Unification of Four Fundamental Forces by Q-theory

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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 of three generation dark forces is the dark energy. The four fundamental forces are unified by logarithmic parabolic equation. From this, the weak force is calculated as 1.010E-6 and the gravitational force as 5.904E-39.

1. Introduction

In previous studies, the mass of H boson was calculated easily from logarithmic parabolic equation relationship of W boson and Z boson[1], the characteristics of logarithmic elliptic equation and the principle of universal change were described[2], the dimension of our space was calculated as 6.00108 from the masses of electron, muon, and tau[3], the standard masses and oscillating masses of three generation neutrinos and gravinos are calculated[4], and the mass of up quark is calculated as 2.254 MeV[5].

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

2. Shape of four fundamental forces

2.1 Three generation quantum spaces

There are three generation quantum spaces, and they make three generation particles and give them properties[1]. 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 of neutrinos and gravinos[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 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

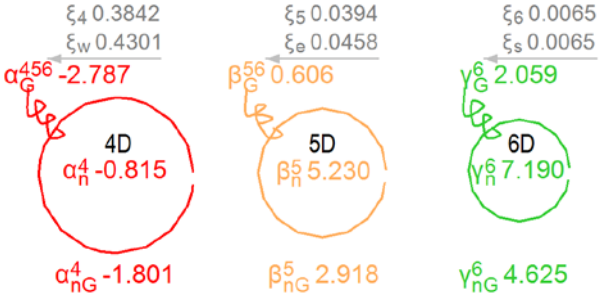

Fig. 1 Shape of particle forces in kinetic state

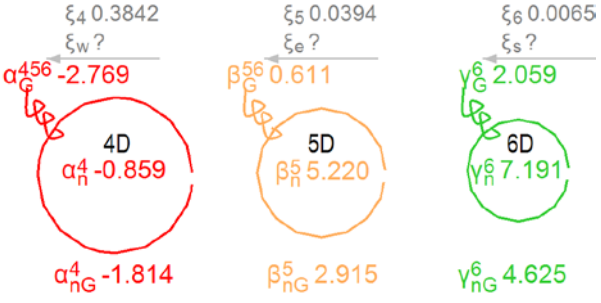

Fig. 2 Shape of particle forces in steady state

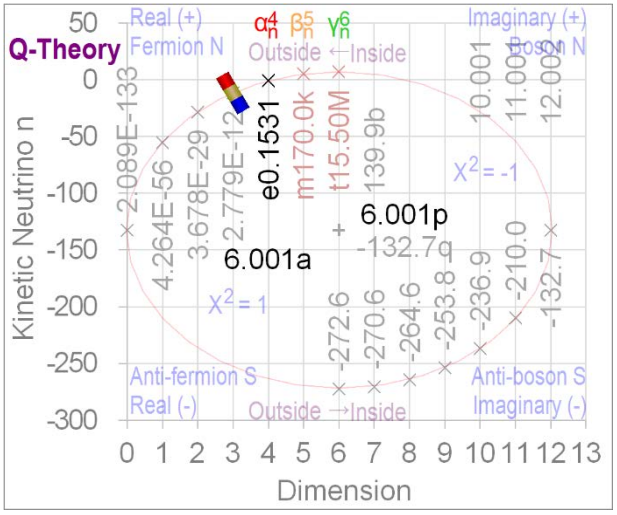

Fig. 3 Standard neutrino masses for kinetic state

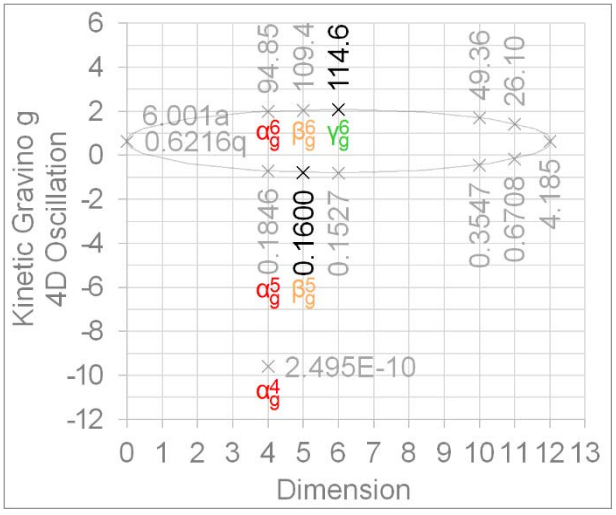

