Calculation of Down Strange Bottom Quark Masses by Q-theory

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May 03, 2021

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

Abstract Down, strange, and bottom quarks are the combination particles composed of the shell fermion of neutrinos and the inside boson 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. All masses can be calculated from the measured masses of top quark, bottom quark, proton, Z boson and H boson. As the result of applying Q-theory, the mass of up, charm, down, strange quark was calculated as 2.254 MeV, 1277.1 MeV, 4.767 MeV, and 95.17 MeV. From these values, the cosmological constant was calculated as 98.4% of 1.1056E-52/m2.

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], and the masses of proton and neutron were calculated[7].

The purpose of this study is to calculate the masses of up, charm, down, and strange quarks by Q-theory.

2. Shape of quarks

2.1 Quark and Anti-quark

In the previous study[5], the shapes of up, charm, and top quarks in Fig. 1 were described. These are anti-particles composed of standard anti-neutrinos, and down, strange, and bottom quarks 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

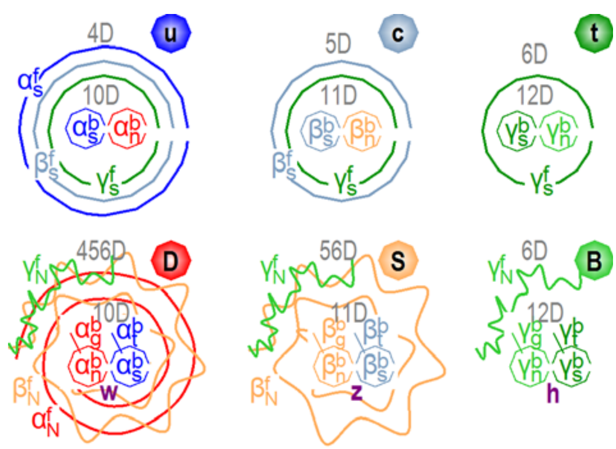

Fig. 1 Shape of quarks

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[7] on 10D, on 11D, and on 12D.

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[1], and because the quantum dimension of the most external shell is changed to 4D,

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. 1,3(a)[4]	0.1531	170.0k	15.50M	0.1384	166.0k	15.52M	eV	α_n^4	β_n^5	γ_n^6
	Fig. 1,3[4]	13.61M	13.57M	15.50M	13.62M	13.58M	15.52M	eV	α_n^6	β_n^6	γ_n^6
	Fig. 1,3[4]	187.5k	170.0k	-	183.2k	166.0k	-	eV	α_n^5	β_n^5	-
	Fig. 1,3[4]	0.1531	-	-	0.1384	-	-	eV	α_n^4	-	-
	Eq. 1)	3.864	6.192	7.190	3.846	6.188	7.191	log	α_N^{456}	β_N^{56}	γ_N^6
Shell	Eq. 2)	5.749	6.691	7.190	5.742	6.689	7.191	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. 1,3(b)[4]	293.6k	454.7k	1.598M	287.6k	446.5k	1.580M	eV	m_{n4}^{10}	m_{n4}^{11}	m_{n4}^{12}
ns	Eq. 3)	28.74k	35.77k	67.05k	28.45k	35.44k	66.67k	eV	m_{ns4}^{10}	m_{ns4}^{11}	m_{ns4}^{12}
		4.459	4.554	4.826	4.454	4.550	4.824	log	α_{ns4}^{10}	β_{ns4}^{11}	γ_{ns4}^{12}
g	Fig. 2,4(d)[4]	1.986E-09	1.502E-08	5.034E-06	2.180E-09	1.636E-08	5.362E-06	eV	m_{g6}^{10}	m_{g6}^{11}	m_{g6}^{12}
gt	Eq. 3)	2.364E-03	6.502E-03	1.190E-01	2.476E-03	6.786E-03	1.228E-01	eV	m_{gt6}^{10}	m_{gt6}^{11}	m_{gt6}^{12}
		-2.626	-2.187	-0.924	-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	1.191	1.957	log	α_{ngts}^{10}	β_{ngts}^{11}	γ_{ngts}^{12}
DARK	Fig. 8[6]	0.3842	0.0394	0.0065	0.3842	0.0394	0.0065	log	ξ_4	ξ_5	ξ_6
Super-gauge symmetry		0.0194	0.0981	0.4824	0.0194	0.0981	0.4824	log	ξ_{10}	ξ_{11}	ξ_{12}
QUARK	Sum	6.684	7.973	9.624	6.685	7.978	9.630	log	q_d	q_s	q_b
Shell + Inside + Dark		4.835M	93.94M	4.204G	4.840M	95.04M	4.264G	eV	m_d	m_s	m_b

