The creation of electron

Based on the gap space theory

Shogo Niimi

shogo-ni@sk2.aitai.ne.jp

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[1]　Unit system of the expressions

(a) Electromagnetic field and the light velocity

I could not give a lot of expressions that were gotten in the <<Pair production of light velocity c with Planck's constant ħ>> the unit dimension.　Here, I will reconsider them.　Incidentally, the unit dimension system is [VAMS].

<<"The electromagnetic unit is not difficult" Imai Isao, January 2002, KAGAKU, Iwanami co.>>

The expression of light velocity is

$$v_j = \frac{c\omega_j^2 \exp(+\rho_j)\cos\delta_j}{(\sigma_j^2+\omega_j^2)} \quad [m^1s^{-1}] \quad \rho_j = \sigma_j\tau, \quad \delta_j = \omega_j\tau \qquad [1\text{-}1]$$

The relation between electric field E and magnetic field B are

$$\frac{\varepsilon_0 E^2}{2} = \frac{B^2}{2\mu_0} \qquad E\ [V^1m^{-1}], \quad B\ [A^1m^{-1}] \qquad [1\text{-}2]$$

and

$$\frac{E}{B} = \frac{1}{(\varepsilon_0\mu_0)^{1/2}} \qquad [V^1A^{-1}]$$

$$= c \qquad [m^1s^{-1}] \qquad [1\text{-}3]$$

Here, ε_0 has the dielectric constant and μ_0 has the magnetic permeability.

You should pay attention here that the unit dimension has in the relation

$$[V^1A^{-1}] \equiv [m^1s^{-1}] \qquad [1\text{-}4]$$

from [1-3].　In the above, find that the ratio of light velocity c and Planck's constant ħ is represented as follows

$$\frac{\hbar}{c} = 3.51767\times10^{-43} \qquad [V^1A^1m^{-1}s^3]\equiv[A^2s^2] \qquad [1\text{-}5]$$

It has the unit dimension of the electric charge squared.

I have any other important things.　Get

Case A	Condition	$w_j\tau = 48.87668$ $\quad \delta_j = 0.00001312066853\,\frac{\pi}{2}$ $\theta_j = 4.21671\times 10^{-7}$
	Solution	$Q_R = 3.21814\times 10^{-14}$ $\quad Q_I = 1.7487\times 10^{-13}$

set same condition with case ④ on the <<Pair production of light velocity c with Planck's constant ħ>> in the complex function

$$Q_j = \frac{Q\omega_j^2 \exp(-i\rho_j)\cos\delta_j}{(\sigma_j^2+\omega_j^2)} \qquad [1\text{-}6]$$

that is find from [1-1]. Q_R is a solution in the real space and Q_I is in the imaginary space **(Case A)**.

Absolute value $|Q_j|$ of Q_j is

$$|Q_j| = 1.77807\times 10^{-13} \qquad [1\text{-}7]$$

Here, I consider product c by ħ.

$$c\hbar = 3.16153\times 10^{-26} \qquad [V^1A^1m^1s^1]\equiv[V^2s^2] \qquad [1\text{-}8]$$

has the unit dimension of the magnetic charge (the magnetic flux) squared. The square root of cħ is

$$(c\hbar)^{1/2} = 1.77807\times 10^{-13} \qquad [V^1s^1] \qquad [1\text{-}9]$$

You pay attention to [1-7] and [1-9] are the same value. Now, Q_j may have the unit dimension of the magnetic charge. If accept here, I can give all expressions the unit dimension. I will collect expressions that are true. This is valuable work for us.

(b) Expressions

I gave many expressions of the <<Pair production of light velocity c with Planck's constant ħ>> the symbol in expedient. Here, correct them to the general symbol on the physical, as follows.

$f(\theta_j) = \pm R\omega_j \exp(\pm \rho_j) \cos\delta_j$	Elementary-function	[1−10]

$a_j = c\omega_j \exp(+\rho_j)\cos\delta_j$	$[m^1 s^{-1}]$	Acceleration
$1/C_j = \mid a_j \mid$	$[V^1 A^{-1} s^{-1}]$	C_j ; Capacity
$M_j = \hbar\,\omega_j \exp(-\rho_j)\cos\delta_j$	$[A^2 m^1]$	Moment of force
$\ddot{E}_j = \mid M_j \mid$	$[V^1 A^1 s^1]$	Energy
$V_{-j} = V\omega_j \exp(-i\rho_j)\cos\delta_j$	$[V^1]$	Electric potential
$V_{+j} = V\omega_j \exp(+i\rho_j)\cos\delta_j$		[1−11]

