Mass Calculation of Kaon Pion Hadrons

Deokjin Kim
EnTEs Institute, Korea. E-mail: entes@outlook.kr

March 30, 2022

Keywords: Electromagnetic force, K-meson, Quark, Strong force, π-meson

Abstract In previous study, the shapes of proton and neutron were drawn, and their masses were calculated by Q-theory. Proton of 938.3 MeV is composed of two up quarks of 2.251 MeV, one down quark of 4.760 MeV, one strong particle force of 42.78 keV and 1.0150 times dark force, and one electromagnetic particle force of 920.6 eV and 1.1116 times dark force. The strong particle force holds the two up quarks of proton. Because of this, when proton collides, the down quark falls off from proton. This is K-meson, and its mass was calculated as 495.05 MeV which is similar to the average of K± 493.67 MeV and K0 497.65 MeV. Since the structure is unstable, the strong particle force oscillates dimensionally. This is π-meson, and its mass was calculated as 137.79 MeV which is similar to the average of π0 134.98 MeV and π± 139.57 MeV. Finally, the electromagnetic particle force also becomes unstable, so π-meson collapses. In the combination of unstable particles, the strong and electromagnetic forces undergo an oscillation with varying intensities, so hadron particles have non-standard masses. In this study, various combinations of oscillating masses have been tried, but a general rule has not yet been found.

1. Introduction

In this study, the shapes of K-meson and π-meson were drawn, and their masses were calculated. The key point is that particle mass must be calculated as logarithmic values. For example, the combination of 3 eV and 4 eV in quantum space is not 7 eV but 12 eV.

2. Previous study

2.1 Quark

In Fig. 1, the shape and mass of three generation quarks are shown. The calculation algorithm is presented in Ref. 1.

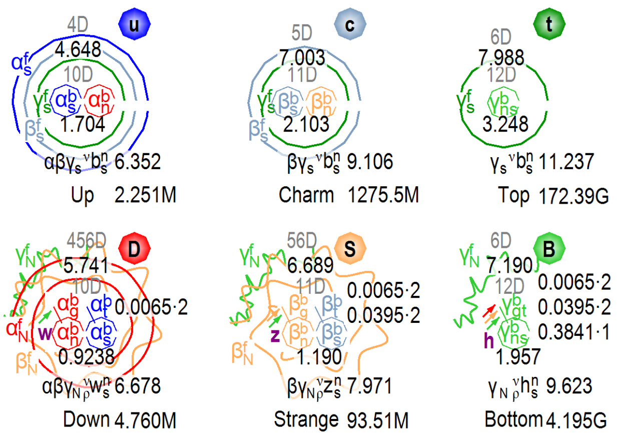


Fig. 1 Quarks [Page 33 and 42 in Ref. 1]

2.2 Particle force

In Fig. 2, the shape and mass of three generation particle forces are shown.

2.3 Dark force 72.92%

In Fig. 3, three generation dark forces are calculated. The weak dark force 2.692 of logarithmic ξ_w 0.4301 is the ratio of Dark energy to Dark matter.

2.4 Integration of four fundamental forces

In Fig. 3, from the weak dark force (= dark energy / dark matter), the four fundamental forces are integrated.

2.5 Neutrino: electron, muon, tau

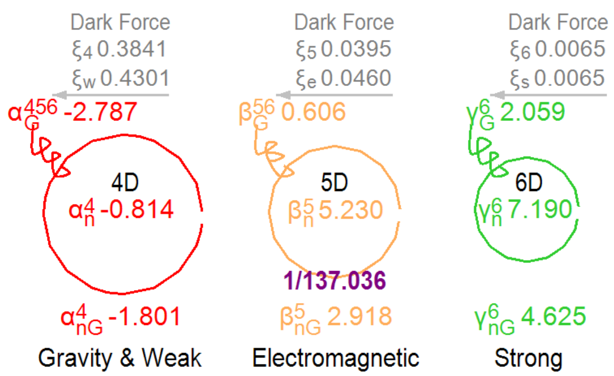
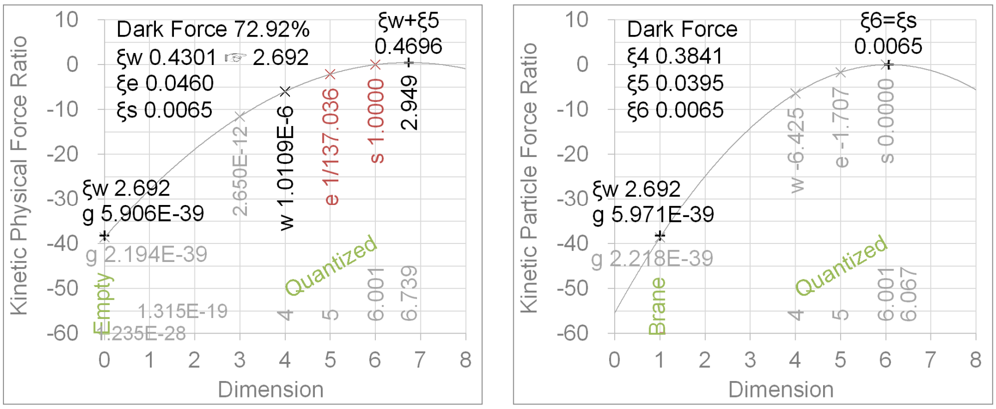