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

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

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

4) $\xi_{10} = \xi_6 \cdot 3$ $\xi_{11} = \xi_6 \cdot 3 + \xi_5 \cdot 2$ $\xi_{12} = \xi_6 \cdot 3 + \xi_5 \cdot 2 + \xi_4 \cdot 1$

5D, and 6D, that of the boson brane also is naturally changed to 10D, 11D, and 12D.

2.4 Collapse of boson

In the previous study[1], 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[3,4], and 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 Light and Anti-light

In Fig. 1, there are no α_{gt}^b, β_{gt}^b , and γ_{gt}^b in up, charm, and top quarks. These particles are all the same, and these may be the light and anti-light in our universe and simulation universe[2]. The shell fermion particles of quark and the inside boson particles of quark are in super-gauge symmetry[2]. Therefore, the shell fermion is always in steady state, and the inside boson may be always in kinetic state moving at the speed of light. This may be why light has the speed of light.

3. Calculation of quark mass

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.

It is judged that three generation boson dark forces are acting on the boson particles. Due to this, the masses of quarks cannot be calculated. However, it is necessary to look at the flow of calculation.

Table 2 Calculation of strange quark mass in kinetic state.

Term	Reference	Logarithmic ellipse equation			Logarithmic parabolic equation			Unit	Symbol		
		Down	Strange	Bottom	Down	Strange	Bottom				
Quark	Mass	4.756M	102.6M	4.180G	4.756M	95.16M	4.180G	eV	m_d	m_s	m_b
	Shell + Inside	6.677	8.011	9.621	6.677	7.978	9.621	log	q_d	q_s	q_b
	Dimension	4D	5D	6.001D	4D	5D	6.001D				
Shell	Table 1	5.742	6.689	7.191	5.742	6.689	7.191	log	$\alpha\beta\gamma_N^{456}$	$\beta\gamma_N^{56}$	γ_N^6
	Dimension	10.001D	11.001D	12.002D	10.001D	11.001D	12.002D				
Inside	Quark – Shell	0.936	1.322	2.430	0.936	1.289	2.430	log	α_{ngts}^{10}	β_{ngts}^{11}	γ_{ngts}^{12}
		8.625	20.98	269.3	8.625	19.47	269.3	eV	w	z	h

3.2 Mass of muon and tau neutrinos

The neutrino masses of muon β_n^5 and tau γ_n^6 must be given of calculation. In Table 1, the muon mass of 170 keV and tau mass of 15.50 MeV in kinetic state are given by measurement. The muon mass of 166.0 keV and tau mass of 15.52 MeV in steady state are now assumed. These values are calculated by applying a trial & error method to the charm and top quark masses.

From logarithmic elliptic equation, the electron neutrino mass α_n^4 is calculated as 0.1531 eV and 0.1384 eV(4).

3.3 Oscillating mass of neutrino

All masses are calculated logarithmically. 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 equation 1) in Table 1.

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 equation 2) in Table 1. 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(2).

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 $m_{n4}^{10,11,12}$ and $m_{g6}^{10,11,12}$ were calculated in the previous study(4).

3.7 Inside boson mass

In the previous study(5), the mass sum of boson's particle and anti-particles was very well established by Equation 3) in Table 1. So, applying that formula, $m_{ns4}^{10,11,12}$ and $m_{gt6}^{10,11,12}$ 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 previous study(6), three generation dark forces of ξ_4, ξ_5, and ξ_6 acting toward our space from the outside of our universe was calculated. The dark forces act toward fermion's 4D, 5D, and 6D spaces, and they change into boson's 10D, 11D, and 12D spaces with super-gauge symmetry. However, since the conversion formula has not yet been identified, equation 4) in Table 1 was arbitrarily applied.

3.9 Quark mass

The logarithmic mass of quark is the sum of the shell fermion, inside boson, and dark force. Therefore, the down quark mass m_d, the up quark mass m_s, and the bottom quark mass m_b are calculated as 4.835 MeV, 93.94 MeV, and 4.204 GeV in kinetic state, and 4.840 MeV, 95.04 MeV, and 4.264 GeV in steady state. This value is similar to the value recognized in physics. However, there is no basis for Equation 4) in Table 1, and the above values cause errors in other calculations.

