Calculation of Dark Energy and Dark Matter by Q-theory

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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 about 13.77 billion light years. Substituting this into Schwarzschild formula, the ratio of dark matter and ordinary matter is calculated as 84.6%: 15.4%. 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 previous study, when the masses of muon and tau neutrinos are 170.0 keV and 15.50 MeV, the ratio of dark energy and dark matter was calculated as 2.692. Therefore, their ratio is 69.5%: 25.8%: 4.7%. Substituting 169.95 keV or 15.505 MeV, the calculated values are consistent almost with the values 68.3%: 26.8%: 4.9% measured from Planck satellite.

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 were calculated[4], the mass of up quark was calculated [5], four fundamental forces were unified by logarithmic parabolic equation[6], the masses of proton and neutron were calculated[7], the masses of up, charm, down, and strange quarks were calculated[8], the cosmological constant problem was solved and the six generation Planck units were calculated[9], and the masses of stellar black hole, intermediate-mass black hoke, and supermassive black hole were calculated[10].

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

2. Dark matter

2.1 Mass of ordinary matter inside of universe

The mass of ordinary matter in our universe is generally known as 1E53 kg.

2.2 Matter and Anti-matter

Planck constant h is 2π times Dirac constant h'. 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[5] is 2π times heavier than matter N.

2.3 Mass of 4D black hole of our universe.

Currently, the radius of our universe is known to be about 13.77 billion light years. Converting this to length m, the radius is 13.77E9 · 2.998E8 m/s · 60 s · 60 min · 24 h · 365.24 day = 1.303E26 m.

Schwarzschild radius of Eq. (1) is the limit of the radius of an object to become a black hole matter.

$$r_s = 2 \cdot G \cdot m \,/\, c^2 \qquad (1)$$

1.303E26 = 2 · 6.67408E-11 · m / 2.998E8^2

From Eq. (1), The m of 4D black hole matter is calculated as 8.771E52 kg.

2.4 Mass of dark matter

Above is the mass of matter. Multiplying this value by 2π, the mass of anti-matter is calculated as 5.511E53 kg. The ratio of 5.51E53 kg and 1E53 kg is 84.6%: 15.4%.

From Planck satellite, the ratio of dark energy, dark matter, and ordinary matter was observed as 68.3%: 26.8%: 4.9%. The ratio of dark matter 26.8% and ordinary matter 4.9% is 84.5%: 15.5%. Considering the observational error, the above two values can be judged to be the same. This means that our universe is on a 4D anti-black hole.

2.5 Mommy Quantum Hole (MQH)

Author calls the 4D anti-black hole Mommy Quantum Hole. It is an anti-matter body composed of muon anti-neutrinos β_s and tau anti-neutrinos γ_s.

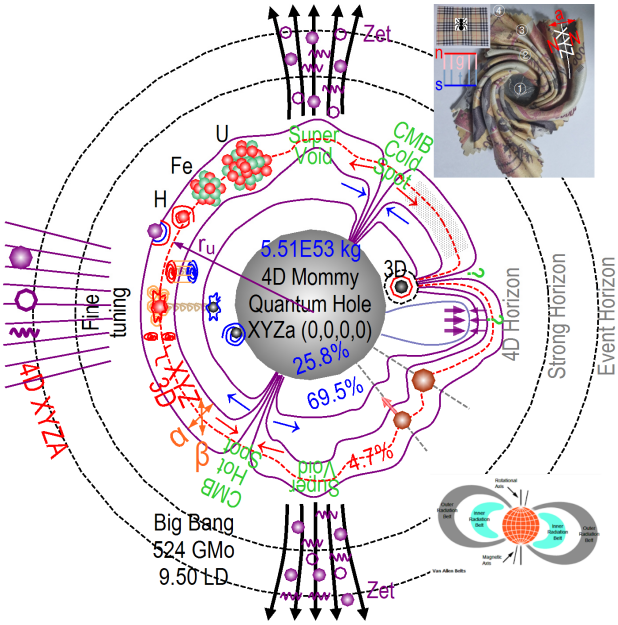


Fig. 1 Shape of our universe

There is a 4D galaxy in 4D universe. At its center, there is a 4D supermassive black hole which is shown in Fig. 1. 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.