Fig. 2 Particle forces [Page 25 in Ref. 1]

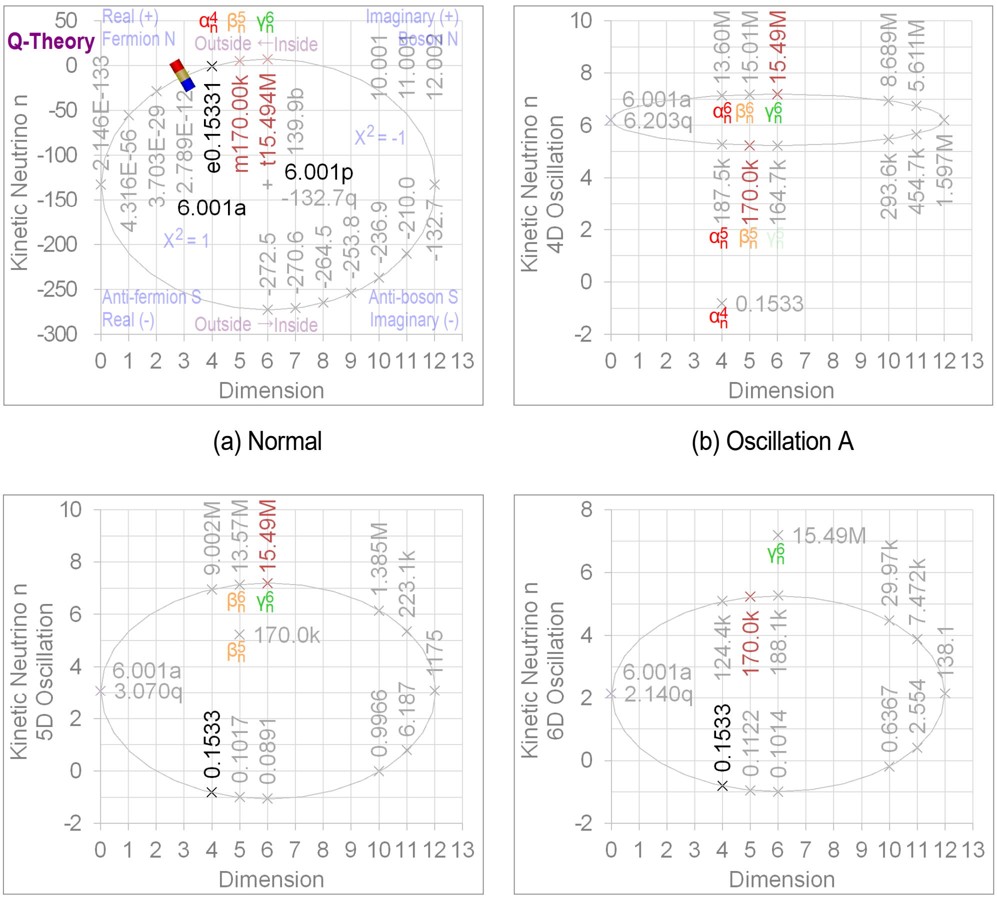


(a) Physical force (b) Particle force

Fig. 3 Integration of four fundamental forces [Page 26 in Ref. 1]

In Fig. 4, the masses of three generation of electron neutrino, muon neutrino, and tau neutrino are shown. (a) is the normal masses, and (b-d) is the oscillating masses. In (a), the normal mass of electron neutrino is calculated as 0.1533 eV. The logarithmic average of 0.1533 in (b), 0.1533 0.1017 0.0891 in (c), and 0.1533 0.1122 0.1014 in (d) is calculated as 0.1206 eV. Physics currently suggests 0.12 (0.15) eV. Both results are the same. 0.15 eV is the correct answer, and 0.12 eV is meaningless.

