (5)? If both of the above are correct, a formula that is difficult to understand is derived.

#### 3.3 Velocity c [m/s] Unitless

Since the calculated value is unitless constant, it can be

seen that the speed of light must also be unitless. To easily express the above equation,  $l_{P3} : l_{P2} = 2.99792E8$  m at 3D : 1s at 2D.

#### 3.4 Mass eV/c<sup>2</sup> & Energy eV Unitless

The unit of mass is eV/c<sup>2</sup>, but in previous study [1], it was calculated that mass in quantum space is the log sum or log average. Therefore, the mass eV/c<sup>2</sup> is unitless. Since the speed of light c is also unitless, the energy eV is also unitless. However, rather than being completely unitless, the combination of quantum dimensions are units.

#### 3.5 Absolute length & Absolute time

In above, the absolute constant  $\Phi$ , which does not change in all dimensions, was calculated. Let's apply absolute time 1s, which does not change in any circumstances. And let's define 1s = 1m at 2D. Therefore,  $l_{P3} : l_{P2} = 2.99792E8$  m at 3D : 1m at 2D is established, and this is unitless. That is, 1 second in the 2D universe is 1 meter, and 1 second in the 3D universe is 2.99792E8 m. In this way, there are not physical units in the universe, but there are dimensions in the universe.

Table 1 Six-dimensional Planck lengths and their combinations

Dim	[K]inetic	[S]teady	[C]ombined	
	37.144%	62.856%	Log	Value
	Fig. 1(b)	Fig. 1(d)	Fig. 1(f), (1,7)	(2,3,9)
l <sub>P0</sub>	1.64865E-35	1.61626E-35	1.62821E-35	1.62829E-35
l <sub>P1</sub>	7.40315E03	1.18187E04	9.93368E03	1.01786E04
l <sub>P2</sub>	2.16956E17	4.10495E17	3.23924E17	3.38607E17
l <sub>P3</sub>	5.95579E25	1.25346E26	9.50760E25	1.00909E26
l <sub>P4</sub>	1.39671E31	3.14555E31	2.32665E31	2.49596E31
l <sub>P5</sub>	1.47088E34	3.44136E34	2.50965E34	2.70945E34
l <sub>P6</sub>	1.40422E35	3.32625E35	2.41459E35	2.61234E35

(1)  $10^4 (\log [K] \cdot 37.144\% + \log [S] \cdot 62.856\%)$  (2)  $[K] \cdot 37.144\% + [S] \cdot 62.856\%$   
 (3)  $l_{P3/P2}^2 = 1.00909E26 / 3.38607E17 = 2.98013E8$  (0.59% of c2.99792E8)  
 (4)  $l_{P3/P2}^2 = l_{P3/P2}^K \cdot 37.144\% + l_{P3/P2}^S \cdot 62.856\% = 2.93898E8$   
 $l_{P3/P2}^K / l_{P3/P2}^S = 2.99789E8$  m/m (0.001% of c2.99792E8 m/s) Speed of light wave