2.6 Radius of universe

In Fig. 1, the radius of our universe is the distance from the center of MQH to the 4D horizon. The radius of 13.77 light-years in Eq. (1) is the length of the 4D horizon. Also, Eq. (1) is applied to event horizon. That is, a new formula that can

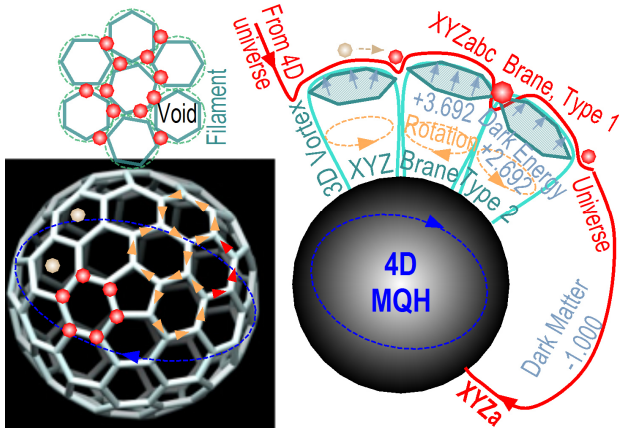


Fig. 2 Shape of dark energy and dark matter

analyze the 4D radius and 4D mass in Fig. 1 must be found.

2.7 Dark matter in galaxy

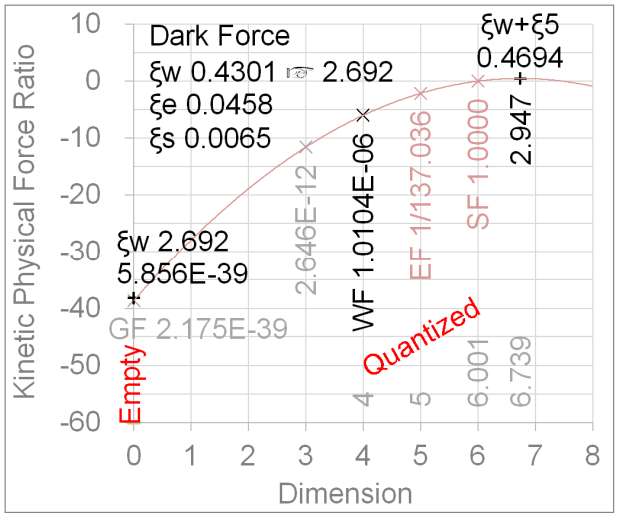
The MQH in Fig. 1 is the dark matter of the entire universe that dominates the entire universe. Dark matter in galaxy is a supermassive black hole. It dominates the galaxy and is an anti-matter composed of electron antineutrinos α_s, muon anti-neutrinos β_s, and tau anti-neutrinos γ_s. The process by which supermassive black hole dominates the galaxy is described in previous study[10].

3. Dark energy

3.1 Three generation dark forces

In previous study[6], the logarithmic values of three generation dark forces in Fig. 3 were calculated as 0.3842, 0.0394, 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.

3.2 Shape of dark energy and dark matter



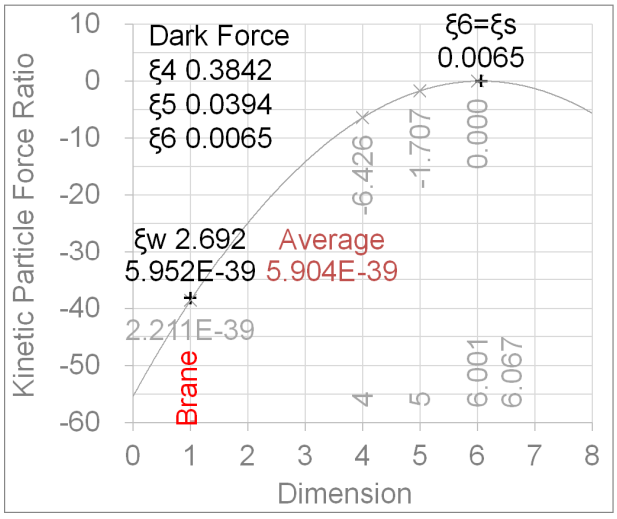


Fig. 3 Four fundamental forces and three generation dark forces at 6.00108D

Table 1 Sensitivity analysis of dark energy according to the change of muon and tau neutrinos at 6.00108D.