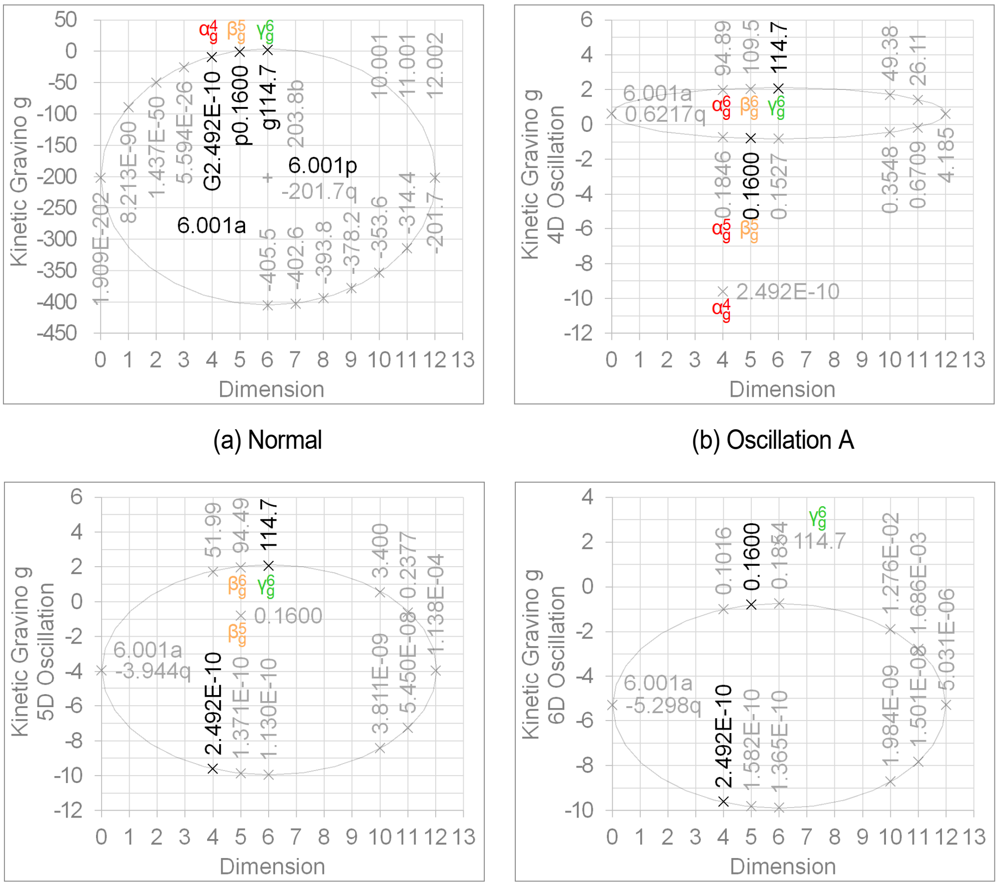
2.6 Cosmological constant problem 10^-121.54



(a) Normal (b) Oscillation A

(c) Oscillation B (d) Oscillation C

Fig. 4 Neutrino masses in kinetic state [Page 20 in Ref. 1]



(a) Normal (b) Oscillation A

(c) Oscillation B (d) Oscillation C

Fig. 5 Gravino masses in kinetic state [Page 21 in Ref. 1]

In Fig. 4(a), the value on 3D is 2.789E-12, and the value on 0D is 2.146E-133. Above ratio is 10^-121.11 and the value of cosmological constant problem is 10^-121.54. The above two values are very similar. The exact value is calculated in Page 45 of Ref. 1.

2.7 Gravino: graviton, photon, gluon

In Fig. 5, the masses of three generation of graviton, photon, and gluon are shown. (a) is the normal masses, and (b-d) is the oscillating masses.