(5)  $l_{P6/P3}^C = l_{P6/P3}^K \cdot 37.144\% + l_{P6/P3}^S \cdot 62.856\% = 2.54375E9$   
 $l_{P6/P3}^C / l_{P3/P2}^K \cdot 3/8\pi = 2.99887E8$  (0.032% of c2.99792E8)  $l_{P6}^C / l_{P3}^C \cdot 3/8\pi$   
 Speed of light wave  
 \* Eq.(4)  $\frac{l_{P3}^C}{l_{P2}^C} \cdot \frac{l_{P0}^K}{l_{P0}^S} = \text{Eq.(5)} \frac{l_{P6}^C}{l_{P3}^C} \cdot \frac{l_{P0}^K}{l_{P0}^S} \cdot \frac{8\pi}{3}$  What?  
 (6) CMB · K(t) + RedShift(t) · S(t) = Constant 70.93 km/s/Mpc  
 (7)  $l_{P5/P6}^C / l_{P0}^K \cdot 8\pi/3 = 88.163\%$  (0.020%)  $l_{P5}^C / l_{P6}^C \cdot 8\pi/3$  W/Z  
 (8)  $l_{P5/P3}^C = l_{P5/P3}^K \cdot 37.144\% + l_{P5/P3}^S \cdot 62.856\% = 2.64304E8$   
 $l_{P5/P3}^C / c = 88.162\%$  (0.020% of W80.377/Z91.1876 = 88.145%)  
 \* Eq.(7)  $\frac{l_{P5}^C}{l_{P6}^C} \cdot \frac{l_{P0}^K}{l_{P0}^S} \cdot \frac{8\pi}{3} = \text{Eq.(8)} \frac{l_{P5}^C}{l_{P3}^C} / c \Leftrightarrow c = (5)$   
 (9)  $1 - l_{P3/P2}^K / l_{P5/P3}^C = 2.74516E8 / l_{P5/P3}^C = 2.74550E8 = 0.012\%$  (4)  $\approx$  (8)  
 (10)  $l_{P0/P1}^C \cdot (2.6922+1) = 5.9065E-39$  (0.010% of  $\alpha_G$  5.90595E-39)  $l_{P0}^C / l_{P1}^C \cdot 3.6922$   
 Gravitational force  
 (11)  $l_{P3}^C / l_{P2}^C \cdot l_{P2}^K / l_{P1}^K = E21$  Speed of gravity wave  
 (12)  $l_{P1/P0}^C = E38$   $l_{P2/P0}^C = E52$   $l_{P3/P0}^C = E60$  Speed of wave-particle duality

### 3.6 $c = 3D$ quantization / $2D$ quantization at Eq. (4)

$l_{p3}$  is the quantization unit length (time, mass) of 3D universe, and  $l_{p2}$  is the quantization unit length (time, mass) of 2D universe. To explain it simply, 3D universe is our universe, and 2D universe is inside supermassive black hole. Here, the meaning of the quantization unit can be understood from Fig. 2. It is very shocking that our universe is quantized. The quantization unit is the cosmological constant  $\Lambda$ , and the ratio of time is the ratio of dark energy. In previous study [2], it has been computationally proven that the expansion rate of the universe is constant. Therefore, the speed of light is the expansion velocity ratio of 3D universe and 2D universe.

### 3.7 $c = 6D$ quantization / $3D$ quantization at Eq. (5)

The explanation is the same as above.

### 3.8 Why we can't reach the speed of light?

Our universe exists in 3D in Fig. 1, and the speed of light is the value of 3D/2D. At the speed of light, 3D objects are quantized into 2D. Einstein's general theory of relativity is just a theory that interprets 3D space. 2D, 1D, and 0D also exist.

### 3.9 Lorentz transformation formula

If 3D spaceship flies at the speed of light, it will be quantized into 2D spaceship. The process of the change will follow the logarithmic ellipse from 3D to 2D in Fig. 1. If this were true, Lorentz transformation formula would have to be derived from the logarithmic elliptic equation.

### 3.10 Theory of general relativity

In Fig. 1, 3D is the characteristic of our entire universe, and general relativity is a theory that interprets the interior of the 3D universe. That is, if the entire universe is interpreted with general relativity, errors occur.

### 3.11 Principle of constancy of light speed

The speed of light is the ratio of 3D quantization and 2D quantization and is not related to observer's position or time. The concept of the combined speed of light described above is a constant that does not change. Here, it is known that the universe is expanding with an accelerated velocity. In Fig. 2 of Ref. [3], Eq. (6) was presented. The speed of light also has kinetic speed, steady speed, and combined speed. Since the above formula is the interpretation of the combined state, the speed of light  $2.99792E8$  m/s is the combined state and is constant that does not change. In Eq. (6), the ratio  $K(t)$  and the ratio  $S(t)$  change over time. Here, the author believes that CMB speed will not change. From this, Red Shift (t) is calculated to accelerate expansion.