Muon			Tau = 15.50 MeV					Tau			Muon = 170.0 keV				
keV	ν_0/ν_3	-121.539	ξ_ν	ξ_G	G_0	G_1	G	MeV	ν_0/ν_3	-121.539	ξ_N	ξ_G	G_0	G_1	G
169.5	-121.203	0.336	2.169	2.690	5.840E-39	5.805E-39	5.822E-39	15.45	-121.037	0.502	3.177	2.694	5.874E-39	6.117E-39	5.995E-39
169.6	-121.187	0.352	2.249	2.690	5.843E-39	5.834E-39	5.838E-39	15.46	-121.055	0.485	3.052	2.694	5.871E-39	6.084E-39	5.976E-39
169.7	-121.172	0.368	2.333	2.691	5.846E-39	5.863E-39	5.855E-39	15.47	-121.072	0.467	2.933	2.693	5.867E-39	6.051E-39	5.958E-39
169.8	-121.156	0.384	2.419	2.691	5.850E-39	5.892E-39	5.871E-39	15.48	-121.089	0.450	2.818	2.693	5.863E-39	6.017E-39	5.940E-39
169.9	-121.140	0.399	2.509	2.692	5.853E-39	5.922E-39	5.887E-39	15.49	-121.107	0.433	2.708	2.692	5.860E-39	5.984E-39	5.922E-39
170.0	-121.124	0.415	2.602	2.692	5.856E-39	5.952E-39	5.904E-39	15.50	-121.124	0.415	2.602	2.692	5.856E-39	5.952E-39	5.904E-39
170.1	-121.108	0.431	2.698	2.692	5.859E-39	5.982E-39	5.920E-39	15.51	-121.141	0.398	2.500	2.691	5.853E-39	5.919E-39	5.886E-39
170.2	-121.093	0.447	2.798	2.693	5.863E-39	6.012E-39	5.937E-39	15.52	-121.159	0.381	2.402	2.691	5.849E-39	5.887E-39	5.868E-39
170.3	-121.077	0.463	2.901	2.693	5.866E-39	6.042E-39	5.953E-39	15.53	-121.176	0.363	2.309	2.691	5.845E-39	5.855E-39	5.850E-39
170.4	-121.061	0.478	3.008	2.693	5.869E-39	6.072E-39	5.970E-39	15.54	-121.193	0.346	2.219	2.690	5.842E-39	5.823E-39	5.832E-39
Muon			Tau = 15.45 MeV					Muon			Tau = 15.54 MeV				
169.5	-121.116	0.423	2.648	2.692	5.858E-39	5.966E-39	5.912E-39	169.5	-121.272	0.267	1.849	2.688	5.825E-39	5.679E-39	5.752E-39
170.0	-121.037	0.502	3.177	2.694	5.874E-39	6.117E-39	5.995E-39	170.0	-121.193	0.346	2.219	2.690	5.842E-39	5.823E-39	5.832E-39
170.4	-120.974	0.565	3.673	2.696	5.887E-39	6.241E-39	6.062E-39	170.4	-121.130	0.409	2.565	2.692	5.855E-39	5.940E-39	5.897E-39

Dark energy is force, not mass. The 4D quantum hole in Fig. 1 continuously absorbs our universe space as shown in Fig. 2 by rotating the A-axis, and it contracts the space of universe by -1.000 force. XYZ brane is emitted from the surface of quantum hole, and it expands the space of universe by +3.692 force. Therefore, the space of universe expands by the sum +2.692 force of the two. This is dark energy.