$v_j = \dfrac{c\omega_j^2 \exp(+\rho_j)\cos\delta_j}{(\sigma_j^2+\omega_j^2)}$	$[m^1 s^{-1}]$	(Light)Velocity
$\Omega_j = \mid v_j \mid$	$[V^1 A^{-1}]$	Resistance
$\text{Ħ}_j = \dfrac{\hbar\,\omega_j^2 \exp(-\rho_j)\cos\delta_j}{(\sigma_j^2+\omega_j^2)}$	$[V^1 A^1 s^2]$	Angular momentum Planck's constant
$\mid \text{Ħ}_j \mid$	$[A^2 m^1 s^1]$	
$Q_{-j} = \dfrac{Q\omega_j^2 \exp(-i\rho_j)\cos\delta_j}{(\sigma_j^2+\omega_j^2)}$	$[V^1 s^1] = [A^1 m^1]$	Magnetic chage(flux)
$Q_{+j} = \dfrac{Q\omega_j^2 \exp(+i\rho_j)\cos\delta_j}{(\sigma_j^2-\omega_j^2)}$		(Magnetic radius ratio) [1−12]

$r_j = \dfrac{c\,\omega_j^{3}\exp(+\rho_j)\cos\delta_j}{(\sigma_j^{2}+\omega_j^{2})^{2}}$	$[m^1]$	Length
$L_j = \lvert r_j \rvert$	$[V^1A^{-1}s^1]$	Inductance
$I_j = \dfrac{\hbar\,\omega_j^{3}\exp(-\rho_j)\cos\delta_j}{(\sigma_j^{2}+\omega_j^{2})^{2}}$	$[V^1A^1s^3]$	Moment of inertia
$\lvert I_j \rvert$	$[A^2m^1s^2]$	
$U_{-j} = \dfrac{U\,\omega_j^{3}\exp(-i\rho_j)\cos\delta_j}{(\sigma_j^{2}+\omega_j^{2})^{2}}$	$[V^1s^2] = [A^1m^1s^1]$	Electric moment
$U_{+j} = \dfrac{U\,\omega_j^{3}\exp(+i\rho_j)\cos\delta_j}{(\sigma_j^{2}-\omega_j^{2})^{2}}$		[1-13]

I am careful in the existence of singularity (in case of $\theta_j = \pi/4$) in Q_{+j} and U_{+j}.

Also, the 〈 magnetic radius ratio 〉 means ratio with magnetic moment μ_e and radius of electron r_e. I explain this detail to you later.

Moreover, I can get the high-order integration. I write them down according to need.

[2]　Electronic charge

(a) Theoretical expression of the electronic charge

Now, I got that find the expression of the electronic charge theoretically. However, there are the many forms.　$(\hbar/c)^{1/2}$ is one of form that already I got it in chapter [1].　But, my goal is to get the experiment value of the electronic charge.　Here, I will make it

$$e = 1.60217\times 10^{-19} \qquad [A^1 s^1] \qquad [2\text{-}1]$$

The expression of electronic charge q_j is represented as

$$q_j = A_j t_j \qquad [2\text{-}2]$$

in electric current A_j and time t_j.

I make electric current A_j

$$A_j = \frac{M_j}{Q_{-j}} \qquad [A^1] \qquad \begin{array}{l} M_j;\ \text{Moment of force} \\ Q_{-j};\ \text{Magnetic charge} \end{array} \qquad [2\text{-}3]$$

By the way, A_j is useless in this form.　Because I understand what "w_j" that has the infinity mathematically and does not determine physically comes out on M_j.　The detail of this expression is

$$\begin{aligned} M_j &= \hbar\,\omega_j \exp(-\rho_j)\cos\delta_j \\ &= \hbar\,w_j \sin\theta_j \exp(-w_j\tau\cos\theta_j)\cos(w_j\tau\sin\theta_j \end{aligned} \qquad [2\text{-}4]$$

$$\begin{aligned} \rho_j &= \sigma_j\tau \\ &= w_j\tau\cos\theta_j \end{aligned} \qquad \begin{aligned} \delta_j &= \omega_j\tau \\ &= w_j\tau\sin\theta_j \end{aligned}$$

However, the expression that I need is q_j.　As [2-2], I get q_j by product A_j by t_j.　Therefore, I will make

$$t_j = \tau\sin\theta_j \qquad [2\text{-}5]$$

By this expression, both of w_j and t_j that unsettled independently and have the time dimension are woven.

$$48.87668 \leqq w_j \tau \leqq 48.901915 \qquad [2\text{-}6]$$

I had already gotten this value.