2.8 Logarithmic values of Neutrino and Gravino

In Fig. 6, the logarithmic values of Figs. 4 and 5 are shown.

		electron	muon	tau	electron	muon	tau	electron	muon	tau	electron	muon	tau
high	6			7.1902	7.1337	7.1763	7.1902	6.9543	7.1324	7.1902			7.1902
middle	5		5.2304		5.2731	5.2304	5.2166		5.2304		5.0950	5.2304	5.2744
low	4	-0.8144			-0.8144			-0.8144	-0.9925	-1.0502	-0.8144	-0.9499	-0.9938
Neutrino		- Normal -			- Oscillation A -			- Oscillation B -			- Oscillation C -		

		graviton	photon	gluon	graviton	photon	gluon	graviton	photon	gluon	graviton	photon	gluon
high	6			2.0595	1.9772	2.0393	2.0595	1.7159	1.9754	2.0595			2.0595
middle	5		-0.7959		-0.7337	-0.7959	-0.8160		-0.7959		-0.9932	-0.7959	-0.7319
low	4	-9.6035			-9.6035			-9.6035	-9.8629	-9.9471	-9.6035	-9.8008	-9.8648
Gravino		- Normal -			- Oscillation A -			- Oscillation B -			- Oscillation C -		

Fig. 6 Logarithmic values of Figs. 4 and 5

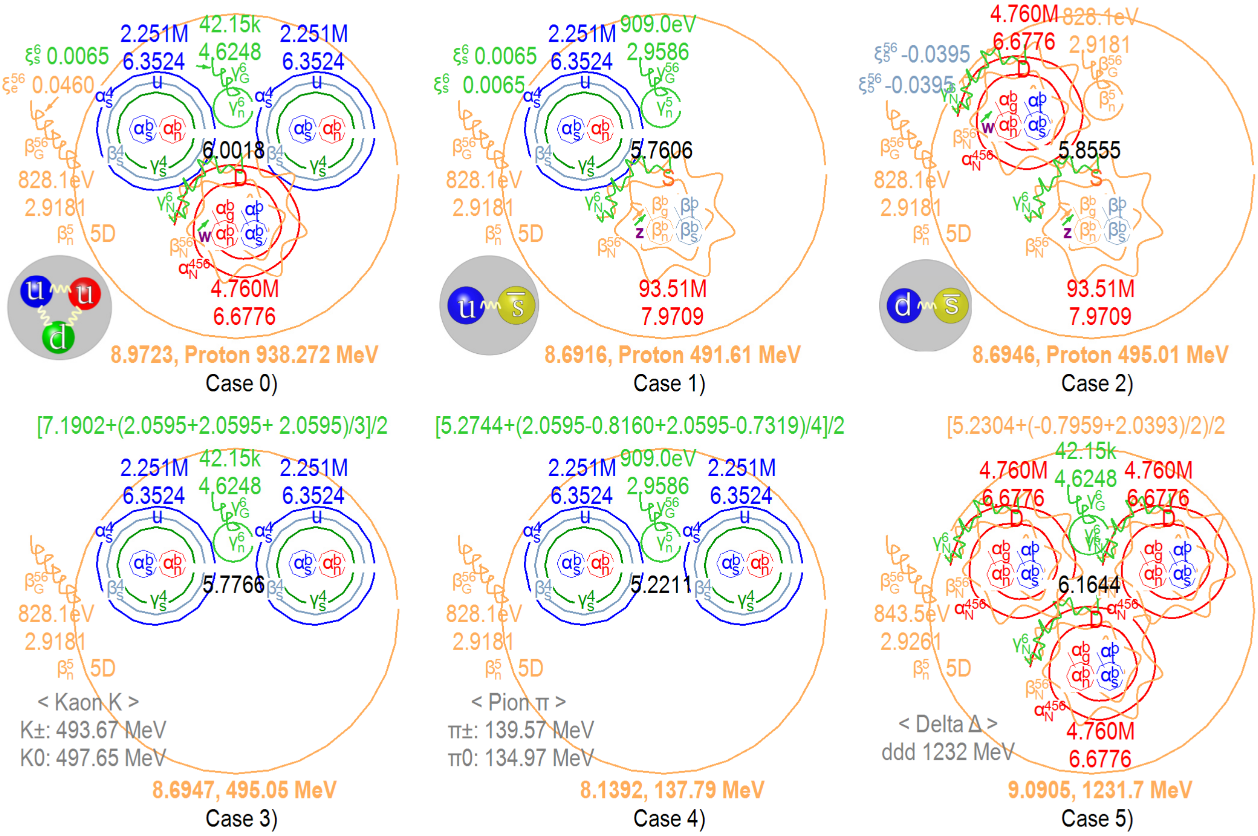


Fig. 7 Shape and mass of Kaon and Pion

3. Kaon and Pion

3.1 Case 0) Proton

The shape of proton is drawn at Case 0) of Fig. 7, and its mass is calculated at Case 0) of Table 1. The inside is composed of blue two up quarks, red one down quark, and green one strong particle force, and the average mass is calculated as 6.0018. Its dark force of 0.0065 acts on the strong particle force. Orange electromagnetic particle force of 2.9181 binds them together. Its dark force of 0.0460 acts on the electromagnetic particle force. Therefore, the summation of them is calculated as 938.27 MeV.

3.2 Case 1) Up + Strange

When the proton of Case 0) collides, it is obvious that something in proton will fall off. Let's assume that the blue one up quark and the α_n^{456} of red down quark in Case 0) are

Table 1 Mass calculation of $K^{\pm}$ 493.67, K_0 497.65, $\pi^{\pm}$ 139.57, π_0 134.98 MeV, and Δ 1232 MeV.

Term	Case 0)	Case 1)	Case 2)	Case 3)	Case 4)	Case 5)
Particle	Proton	us	ds	Kaon K	Pion π	Delta Δ
Quark 1	u 6.3524	u 6.3524	d 6.6776	u 6.3524	u 6.3524	d 6.6776