### 3.12 Change of the universe

In Fig. 29 of Ref. [1], the author attempted to calculate the changes of particles and forces over time, but it did not work well. From the above logic, in Fig. 1, it is judged that over time, the kinetic state and the combined state are constants, and the steady state is variable. From these conditions, it seems that the change of universe can be calculated. However, if this is true, Eq. (4) is incorrect because the  $l_{p0}^S$  changes, and Eq. (5) is correct because all are constants.

## 4. Origin of the mass ratio of W / Z 88.145%

### 4.1 Dark energy & Dark matter $\rightarrow$ Dark time

In Fig. 2, the dark time from (b) to (a) is dark energy 72.916% or 2.6922, and the dark time from (b) to (c) is dark matter 27.084% or 1. Therefore, the time from (a) to (c) is 3.6922.

### 4.2 The mass ratio of Z / H 72.916%

The mass of Z boson is 91.1876 GeV, the mass of H boson is about 125.1 GeV, and the ratio of Z / H is about 72.89%. This value is very similar to 72.916%. From this, the mass of H boson would be 125.06 GeV.

### 4.3 Logarithmic parabolic equation

Fig. 3 is the Fig. 10 of Ref. [1]. From this chart, the mass of W boson is calculated to be 80.376 GeV, and the average of the current measurements is 80.377 GeV.

### 4.4 The mass ratio of W / Z 88.145%

This means that the assumption above of Z / H = 72.916% is correct. From this, it can be seen that the value 88.145% of W 80.377 GeV / Z 91.1876 GeV must also have a certain meaning. However, previous study did not find the value.

### 4.5 Logarithmic elliptic equation

The errors of all values calculated in Ref. [1] are within 0.03% at the smallest and 0.1% at the largest. In Eq. (7), 88.163% is calculated, and the error is 0.020%. In Eq. (8), 88.162% is calculated, and the error is 0.020%. Why are the above two results exactly the same? This is the value of elliptic equation, and Fig. 3 is the value of parabolic equation. The parabola and the ellipse are connected to each other.

### 4.6 Eq. (5) is the correct answer

Eq. (7) and (8) are the same. From this, Eq. (5) is derived. Therefore, Eq. (5) is confirmed to be correct.

### 4.7 Eq. (4) may be the correct answer

The error of Eq. (9) is 0.012%. The numerator is similar to Eq. (4), and the denominator is similar to Eq. (8). Eq. (4) may be also the correction answer.