Next, I reassemble expression q_j of the electronic charge. Now, can get

$$q_j = \frac{M_j \tau \sin\theta_j}{Q_j}$$

$$= \frac{[e]\, w_j \tau \exp(-\rho_j)}{\cos\rho_j - i\sin\rho_j} \qquad [e]\ ;\ \text{Symbol of the electronic charge} \qquad [2\text{-}7]$$

by expressions [2-2], [2-3]. Get [e] by the combination of ℏ with Q that are mere symbol.

By the way, we already discussed that the imaginary part does not occur in the real space, you can see [Sheet1] and [Graph2]. I consider it, the expression of the electronic charge is

$$q_j = \frac{[e]\, w_j \tau \exp(-w_j \tau \cos\theta_j)}{\cos(w_j \tau \cos\theta_j)} \qquad [2\text{-}8]$$

Then,

$$q_k = \frac{Ħ_k \tau \sin\theta_k}{U_k} \qquad [2\text{-}9]$$

is the form of the electronic charge to similar [2-8]. You must pay attention that do not lose sight of the essence of electron, however

$$q_j = \frac{w_j \tau M_j}{V_j} \qquad [2\text{-}10]$$

$$= \frac{w_j \tau Ħ_j}{Q_j} \qquad [2\text{-}11]$$

$$= \frac{w_j \tau I_j}{U_j} \qquad [2\text{-}12]$$

are same forms.

(b) Value of the electronic charge

I need microcomputer and calculation software at least to find the value of the electronic charge. I have results of many computations on another problems.

I should do now is to find the value of "$w_j \tau$" in each condition.

For example, the value of "$w_j \tau$" depends on the each case that "$\omega_j \tau$" is $\pi/4$ or $\pi/3$. The method that we search "$w_j \tau$" for

$$\frac{\text{Ħ}_j}{v_j} \equiv \frac{\hbar}{c} \qquad [2\text{-}13]$$

is formed. After that, I should substitute the value for [2-8]. In four cases, the results are as follows ([CaseA], [CaseB], [CaseC], [CaseD]).

CaseA	ConditionA	$\omega_1 \tau = 0.00001321066853\,\pi/2$	[rad^1]
		$w_1 \tau = 48.87668$	[rad^1]
		$\theta_1 = 4.21671 \times 10^{-7}$	[rad^1]
	SolutionA	$q_1 = 1.60167 \times 10^{-19}$	[$A^1 s^1$]
CaseB	ConditionB	$\omega_2 \tau = \Theta(0.955316618)$	[rad^1]
		$w_2 \tau = 48.886015$	[rad^1]
		$\theta_2 = 0.01954296$	[rad^1]
	SolutionB	$q_2 = 1.60198 \times 10^{-19}$	[$A^1 s^1$]
CaseC	ConditionC	$\omega_3 \tau = 1.23788593$	[rad^1]
		$w_3 \tau = 48.892354$	[rad^1]
		$\theta_3 = 0.02532135$	[rad^1]
	SolutionC	$q_3 = 1.60217 \times 10^{-19}$	[$A^1 s^1$]
CaseD	ConditionD	$\omega_4 \tau = 0.999999999890292\,\pi/2$	[rad^1]
		$w_4 \tau = 48.901915$	[rad^1]
		$\theta_4 = 0.032126893$	[rad^1]
	SolutionD	$q_4 = 1.60249 \times 10^{-19}$	[$A^1 s^1$]

Also, I list their details in [Sheet2].

(c) Fractional charge

I should catch real electronic charge q_j that is the scalar of vector **P** in three-dimensional space [Fig. 3]. Below, I replace **P** in [Fig. 3] with **q**.

q is

$$\mathbf{q} = (q_x , q_y , q_z) \qquad [2\text{-}14]$$

$$| \mathbf{q} | = q_j$$

$$= (q_x^2 + q_y^2 + q_z^2)^{1/2} \qquad [2\text{-}15]$$

because it is composed by three dimensional axes of x, y and z.