Quark 2	u 6.3524	-	-	u 6.3524	u 6.3524	d 6.6776
Quark 3	d 6.6776	s 7.9709	s 7.9709	-	-	-
Glue force	γ_{nG}^{6} 4.6248	γ_{nG}^{56} 2.9586	β_{nG}^{56} 2.9181	γ_{nG}^{6} 4.6248	γ_{nG}^{56} 2.9586	γ_{nG}^{6} 4.6248
Average	6.0018	5.7606	5.8555	5.7766	5.2211	6.1644
Glue dark force	ξ_s^6 0.0065	ξ_s^6 0.0065	$-\xi_5$ -0.0395	-	-	-
Binding force	β_{nG}^{56} 2.9181	β_{nG}^{56} 2.9181	β_{nG}^{56} 2.9181	β_{nG}^{56} 2.9181	β_{nG}^{56} 2.9181	β_{nG}^{56} 2.9261
Binding dark force	ξ_e^{56} 0.0460	ξ_s^6 0.0065	$-\xi_5$ -0.0395	-	-	-
Σ	8.9723	8.6916	8.6946	8.6947	8.1392	9.0905
eV	938.27M	491.61M	495.01M	495.05M	137.79M	1231.7M

separated such as Case 1). Then, the red down quark is changed to orange strange quark in Case 1). $K^{\pm}$ is 493.67 MeV and K_0 is 497.65 MeV. In Table 2, 491.61 MeV which is the closest to kaon mass was calculated. However, both the figure and the calculation cannot be incomprehensible.

3.3 Case 2) Down + Strange

Let's assume that the blue one up quark and α_n^{456} of red down quark in Case 0) are separated and the blue one up quark in Case 0) is changed to the red down quark such as Case 2). In Table 2, 495.01 MeV which is the closest to kaon mass was calculated. This also, both the figure and the calculation cannot be incomprehensible.

3.4 Case 3) Kaon: Up + Up 495.05 MeV

In proton of Case 0), the green (red series) strong particle force holds the two blue up quarks and pushes away the red down quark. Here, the blue up quarks and the red down quark are holding each other. Therefore, when proton collides, the red down quark having weak combination falls off from proton. If the dark forces are removed, the mass of Case 3) was calculated as 495.05 MeV. This value is similar to the average of $K^{\pm}$ 493.67 MeV and K_0 497.65 MeV.

3.5 Oscillation of strong particle force

In Fig. 6, the mass of stable strong particle force is calculated as γ_{nG}^{6} 4.6248 of (tau6 7.1902 + gluon (A6 2.0595 + B6 2.0595 + C6 2.0595) / 3) / 2.