4D quantum hole absorbs continuously the space of 4D universe. As the result, even if our space of 3D universe expands, the brane of our space remains stable forever.

3.3 Dark energy : Dark matter : Ordinary matter

Dark energy is force. However, the mass of dark energy that expands our universe can be said to be 2.692 times the mass of dark matter that contracts our universe.

From Planck satellite, the ratio of dark energy, dark matter, and ordinary matter was observed as 68.3%: 26.8%: 4.9%. Therefore, the ratio of dark energy and dark matter is 2.549. The calculated 2.692 and the measured 2.549 are similar values. The calculated 2.692 will be correct. The ratio of dark energy, dark matter, and ordinary matter is 2.692: 84.6%: 15.4% = 69.5%: 25.8%: 4.7%.

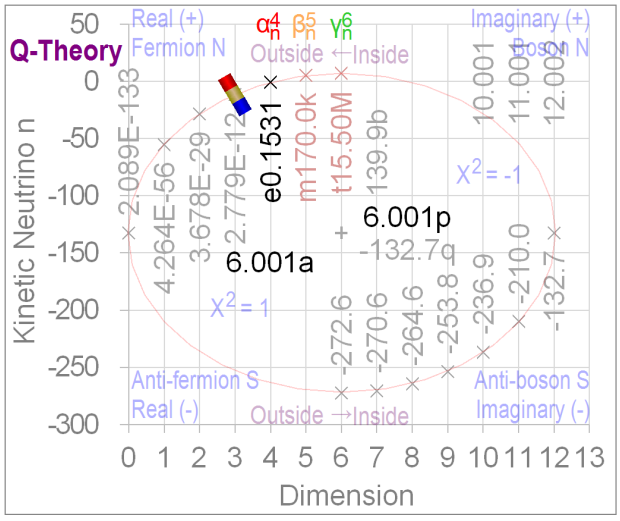


Fig. 4 Six generation neutrino masses at 6.00108D

3.4 Six generation neutrino masses

Planck length 1.61623E-25 squared times cosmological constant of 1.10565E-52 observed by Planck satellite is 2.888E-122, and the logarithmic value is -121.539.

In previous study[4], the six generation neutrino masses in Fig. 4 were calculated. Here, the muon neutrino 170.0 keV and the tau neutrino 15.50 MeV were applied as the input values in Fig. 3 and 4. All other values were calculated by Q-theory. The ν_0 2.089E-133 in 0D divided by ν_3 2.779E-12 in 3D is -121.124 as logarithmic value. The difference between -121.124 and -121.539 is 0.415, and the arithmetic value is ξ_ν 2.602. These values are presented in Table 1. The calculated 2.602 and the measured 2.549 are similar.

3.5 Four fundamental forces

From the calculation of gravitational coupling constant in physics, the strength of gravity is calculated as 5.906E-39.

When muon and tau neutrinos are 170.0 keV and 15.50 MeV, dark energy is calculated as ξ_G 2.692 from the analysis of four fundamental forces in Fig. 3[6]. From this, the 0D particle gravity G_0 is calculated as 5.856E-39 and the 1D brane gravity G_1 is 5.952E-39, and the average G is 5.904E-39. The 5.904E-39 and the 5.906E-39 can be said to be the

Table 2 Sensitivity analysis of dark energy according to the change of muon and tau neutrinos at 6D.