3.10 Error analysis

The exact value of quark mass is not yet known. Due to this, it is not possible to check whether the calculated values in Table1 are correct. There are the following problems in this calculation. 1) Dark force may not work on boson particles. 2) It may have to be calculated as an imaginary number. 3) Equation 3 in Table 1 may be wrong. 4) Boson neutrino may not exist. 5) Some choice is wrong in Table 1. 6) The values of α_g^{10}, β_g^{11}, and γ_g^{12} should be calculated directly from the measured down, strange, and bottom quark masses. 7) The shell is in steady state, and the inside is in kinetic state.

Various combinations for above calculation have been performed in this study, but the above dark force problem has not been solved yet.

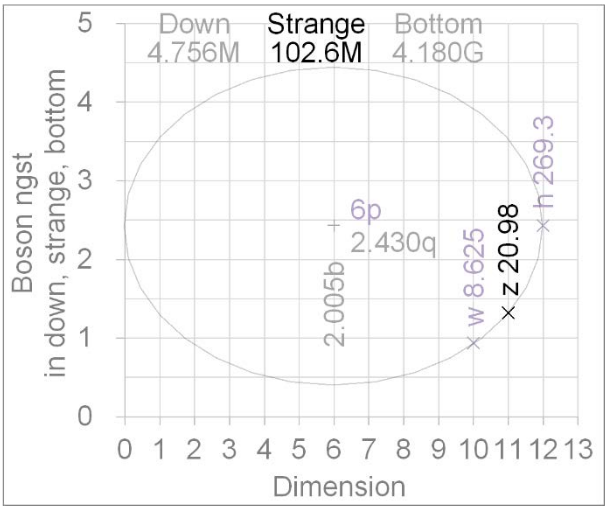

Fig. 2 Boson mass by logarithmic ellipse equation

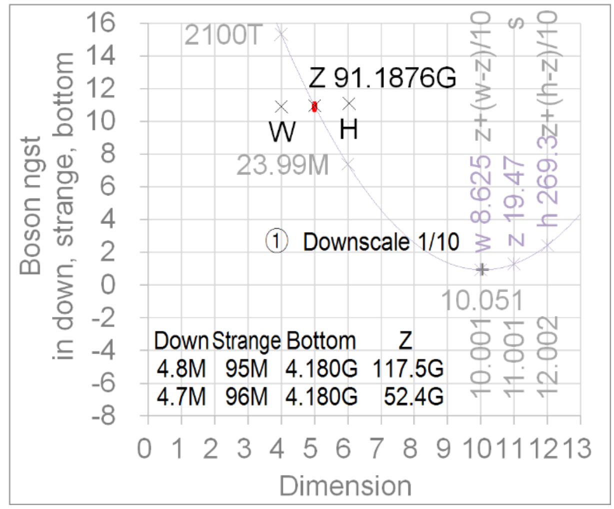

Fig. 3 Boson mass by logarithmic parabolic equation

4. Calculation of strange quark mass

4.1 Three additional conditions

Since the expected three dark energy values were not found, three other additional conditions are required.

4.2 Calculation of down quark mass form proton

In previous study(7), down quark mass was calculated as 4.756 MeV from the measured proton mass. This is the first additional condition. Here, 4.756 MeV changes slightly as input values change.

4.3 Logarithmic elliptic equation at boson

In Fig. 1, if dark energy does not affect the w, z, and h bosons, logarithmic elliptic equation must be established for the w, z, and h bosons as shown in Fig. 2.

In Table1, the down quark mass m_d is the calculated value from proton, and the bottom quark mass m_b is the measured value. Its logarithmic values are q_d and q_b. The logarithmic masses of quark shells $\alpha\beta\gamma_N^{456}$, $\beta\gamma_N^{56}$, and γ_N^{6} are given in Table 1. Thus, the inside bosons α_{ngts}^{10} and γ_{ngts}^{12} are calculated, and its masses w and h are calculated as 8.625 eV and 269.3 eV.

Since these values must satisfy logarithmic elliptic equation in Fig. 2 from the assumption that dark forces do not exist, the value of z boson is calculated as 20.98 eV. Since the sum of the shell $\beta\gamma_N^{56}$ and the inside β_{ngts}^{11} is q_s, the mass of the strange quark is calculated as 102.6 MeV.