Fig. 4 4D oscillating gravino masses for kinetic state

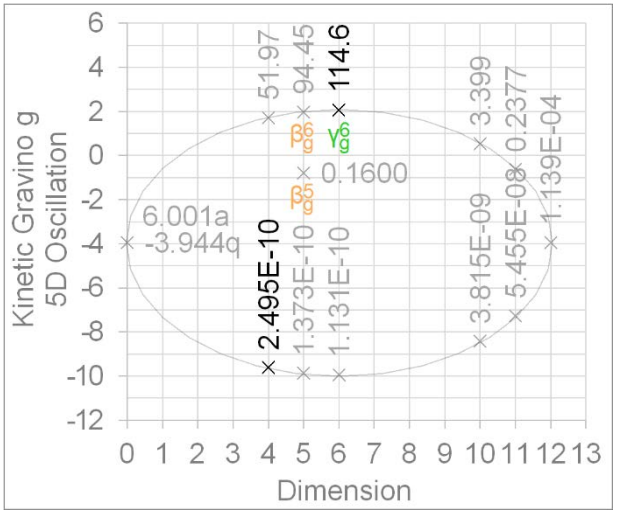

Fig. 5 5D oscillating gravino masses for kinetic state

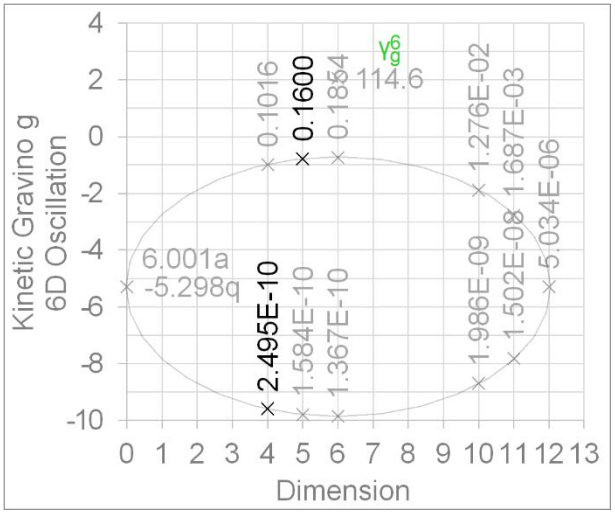

Fig. 6 5D oscillating gravino masses for kinetic state

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[3,4] such as Fig. 1 and Fig. 2. Force particles always react with other particles, so force is always in kinetic state.

If the force particle is perfectly isolated, it may be a steady state. However, since three generation of dark forces act toward our universe from the outside of our universe, the four fundamental force particles is always in kinetic state.

2.6 Shape in combined state

Force particle may be composed of the combination of kinetic state and steady state. However, as the result of author's overall calculation, force particle is in kinetic state.

3. Weak Force

3.1 Standard neutrino masses

In previous study[4], the masses of three generation neutrinos and gravinos were calculated. The standard masses of three generation neutrinos are shown in Fig. 3. The muon neutrino mass 170 keV and the tau neutrino mass 15.5 MeV are the values measured in physics, and the electron neutrino mass 0.1531 eV is the value calculated by author. These values are presented in Table 1.

3.2 Oscillating gravino masses

The oscillating masses of three generation gravinos are shown in Fig. 4-6. All must be calculated as logarithmic mass. The values calculated from Equation 1) in Table 1 are presented in Table 1. The oscillation phenomenon is described in detail in previous study[4].

Table 1 Analysis of four fundamental forces.