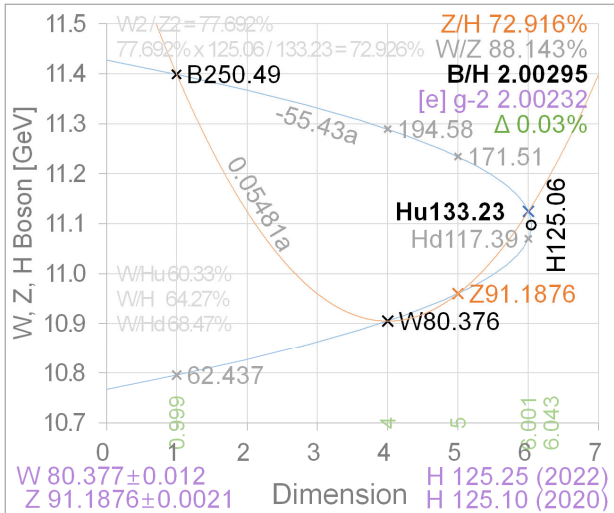


Fig. 3 Integration of W Z H

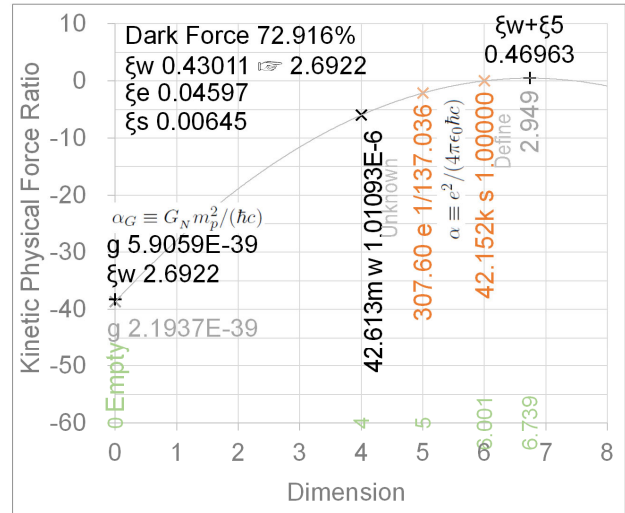


Fig. 4 Unification of four fundamental forces

## 5. Origin of Gravitational Force 5.90595E-39

### 5.1 Particle force

The shapes of strong, electromagnetic, and weak forces are shown in Fig. 3(b) of Ref. [1]. That is, force is particle.

### 5.2 Origin of all things

As described in Ref. [4], the origin of all things is the nature of quantum space. Quantum particles do not have unique characteristics, but quantum space gives quantum particles their unique characteristics. That is, Fig. 1 is the characteristics of quantum space.

### 5.3 Logarithmic parabolic equation

Fig. 4 is the Fig. 16(b) of Ref. [1]. From the logarithmic parabolic equation, the 0D value is calculated as 2.1937E-39, and multiplying by 2.6922 in Fig. 2, the gravitational coupling constant is calculated as 5.9059E-39. Why is the logarithmic parabola established in the relationship of forces?

### 5.4 Logarithmic elliptic equation

The calculated value 5.9065E-39 of Eq. (10) is an error of 0.010% of gravitational coupling constant of 5.90595E-39. What is unique is that the 0D value was multiplied by 2.6922 in the parabola of Fig. 4, and the  $l_{p0}^c / l_{p1}^c$  value was multiplied by 3.6922 in the ellipse of Table 1. From this, the parabolic equation and the elliptic equation were connected to each other.

### 5.5 What is gravitational coupling constant?

In Fig. 3, the strong force of 6D, the electromagnetic force of 5D, and the weak force of 4D are particles, but the gravity of 0D is something unusual, not a particle. The speed of light

in our 3D universe was  $l_{p3} / l_{p2}$  from Eq. (4). The gravitational coupling constant  $\alpha_G$  was  $l_{p0} / l_{p1}$  from Eq. (10). From this,  $1 / \alpha_G$  is  $l_{p1} / l_{p0}$ , and this value is assumed to be the speed of light in 1D universe. Here, 1D means a specific direction. Gravity has a velocity of 1D acting toward the center of object. Since formulas and calculation could not proceed any further, I would like to stop further explanation.

### 5.6 Speed of gravity wave

Our universe is 3D. Photon is judged to be 2D. In Eq. (4), the speed of light is 3D/2D. The graviton is believed to be 1D. Then, the speed of gravity in Eq. (11) would be E21 m/s.

## 6. Origin of Planck Constant 6.62607E-34 J·s

### 6.1 Dirac constant

In cosmology, Dirac constant  $\hbar$  is used, and the value of  $\hbar$  6.5821E-16 eV·s is presented in Fig. 5(d). The formula is  $\hbar = m$  (mass of 1 photon) ·  $c$  (light speed) ·  $\lambda$  (wavelength).