The mass range of the recognized strange quark is about 95 ~ 96 MeV. Therefore, it is understood that the results in Fig. 2 are wrong. This means that dark forces are acting toward the bosons from the outside of our universe.

4.4 Logarithmic parabolic equation at boson

In Table 2, When the down m_d, strange m_s, and bottom m_b quark masses are given, the w, z, and h boson masses are calculated as 8.625 eV, 19.47 eV, and 269.3 eV. Applying these values to the logarithmic parabolic equation in Fig. 3, The value of 5D is calculated as 91.1876 GeV, and this is the mass of Z boson.

When down and strange masses are 4.8 MeV and 95 MeV, the value of 5D is calculated as 117.5 GeV, and at 4.7 MeV and 96 MeV, the value of 5D is calculated as 52.4 GeV. This value is very similar to the mass 91.1876 GeV of Z boson. It may be a coincidence, but this is judged to be the correct answer. If the shape of quantum space is shown mathematically, all questions of quantum mechanics will be solved.

In previous study(6), the four fundamental forces applied by dark force were calculated by logarithmic parabolic equation. The boson in quark is also a series of particle force and dark force, and the logarithmic parabolic equation in Fig. 3 is established. Therefore, the strange mass is calculated as 95.16

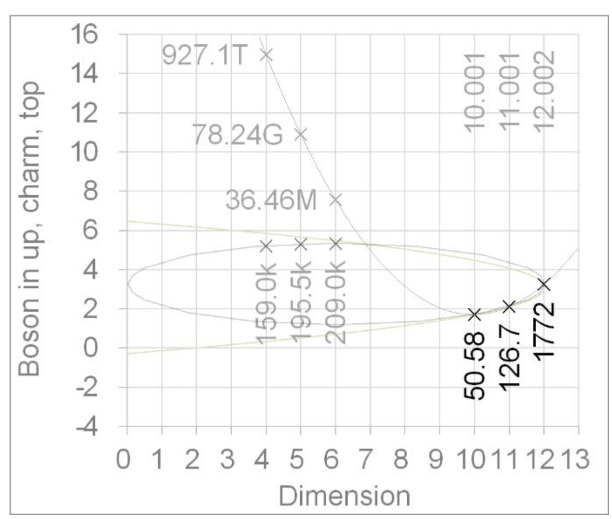

Fig. 4 Boson mass in up, charm, top quark

Table 3 Sensitivity analysis according to the change of top and charm. Where, bottom quark is 4.180 GeV.

Top	172.76 GeV					172.57 GeV					172.38 GeV				
Charm	Up	Down	Strange	Λ'/Λ	Life	Up	Down	Strange	Λ'/Λ	Life	Up	Down	Strange	Λ'/Λ	Life
MeV	MeV	MeV	MeV	%	E9Y	MeV	MeV	MeV	%	E9Y	MeV	MeV	MeV	%	E9Y
1270	2.223	4.888	96.83	79.4%	2.49	2.226	4.875	96.66	82.6%	2.71	2.229	4.861	96.48	85.8%	2.92
1271	2.227	4.870	96.61	81.7%	2.65	2.230	4.857	96.44	84.9%	2.86	2.233	4.844	96.27	88.2%	3.07
1272	2.231	4.853	96.39	84.0%	2.80	2.234	4.840	96.22	87.3%	3.01	2.237	4.827	96.05	90.7%	3.22
1273	2.235	4.836	96.17	86.4%	2.95	2.238	4.823	96.00	89.8%	3.16	2.241	4.810	95.83	93.3%	3.36
1274	2.239	4.819	95.96	88.8%	3.10	2.242	4.806	95.79	92.3%	3.31	2.245	4.793	95.62	95.9%	3.51
1275	2.243	4.802	95.74	91.3%	3.25	2.246	4.789	95.57	94.9%	3.45	2.249	4.776	95.40	98.6%	3.65
1276	2.247	4.785	95.53	93.9%	3.40	2.250	4.772	95.36	97.6%	3.59	2.253	4.759	95.19	101.4%	3.79
1277	2.251	4.768	95.31	96.5%	3.54	2.254	4.755	95.14	100.3%	3.73	2.257	4.742	94.97	104.3%	3.93
1278	2.255	4.751	95.10	99.3%	3.68	2.258	4.738	94.93	103.2%	3.87	2.261	4.725	94.76	107.2%	4.06
1279	2.259	4.734	94.89	102.1%	3.82	2.262	4.721	94.72	106.1%	4.01	2.265	4.708	94.55	110.2%	4.19
1280	2.263	4.717	94.67	104.9%	3.96	2.266	4.705	94.50	109.0%	4.14	2.269	4.692	94.34	113.3%	4.33

MeV. Here, if a condition changes, the 95.16 MeV also changes slightly.