Term	Sub.	Kinetic State			Steady State			Unit	Symbol		
Neutrino	Fig. 3	Electron	Muon	Tau	Electron	Muon	Tau				
	Standard	0.1531	170.0k	15.50M	0.1384	166.0k	15.52M	eV			
		-0.815	5.230	7.190	-0.859	5.220	7.191	log	α_n^4	β_n^4	γ_n^4
Gravino	Fig. 4-6	Graviton	Photon	Gluon	Graviton	Photon	Gluon				
1)	Oscillating	-2.787	0.606	2.059	-2.769	0.611	2.059	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
		0.01582	828.0	42.15k	0.01536	823.0	42.15k	eV	m_w	m_e	m_s
		-6.426	-1.707	0.000	-6.439	-1.709	0.000	log			
	Physical	about	1/137.036	1	-	-	-	eV			
		1E-6	-2.137	0.000	-	-	-	log	$\xi_w = 0.4301$		

1) $\alpha_G^{456} = (Fig4\ \alpha_q^4 + \alpha_q^5 + \alpha_q^6)/3 \quad \beta_G^{56} = (Fig4\ \beta_q^5 + \beta_q^6 + Fig5\ \beta_q^5 + \beta_q^6)/4 \quad \gamma_G^6 = (Fig4\ \gamma_q^6 + Fig5\ \gamma_q^6 + Fig6\ \gamma_q^6)/3$

3.3 Particle force masses

The particle force is the average value of the standard neutrino n and the oscillating gravino G. Therefore, the masses of weak particle force, electromagnetic particle force, and strong particle force are each 0.01582 eV, 828.0 eV, and 42.15 keV. Since all forces are described based on strong force, subtracting 4.625 from the logarithmic values, they are each -6.426, -1.707, and 0.000.

3.4 Physical force strength

In physics, when the strength of strong force is 1, that of electromagnetic force 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 1E-6.

3.5 Weak dark force = Dark energy

In the electromagnetic force of Table 1, the particle force is -1.707, but the physical force is -2.137 (= log 1/137.036). There was a logarithmic difference of ξ_w 0.4301, which is the weak dark force or dark energy. The normal value is $10^{0.4301}$ or 2.692. This value is similar to 2.215 to 3.000, which is the ratio of 68% ~ 75% of dark energy and 32% ~ 25% of the rest of matter. Dark energy makes everything of our universe into kinetic state[4]. Here, it is judged that our space is not in an accelerated expansion, that is, an accelerated kinetic state. Dark matter is a supermassive black hole and makes everything of galaxy into kinetic state.

3.6 Weak physical force

If the ξ_w 0.4301 of weak dark force is added to the weak particle force -6.426, the logarithmic value is calculated as -5.996. Its value is 1.0104E-6. This will be the value of weak physical force.

3.7 Absolute dominant object

Something subtracts the logarithmic value 0.4301 from electromagnetic particle force and adds it to weak particle 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.

4. Gravitational force and Dark forces

4.1 Empty gravity toward 4D empty space

Our space is 6.00108D[3], not 6D. The physical values of strong force, electromagnetic force, and weak force are shown in Fig. 7. Applying logarithmic parabolic equation to the logarithmic values, the value of 0D is calculated as 2.175E-39. Multiplying that value by the weak dark force 2.692, it is calculated as 5.856E-39.

In Fig. 7, 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 5.856E-39. In previous study[3], it was calculated that our universe is similar to the shape of hydrogen. Something has made our 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.

4.2 Brane gravity

In Fig. 8, 4D, 5D, and 6D are quantum spaces compressed to the limit. 1D is a brane that spreads as a straight line on our spherical universe. Particles are produced from universal brane[2]. Therefore, the particles in Table 1 are the same as brane. The brane's strength is 2.211E-39. The dark weak force of 2.692 acts to the brane, so its value becomes 5.952E-39.