Muon			Tau = 15.50 MeV					Tau			Muon = 170.0 keV				
keV	ν_0/ν_3	-121.539	ξ_ν	ξ_G	G_0	G_1	G	MeV	ν_0/ν_3	-121.539	ξ_N	ξ_G	G_0	G_1	G
169.5	-121.431	0.109	1.284	2.690	7.803E-39	5.451E-39	6.522E-39	15.45	-121.265	0.275	1.882	2.694	7.850E-39	5.745E-39	6.716E-39
169.6	-121.415	0.124	1.332	2.690	7.808E-39	5.479E-39	6.540E-39	15.46	-121.282	0.257	1.808	2.694	7.845E-39	5.714E-39	6.695E-39
169.7	-121.399	0.140	1.381	2.691	7.812E-39	5.506E-39	6.559E-39	15.47	-121.299	0.240	1.737	2.693	7.840E-39	5.683E-39	6.675E-39
169.8	-121.383	0.156	1.433	2.691	7.817E-39	5.534E-39	6.577E-39	15.48	-121.317	0.223	1.669	2.693	7.835E-39	5.651E-39	6.654E-39
169.9	-121.367	0.172	1.486	2.691	7.821E-39	5.562E-39	6.595E-39	15.49	-121.334	0.205	1.604	2.692	7.830E-39	5.620E-39	6.634E-39
170.0	-121.352	0.188	1.541	2.692	7.825E-39	5.590E-39	6.614E-39	15.50	-121.352	0.188	1.541	2.692	7.825E-39	5.590E-39	6.614E-39
170.1	-121.336	0.204	1.598	2.692	7.830E-39	5.618E-39	6.632E-39	15.51	-121.369	0.170	1.481	2.691	7.821E-39	5.559E-39	6.593E-39
170.2	-121.320	0.219	1.657	2.693	7.834E-39	5.646E-39	6.651E-39	15.52	-121.386	0.153	1.423	2.691	7.816E-39	5.529E-39	6.573E-39
170.3	-121.304	0.235	1.719	2.693	7.839E-39	5.674E-39	6.669E-39	15.53	-121.404	0.136	1.367	2.691	7.811E-39	5.498E-39	6.553E-39
170.4	-121.288	0.251	1.782	2.693	7.843E-39	5.703E-39	6.688E-39	170.4	-121.421	0.119	1.314	2.690	7.806E-39	5.468E-39	6.533E-39

same value.

Here, the dark energy ξ_ν from neutrino mass in Fig. 4 was calculated as 2.602, and the dark energy ξ_G from force analysis in Fig. 3 was calculated as 2.692. There is a question of which of the two above is the correct answer.

3.6 Sensitivity analysis

The minimum masses of muon and tau neutrinos were measured as 170 keV and 15.5 MeV. When muon and tau masses range from 169.5 to 170.4 keV and 15.45 to 15.54 MeV, the dark energy values are calculated in Table 1.

The ξ_ν values have large deviation. This is because even if the values of muon on 5D and tau on 6D change slightly, the 0D value for dark energy calculation is largely changed in Fig. 4. The ξ_G values do not almost change from 2.692. This is because 4D value is applied to the calculation of dark energy from 5D and 6D values in Fig. 3.

3.7 Four significant digits of neutrino mass

The correct answer for G value is 5.906E-39. Therefore, the ξ_G 2.692 in Table 1 is the correct answer. When muon mass is 170.1 keV or tau mass is 15.49 MeV, the ξ_ν 2.698 or 2.708 satisfies 2.692. However, there is an error in the G 5.920E-39 or 5.922E-39. Above is the measurement error level. That is, 68.3%: 26.8%: 4.9% of Planck satellite and 69.5%: 25.8%: 4.7% of this calculation can be said to be the same value.

In Table 1, the reference value -121.539 is calculated from the cosmological constant measured from Planck satellite. There may be an error of about 2% in the measured cosmological constant value. That is, -121.546 calculated in previous study[9] may be the correct answer.

Therefore, if the following three things are found correctly, all values of physics will be accurately calculated and proven.

1) The 4th digit of muon and tau neutrinos are needed.
2) The exact masses of top and bottom quarks are needed.
3) 100% accurate cosmological constant value is needed.

3.8 6.00108D vs. 6D

In previous study[2], from the masses of electron 510.999 keV, muon 105.658 MeV, and tau 1.77686 GeV, our dimension was calculated as 6.00108D. This value was applied to Table 1, and the results are consistent with the Planck satellite measurement within the error range. 6D is applied to Table 2, and it can be seen that the difference between ξ_ν and ξ_G is large, and the G value is also different from 5.906E-39.