4.5 Boson in up, charm, top quarks

In the previous study(5), the masses of boson neutrino pairs in up, charm, and top quarks in Fig. 1 were calculated as 50.58 eV, 126.7 eV, and 1772 eV in Fig. 4. If the mass change follows the logarithmic parabolic equation, the masses will be measured around 78.24 GeV in 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 will be correct.

4.6 Sensitivity analysis

In principle, given the masses of top and bottom quarks, all calculations must be performed. However, since the equation for three generation dark forces acting on boson has not yet been found, down quark mass can be calculated from proton mass, and strange quark mass can be calculated from Z boson mass. Here, the charm quark mass remains unknown value.

In Table 3, when the mass of bottom quark is 4.180 GeV, up quark, down quark, strange quark, cosmological constant, and birth time of life are calculated according to the change of top quark and charm quark mass. Here, Λ is the measured cosmological constant 1.1056E-52, and Λ' is the calculated value from the quark masses. The calculation process will be described in a future study. All of the up quark mass satisfies 2.2 ~ 2.3 MeV. Looking at the down quark mass range of 4.7 ~ 4.8 MeV and the strange quark mass range of 95 ~ 96 MeV, the cosmological constant ratio Λ'/Λ is about 98%. This means that the calculated values are about 2% different from the cosmological constant Λ.

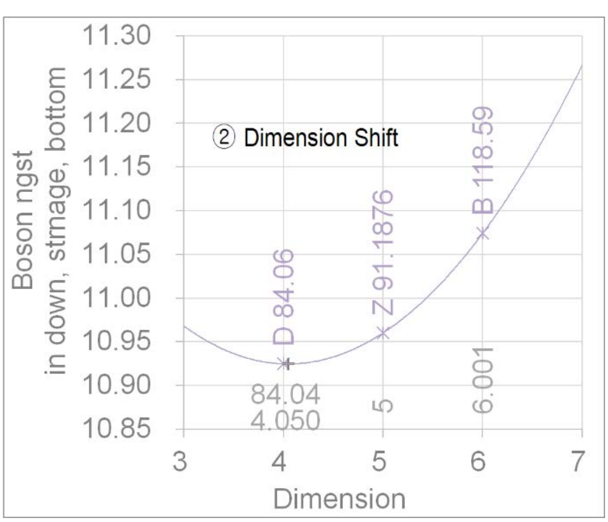

Fig. 5 Dimension shift of w, z, and h

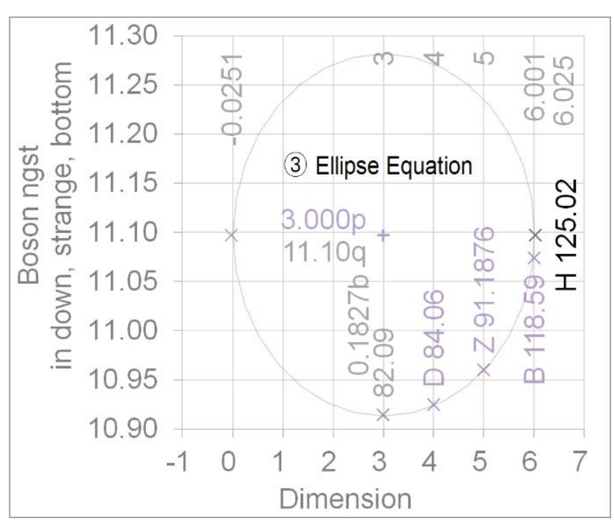

Fig. 6 Logarithmic ellipse equation of charm quark

Table 4 Sensitivity analysis according to the change of top and bottom quarks.