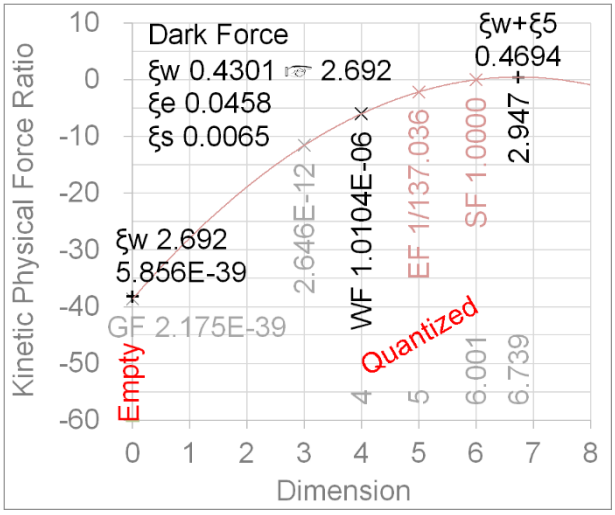

Fig. 7 Physical forces for kinetic state

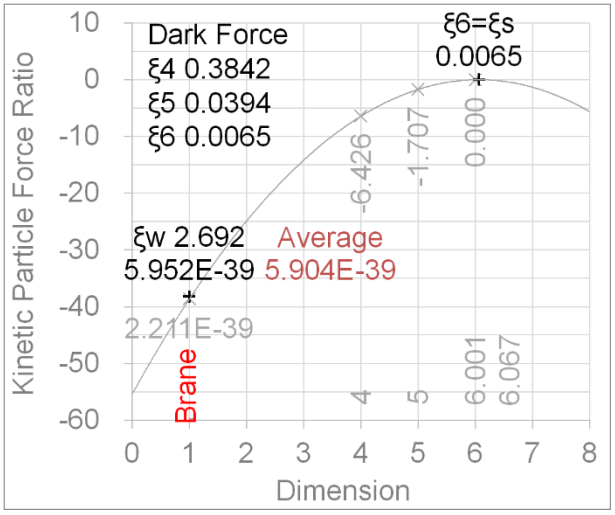

Fig. 8 Particle forces for kinetic state

4.3 Physical gravity

The empty gravity of 5.856E-39 is that an object tries to fall into the empty space, and the brane gravity of 5.952E-39 is that the brane holds on the object for it cannot fall. Brane gravity is slightly larger than empty gravity. This causes all objects in universe to float in space.

Its average value is calculated as 5.904E-39. In physics, the value of gravity is 5.906E-39. The two values can be said to be identical exactly. The measured masses of muon and tau neutrinos were presented as 170 keV and 15.5 MeV. Given 4 significant digits, the above two numbers will match exactly. From this, it is proved that the kinetic state is correct for the analysis of four fundamental forces.

4.4 Dimensional dark forces

In Fig. 8, the vertex is logarithmically as high as 0.0065. This is 6D dark force ξ_6. In Fig. 7, the vertex is logarithmically as high as 0.4694. Subtracting the weak dark force ξ_w 0.4301 from the 0.4694, the value is 0.0394. This is the 5D dark force ξ_5. Therefore, subtracting ξ_5 0.0394 and ξ_6 0.0065 from weak dark force ξ_w 0.4301, 4D dark force ξ_4 is calculated as 0.3842. Three generation quantum hole[2] occurs the three generation dark forces.

4.5 Particle dark forces

In Fig. 1, graviton α_G^{456} receives ξ_4 0.3842 on 4D, ξ_5 0.0394 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 0.0394 on 5D and ξ_6 0.0065 on 6D. Therefore, the electromagnetic dark force ξ_e is 0.0458. Gluon γ_G^6 receives ξ_6 0.0065 on 6D. Therefore, the strong dark force ξ_s is 0.0065.

4.6 Mass of light

Photon is a particle that exist in 5D quantum space, and light is a wave in empty space 0D or line space 1D.

In Table 1, the logarithmic values of graviton, photon, and gluon are each -2.787, 0.606, and 2.059, and their masses are each 1.633E-3 eV, 4.033 eV, and 114.6 eV. Such as Fig. 7, Applying logarithmic parabolic equation to the above value, the value of 0D is calculated as 1.795E-36 eV. Multiplying the weak dark force 2.692, the mass of light will be 4.831E-36 eV. If light is a 1D wave line such as Fig. 8, the values of 1D are each 2.526E-25 eV and 6.800E-25 eV.

5. Conclusions

The four fundamental forces are the particles composed of standard neutrino and oscillating gravino. From this, the weak physical force and gravitational physical force were calculated as 1.0104E-6 and 5.904E-39.

The difference between particle force and physical force is dark force. Weak dark force 0.4301, electromagnetic dark force 0.0458, and strong dark force 0.0065 are acting everywhere in our universe. Dark energy is the weak dark force.

The light mass is estimated to be 4.831E-36 eV or 6.800E-25 eV. Everything must be calculated logarithmically. And the particle force and dark force are applied to the calculation of proton mass.

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