4. Structure of universe

4.1 2D universe

If 2D universe exists, where would it be? 2D universe cannot exist inside of general space of 3D universe. Is the inside of 3D supermassive black hole a garbage dump? Or is there a beautiful 2D universe such as Fig. 1? If judged to be the latter, our 3D universe is unfolding inside of 4D supermassive black hole in 4D universe.

4.2 Van Allen Belt

In Fig. 1, 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.

4.3 Superconductor phenomenon

Fig. 5 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. 1, the Horizons suddenly blocks everything. In (c), the magnetic force of magnet cannot pass through the superconductor. In Fig. 1, nothing can pass through the 4D Horizon. In (e), inside the superconductor is a completely different world. In Fig. 1, It is a completely different world. In (f) and (g), the object floats in 2D space. In Fig. 1, all object float in

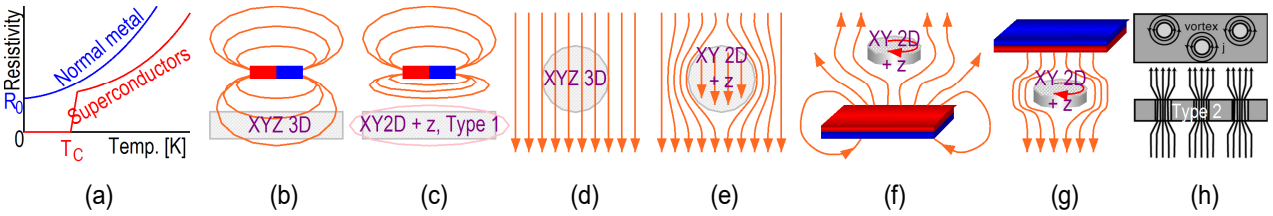


Fig. 5 Superconductor phenomenon: 2D semi-quantization in 3D space

3D space. In (h), vortexes are ejected from inside the superconductor. In Fig. 1, vortexes are ejected from inside of MQH. Superconductor and MQH are very similar in this way. However, MQH makes magnetic dipole electric monopole, but superconductors cannot do it.

4.4 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. 6. During the Big Bang, the brane of 4D universe (think a paper) was folded once, and the red space N was born[10]. About 3.7 billion years ago, the brane was folded once more due to the 3D Plank length, and the blue space S was born[9]. N is our universe, and S is the simulation universe. It is life that electron of N and anti-electron of S are connected.

4.5 Electric monopole, Magnetic dipole

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 can be located only in red space, and blue particle can be located only in blue space.

4.6 Expansion of the universe

In Fig. 1, 4D MQH grows by eating 5D Grand-Mommy Quantum Hole. Due to this, the space of universe expands. If it was a constant velocity expansion since Big Bang, it is still the constant velocity expansion now. If it was an accelerated expansion since Big Bang, it is still the accelerated expansion now. That is, constant velocity expansion and accelerated expansion do not occur by mixing. It is judged that the constant velocity expansion is correct.

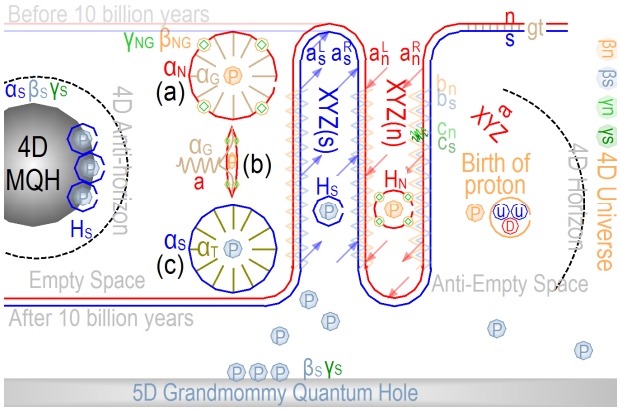


Fig. 6 Shape of space and anti-space

4.7 CMB cold spot & CMB hot spot

CMB cold spot was found. It is the magnetic field outlet of MQH in Fig. 1. There will be CBM hot spot at the exact opposite of $\pi \cdot r_u$ distance.