### 6.2 Mass of gravinos

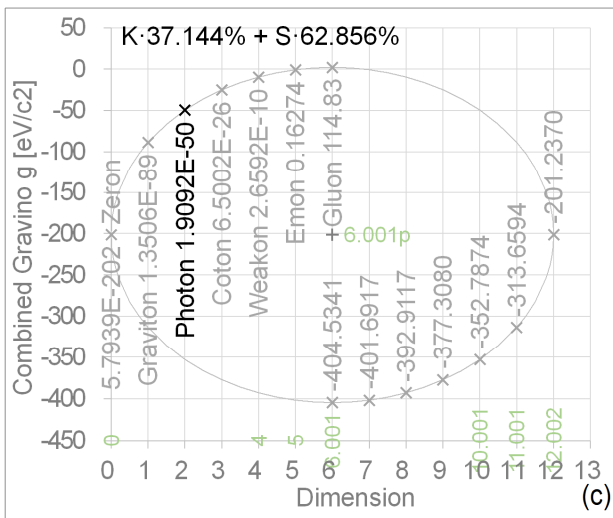
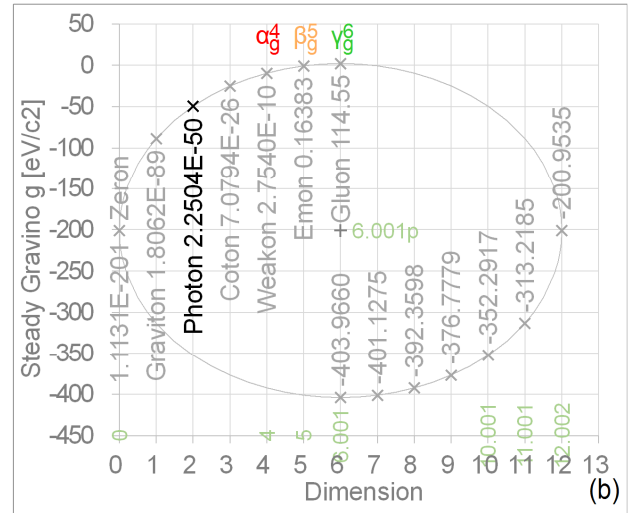
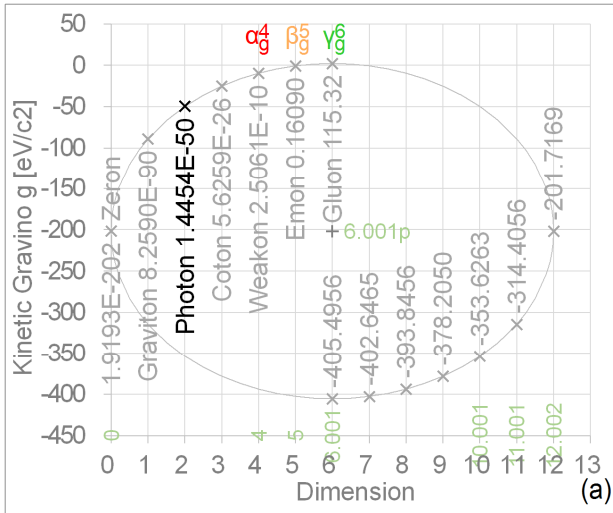
Fig. 5 is the masses already calculated in Fig. 5(a) 7(a) 9(a) of Ref. [1]. The neutrinos in Fig. 1 create the shape of particle, and the gravinos in Fig. 5 give the force to particle. Here, let's apply the value of 2D to the mass of 1 photon.

### 6.3 3D space quantization unit

Let's apply  $l_{p3}$  in Table 1 to the wavelength of photon.

### 6.4 Calculation

Substituting the above values, the value is calculated as about E-16, which is very similar to Dirac constant  $\hbar$



$$E = \hbar c / \lambda = mc^2 \quad \hbar = m \cdot c \cdot \lambda \quad \hbar_2 = m_{g_2}^s \cdot c \cdot l_{p_3}^c$$

$E$  Energy of 1 photon  
 $\hbar$  Dirac constant,  $h/2\pi$  (cosmology) Ground energy  
 $m$  Mass of 1 photon  $m_{g_2}$  Cause Force in 2D [S]  
 $\lambda$  Wavelength of 1 photon  $l_{p_3}$   $1/c\sqrt{\Lambda} = 10.05E9$  LY [C]

	[K]	[S]	[C]	log [C]	value
$\hbar$	eV·s	6.5821E-16	6.5821E-16	6.5821E-16	6.5821E-16
$m_{g_2}^s$	eV/c2	1.4454E-50	2.2504E-50	1.9092E-50	1.9514E-50
$c$	m/s	2.9979E08	2.9979E08	2.9979E08	2.9979E08
$l_{p_3}^c$	m	5.9558E25	1.2535E26	9.5076E25	1.0091E26
$\hbar_2$	eV·s	2.5808E-16	8.4565E-16	5.4417E-16	5.9033E-16