The mass of unstable strong particle force is calculated as γ_{nG}^{56} 2.9586 of (tau C5 5.2744 + gluon (A6 2.0595 + A5 -0.8160 + C6 2.0595 + C5 -0.7319) / 4) / 2. This value is similar to the electromagnetic force of 2.9181. That is, it is understood that the unstable strong force behaves such as electromagnetic force.

3.6 Case 4) Pion: Up + Up 137.79 MeV

Since Case 3) is unstable, the strong particle force 4.6248 changes to 2.9586. The mass of Case 4) was calculated as 137.79 MeV. This value is similar to the average of π_0 134.98 MeV and $\pi^{\pm}$ 139.57 MeV.

3.7 Collapse of Pion

In Case 4), the oscillating strong particle force falls out. Therefore, it eventually collapses.

3.8 Action of dark force

Dark force acts in Case 0), but it does not act in Case 3) and 4). It can be understood that dark forces act on stable particle, not unstable particle. What is the reason?

3.9 Collision of neutron

Table 2 Generation of various particles

Hadron	Quark	MeV
Δ	uuu uud udd ddd	1232 1232 1232 1232
Λ	uds udc udb udt	1115.7 2286.5 5620.2 ?
Σ	uus uds dds	1189.4 1192.6 1197.4
Σc	uuc udc ddc	2454.0 2452.9 2453.8
Σb	uub udb ddb	5810.5 ? 5815.2
Ξ	uss dss uss dss	1314.7 1321.7 1531.8 1535.0
Ξc	usc dsc usc dsc	2467.9 2471.0 2575.7 2578.0
Ξcc	ucc dcc	3621.4 3518.9
Ξb	usb dsb dsb dsb	5792.0 5792.9 5935.0 5955.3
Ω	sss ssc ssb	1672.5 2697.5 6054.4
ρ	$u\bar{d}$	775.4 775.5
η		547.9 957.8
ηb	$b\bar{b}$	9388.9
ϕ	$s\bar{s}$	1019.5
J/ψ	$c\bar{c}$	3096.9
ω		782.7
ϒ	$b\bar{b}$	9460.3
B	$u\bar{b}$ $d\bar{b}$ $s\bar{b}$ $c\bar{b}$	5279.3 5279.7 5366.9 6274.9
D	$c\bar{d}$ $c\bar{u}$ $c\bar{s}$	1869.6 1864.8 1968.5
D*	$c\bar{d}$ $c\bar{u}$	2010.3 2007.0

In the page 38 of Ref. 1, neutron is composed of one proton, one electron, and one origin brane. When neutron collides, the origin brane is destroyed, and various neutrinos and gravinos are generated.

3.10 Correct measurement

The masses of Kaon and Pion must be measured from the collision of proton, not neutron.

3.11 Left H boson and right H boson

In the page 1 of Ref. 1, H boson mass is measured as left 123.5 GeV and right 126.5 GeV. Therefore, H boson is determined as 125 GeV of average. It is judged that this phenomenon also appears in kaon and pion.

4. Hadrons

4.1 Generation of various particles

Particles are destroyed in particle accelerator, and various particles are poured out. The various particles naturally combine to make proton. However, the particles of Table 2 are very unstable.

4.2 Case 5) Delta: ddd 1231.7 MeV

Stable electromagnetic particle force is 2.9181 of (muon5 5.2304 + photon (A5 -0.7959 + A6 2.0393 + B5 -0.7959 + B6 1.9754) / 4) / 2. In Case 5), the stable electromagnetic particle force changes to unstable 2.9261 of (muon5 5.2304 + photon (A5 -0.7959 + A6 2.0393) / 2) / 2. The mass of