4.8 Circular Supervoid

Two supervoids were found. These are the 4D jets of MQH in the north and south of Fig. 1. Due to the jet, galaxies cannot exist there. They will be located exactly opposite of distance $\pi \cdot r_u$. 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.

4.9 Hexagonal Void

In Fig. 2, 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. 2 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.

4.10 Galaxy filament

Galaxies are located between the vortexes in Fig. 2. Due to this, galaxy filament structure is formed.

4.11 Velocity of galaxy

The vortexes in Fig. 2 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.

4.12 Supercluster of galaxies

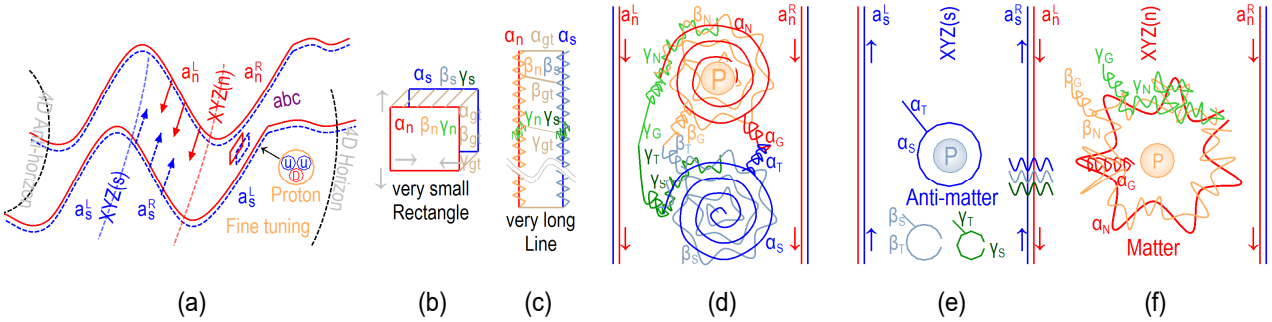


Fig. 7 Generation of hydrogen

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 of galaxies is formed.

4.13 Great wall

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

4.14 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. 2. However, after a long period of time, the galaxies eventually come down from the void and flow into another galaxy filament.

4.15 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.

4.16 Generation of hydrogen

In previous study[7], the shapes and mass calculations of proton, electron, and hydrogen were performed. Fig. 7 shows the hydrogen generation process. 4D particles in 4D universe are falling continuously toward Fig. 1. In (a), the particles are hitting the 4D Horizon brane. In (b), probabilistically, the particle cut 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, and the blue line turns into an anti-electron. 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. Hydrogen that did not exist around galaxy is generating continuously. In some cases, a large amount of hydrogens flow in at once, and a huge nebula suddenly appears.

4.17 Generation of neutron

In previous study[7], the shape and mass calculation of neutron were performed. When the hydrogen of (f) strikes the left brane $a_s^R a_n^L$ such as (a) and passes through it, a neutron is generated in (e).

5. Conclusions

Applying the cosmic radius of 13.77 billion light years to Schwarzschild formula and multiplying by 2π, the ratio of dark matter and ordinary matter is calculated as 84.6% : 15.4%. In previous study, the ratio of dark energy and dark matter was calculated as 2.692. Therefore, their ratio is 69.5%: 25.8%: 4.7%. Muon 170.0 keV and tau 15.5 MeV neutrino mass were applied to the above calculation. Dark matter of universe is MQH, dark energy is the vortexes of MQH, and dark matter of galaxy is supermassive black hole.

Substituting 169.95 keV or 15.505 MeV, the calculated values are consistent almost with the values 68.3%: 26.8%: 4.9% of Planck satellite. If exact muon and tau neutrino masses, exact top and bottom quark masses, and exact cosmological constant are given, everything will be calculated correctly.

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