Top			172.76 GeV					172.57 GeV					172.38 GeV		
Bottom	Up	Charm	Down	Strange	Λ'/Λ	Up	Charm	Down	Strange	Λ'/Λ	Up	Charm	Down	Strange	Λ'/Λ
GeV	MeV	MeV	MeV	MeV	%	MeV	MeV	MeV	MeV	%	MeV	MeV	MeV	MeV	%
4.140	2.264	1280.2	4.713	94.23	105.6%	2.264	1279.3	4.715	94.25	107.2%	2.263	1278.4	4.717	94.26	108.7%
4.150	2.261	1279.6	4.724	94.46	103.8%	2.261	1278.7	4.726	94.48	105.3%	2.261	1277.8	4.727	94.50	106.8%
4.160	2.259	1278.9	4.735	94.70	102.0%	2.259	1278.0	4.736	94.71	103.5%	2.258	1277.1	4.738	94.73	104.9%
4.170	2.256	1278.3	4.745	94.93	100.2%	2.256	1277.4	4.747	94.94	101.7%	2.256	1276.5	4.749	94.96	103.1%
4.180	2.254	1277.7	4.756	95.17	98.4%	2.253	1276.8	4.758	95.18	99.9%	2.253	1275.9	4.759	95.20	101.3%
4.190	2.251	1277.1	4.767	95.40	96.7%	2.251	1276.2	4.768	95.41	98.1%	2.251	1275.3	4.770	95.43	99.6%
4.200	2.249	1276.4	4.777	95.63	95.0%	2.248	1275.5	4.779	95.64	96.4%	2.248	1274.7	4.781	95.66	97.8%
4.210	2.246	1275.8	4.788	95.86	93.4%	2.246	1274.9	4.790	95.88	94.8%	2.246	1274.0	4.791	95.89	96.1%
4.220	2.244	1275.2	4.799	96.10	91.8%	2.243	1274.3	4.800	96.11	93.1%	2.243	1273.4	4.802	96.13	94.5%

5. Calculation of charm quark mass

5.1 One additional condition

One additional condition is required to calculate the mass of charm quark. By substituting the cosmological constant Λ condition, the charm quark mass can be calculated. However, the Λ is the condition for checking how accurate the overall calculations are. Therefore, we should find another condition.

5.2 A certain idea

In Fig. 3, the logarithmic masses of bosons w, z, and h are 0.936, 1.289, and 2.430. The logarithmic value of boson Z is 10.960. Calculating with the formula in Fig. 3, The D value of Fig. 4 is 84.06 GeV and the B value is 118.59 GeV. As shown in Fig. 5, the logarithmic ellipse of the center on 3D, 84.06 on 4D, 91.1876 on 5D, and 118.59 on 6D are shown.

5.3 Charm quark mass

Change the initial charm quark mass using trial and error method. The right vertex value in Fig. 5 becomes 125.02 GeV, and the charm quark value is calculated as 1278 MeV. It cannot be explained why Fig. 5 and Fig. 6 should be established. Above is one idea. When the shape of quantum space is completely calculated by mathematical formula, all questions of quantum mechanics will be solved.

5.4 Sensitivity analysis

The masses of up, charm, down, and strange quarks according to the changes of top and bottom quark masses are shown in Table 4. The calculated up quark mass satisfies all 2.2 ~ 2.3 MeV, and its value is in the range of 2.24 ~ 2.26 MeV. The calculated charm quark mass also satisfies all 1270 ~ 1280 MeV, and when the top quark mass is 172.76 GeV, the charm quark is in the range of about 1275 ~ 1280 MeV, and in the case of 172.38 GeV, the range is 1273 ~ 1278 MeV. The calculated down quark mass also satisfies all 4.7 ~ 4.8 MeV. The strange quark mass is recognized as 95 ~ 96 MeV. Therefore, when the top quark mass is 172.76 GeV, the ratio of the calculated cosmological constant Λ' and the measured value Λ is calculated as about 93.4% ~ 100.2%, and at 172.38 GeV, it is calculated about 96.1% ~ 103.1%.

6. Conclusions

To calculate the masses of steady-state quarks, the muon and tau neutrino masses and the three generation dark forces must be given. However, the dark forces have not yet been identified. Substituting inversely top quark 172.76 GeV, bottom quark 4.180 GeV, proton 938.3 MeV, Z boson 91.1876 GeV, and H boson 125.02 GeV, all of masses can be calculated.

As the results, the masses were calculated as up quark 2.254 MeV, charm quark 1277.7 MeV, down quark 4.756 MeV, and strange quark 95.16 MeV. From the above results, the cosmological constant was calculated as 98.4% of the measured value. It can be understood that the results of these calculations are quite accurate.

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