Table 3 Various oscillating particle forces

Logarithmic	Equation
	< Oscillating Strong particle forces: tau + gluon >
3.6669	(C5 5.2744 + (A6 2.0595 + B6 2.0595 + C6 2.0595) / 3) / 2
2.9586	(C5 5.2744 + (A6 2.0595 + A5 -0.8160 + C6 2.0595 + C5 -0.7319) / 4) / 2
2.9480	(C5 5.2744 + (A6 2.0595 + A5 -0.8160) / 2) / 2
2.9691	(C5 5.2744 + (C6 2.0595 + C5 -0.7319) / 2) / 2
4.6248	(C6 7.1902 + (A6 2.0595 + B6 2.0595 + C6 2.0595) / 3) / 2
3.9165	(C6 7.1902 + (A6 2.0595 + A5 -0.8160 + C6 2.0595 + C5 -0.7319) / 4) / 2
3.9059	(C6 7.1902 + (A6 2.0595 + A5 -0.8160) / 2) / 2
3.9270	(C6 7.1902 + (C6 2.0595 + C5 -0.7319) / 2) / 2
4.1459	((C5 5.2744 + C6 7.1902) / 2 + (A6 2.0595 + B6 2.0595 + C6 2.0595) / 3) / 2
3.4375	((C5 5.2744 + C6 7.1902) / 2 + (A6 2.0595 + A5 -0.8160 + C6 2.0595 + C5 -0.7319) / 4) / 2
3.4270	((C5 5.2744 + C6 7.1902) / 2 + (A6 2.0595 + A5 -0.8160) / 2) / 2
3.4480	((C5 5.2744 + C6 7.1902) / 2 + (C6 2.0595 + C5 -0.7319) / 2) / 2
And so on.	
	< Oscillating electromagnetic particle forces: muon + photon >
2.2173	(B5 5.2304 + (A5 -0.7959 + B5 -0.7959 + AC95) / 3) / 2
2.9181	(B5 5.2304 + (A6 2.0393 + A5 -0.7959 + B6 1.9754 + B5 -0.7959) / 4) / 2
2.9261	(B5 5.2304 + (A6 2.0393 + A5 -0.7959) / 2) / 2
2.9101	(B5 5.2304 + (B6 1.9754 + B5 -0.7959) / 2) / 2
3.1683	(B6 7.1324 + (A5 -0.7959 + B5 -0.7959 + AC95) / 3) / 2
3.8691	(B6 7.1324 + (A6 2.0393 + A5 -0.7959 + B6 1.9754 + B5 -0.7959) / 4) / 2
3.8771	(B6 7.1324 + (A6 2.0393 + A5 -0.7959) / 2) / 2
3.8611	(B6 7.1324 + (B6 1.9754 + B5 -0.7959) / 2) / 2
2.6928	((B5 5.2304 + X89) / 2 + (A5 -0.7959+ B5 -0.7959 + AC95) / 3) / 2
3.3936	((B5 5.2304 + X89) / 2 + (A6 2.0393 + A5 -0.7959 + B6 1.9754 + B5 -0.7959) / 4) / 2
3.4016	((B5 5.2304 + X89) / 2 + (A6 2.0393 + A5 -0.7959) / 2) / 2
3.3856	((B5 5.2304 + X89) / 2 + (B6 1.9754 + B5 -0.7959) / 2) / 2
And so on.	
	< Oscillating quarks: electron + muon + tau + one of graviton, photon, and gluon >
And so on.	

delta Δ in Table 2 is 1232 MeV, and the calculated mass in Table 1 is 1231.7 MeV.

4.3 Various oscillating particle forces

The particle strong force changes in Case 4), and the electromagnetic particle force changes in Case 5). If this is correct interpretation, various oscillating values can be calculated from Fig. 6, and the expected oscillating particle forces are presented in Table 3.

4.4 Various oscillating quarks

The mass of the stable quarks in Fig. 1 is also calculated from the values in Fig. 6. It is judged that quark masses also change in unstable state. Since the calculation is complex, it was not described in this study.

4.5 Number of cases of numerous combinations

It is judged that the hadrons in Table 2 are generated from the combination of unstable quark, unstable strong force, and unstable electromagnetic force. A programming is required to find the values of Table 2 from numerous combinations. If this logic is correct, the values in Table 2 will be found.

5. Conclusions

The mass of Kaon was calculated as 495.05 MeV, and this is similar to the average of $K^{\pm}$ 493.67 MeV and K_0 497.65 MeV. The mass of Pion was calculated as 137.79 MeV, and this is similar to the average of π_0 134.98 MeV and $\pi^{\pm}$ 139.57 MeV. The mass of Delta was calculated as 1231.7 MeV, and this is equal to Δ 1232 MeV.

It is judged that there are numerous oscillating masses, and if our logic is correct, the masses of hadrons will be calculated from the number of combinations.

References

[1] D. Kim, 2021, Theory of Everything and Logarithmic Elliptic Equation, https://vixra.org/abs/2110.0023