$\hbar_2 = 2.2504E-50 \cdot 2.9979E08 \cdot 9.5076E25 = 6.4143E-16$  (2.55%)  
 $\hbar_2 = 6.4143E-16 \cdot l_{p_0}^{K/S} \cdot \sqrt{l_{p_0}^{K/C}} = 6.5836E-16$  (0.023%) (d)

Fig. 5 Origin of Planck constant and photon

6.5821E-16 eV·s. In physics, Planck length is given as 1.61626E-35 m. The author judges that it is the value of steady state. As such, Dirac constant will also be steady-state value. Therefore, the 2D mass 2.2504E-50 of [S] is applied. As can be seen in Table 1, the 3D length 9.5076E25 of [C] is applied. The calculated value is 2.55% error from the correct answer. There is  $l_{p_0}^{K/S}$  in the light speed calculation formula of Eq. (4), and  $l_{p_3}^c$  is  $1/\sqrt{\Lambda}$ . When corrected in the form above, the value is calculated with 0.023% error from the correct answer.

### 6.5 Light: dimension, mass, wave field

Therefore, it has been proven that light exists in 2D. This means that Eq. (4) in Table 1 is also the correct answer. The mass of light is 1.9092E-50 eV/c2. The 4D, 5D, and 6D are particles, and the 1D, 2D, and 3D are wave fields.

### 6.6 Naming

The new naming is presented in Fig. 5. The 6D is Gluon, the 5D is Emon (ElectroMagnetic + on), the 4D is Weakon (Weak + on), the 3D is Coton (Cosmos + ton), the 2D is Photon, the 1D is Graviton, and the 0D is Zeron (Zero + on).

### 6.7 Light speed vs. Electromagnetic speed

Therefore, the speed of light (2D) is Eq. (4), and the speed of electromagnetic force (5D) is Eq. (5).

### 6.8 Meaning of Planck constant

The wavelength of one photon in the ground state is 9.5076E25 m, and one photon in the ground state extends from (b) to (d) in Fig. 2. The energy unit of one photon in the ground state is Planck constant  $\hbar$ .

### 6.9 Uncertainty principle

As can be understood from the photon wavelength diagram in Fig. 2, one photon basically contains energy corresponding to Planck constant. It can't be smaller than that. This gives rise to the uncertainty principle.

### **6.10 Wave–particle duality**

Light that exists in 2D is a wave field that extends to 10.050 BY. When light enters the 4D, 5D, and 6D quantum space, it changes into particle. Also, when light enters 0D, the wave and particle become exactly the same. Here, there is a question as to how light that exists over 10.050 BY can be turned into particle in an instant. Eq. (4) is the speed at which 2D light waves propagate in 3D space, and Eq. (12) is the speed at which 2D light waves are converted into 0D dual light. That is, this means that a light wave of 10.050 BY instantly turns into photon grain.

## **7. Conclusions**

In previous study, the origin of cosmological constant problem was solved from the masses of six-dimensional neutrinos. In this study, the speed of light,  $W/Z$  mass ratio, gravitational coupling constant, and Planck constant were additionally discovered, and the errors were within 0.03%. From this, it is once again confirmed that the origin of all things is the six-dimensional neutrinos and gravinos.

## **References**

- [1] D. Kim, 2022, New Standard Model, <https://vixra.org/pdf/2207.0003v5.pdf>
- [2] D. Kim, 2022, The Universe Exists on Quantum Space inside a 4D Black Hole, <https://vixra.org/pdf/2211.0111v2.pdf>
- [3] D. Kim, 2023, Solution of Hubble Tension, <https://vixra.org/pdf/2304.0109v2.pdf>
- [4] D. Kim, 2023, Origin of Quantum Mass and Cause of Koide Formula, <https://vixra.org/pdf/2305.0054v2.pdf>