I can calculate only one element of [2-14]. However, this method does not get to have resolved it into each element. Actually, I can understand that the value of each element exists mathematically but it is impossible for me to take it out in mathematically and physically then consider about scalar $|\mathbf{q}|$ in expression [2-15].

It is the reason why the fractional charge does not exist in nature.

I discuss below the purpose of the comparison between existent theory and this theory.

The fractional charge of the quark is given in case of angle δ_k that has

$$\delta_k = \Theta \qquad \Theta = 0.955316618 \ [\text{rad}] \qquad k = x , y , z \qquad [2\text{-}16]$$

between vector **q** and each dimension. The baryon has the electric charge and each

$$q_k^2 = q \cos^2 \delta_k$$

$$= \frac{1}{3} \qquad [2\text{-}17]$$

is distributed three quarks respectively. In case of the expression that electronic charge q_j is

$$q_j = (q_x^2 + q^{*2}_x)^{1/2} \qquad [2\text{-}18]$$

$$q^*_x = q \sin \delta_x$$
$$= (q \cos \delta_y , q \cos \delta_z)$$
$$q^{*2}_x = \frac{2}{3}$$

it is equivalent to the electric charge distribution as the meson that is composed by two quarks. In other words, one quark has 1/3 electric charge and another one has 2/3 electric charges.

The cube is one representative that angle Θ is stable. Vector **P** has a diagonal line which on a vertex (0, 0, 0) and (1, 1, 1) as the scalar. Therefore, this vector **P** is not possible to move when the cube sides are stable. If vector **P** is the same as vector **q**, it is guaranteed that the electronic charge is stable (The proof omission).

I can describe the "quark confinement" in the reason that is the same as the process that the fractional electric charge does not exist in nature.

You refer to the <<Pair production of light velocity c with Planck's constant ħ>>.

(d) Fine-structure constant

I get

$$\beta = \frac{(\hbar / c)}{q_j^{\,2}}$$

$$= 1.37036 \times 10^{-5} \qquad \text{[dimensionless]} \qquad [2\text{-}19]$$

from [1-5]. This mean is fine-structure constant α, and get

$$\frac{1}{\alpha} = 4\pi\,\varepsilon_0\,c^2\beta$$

$$= 137.036 \qquad \text{[dimensionless]} \qquad [2\text{-}20]$$

if I accept

$$4\pi\,\varepsilon_0\,c^2 = 1 \times 10^7 \qquad \text{[dimensionless]}$$

[3]　Electronic mass

(a) Consider of existent mass expression

I know that a lot of pioneers got a lot of expressions include electronic mass m_e.　I take some expressions out from them.

①　The relation between m_e and the radius of electron

The expression that classical radius of electron r_e is as follows.

$$r_q = \frac{e^2}{m_e}$$

$$= 2.81794092 \times 10^{-8} \quad [m^1] \qquad [3\text{-}1]$$

$$r_e = \frac{r_q}{4\pi \varepsilon_0 c^2}$$

$$= 2.81794092 \times 10^{-15} \quad [m^1] \qquad [3\text{-}2]$$

②　The relation between m_e and the magnetic moment

Bohr magneton μ_b is as follows.

$$\mu_b = \frac{\hbar e}{2m_e}$$

$$= 9.2740154 \times 10^{-24} \quad [A^1 m^2] \ (= [V^1 m^1 s^1]) \qquad [3\text{-}3]$$

Experiment value μ_e of the magnetic moment is as follows.

$$\mu_e = \frac{g' \hbar e}{2m_e}$$

$$= 9.2847701 \times 10^{-24} \quad [A^1 m^2] \qquad [3\text{-}4]$$

Here, g' is gotten from the g-factor, as follows.

$$g' = \frac{g}{2}$$

$$= 1.00115965226 \qquad [3\text{-}5]$$

③ The relation between m_e and the electric current

I get

$$m_e = \frac{A_j q_j}{v_j} \qquad [3\text{-}6]$$

from [2-3]. This [3-6] is composed by velocity v_j, electric current A_j and electron q_j.

By the way, I cannot get the value of m_e use these expressions. So, they have a big problem. It is that I do not decide the value one set of $\omega\tau$, must decide the value of isolated ω or τ that are in these expressions. However, I cannot find the logical limitation which decides the value of isolated ω or τ.

The ratio of electron radius r_q and Bohr magneton μ_b is as follows.

$$\frac{\mu_b}{r_q} = \frac{\Phi_e}{2}$$

$$= 3.29106 \times 10^{-16} \qquad [V^1 s^1] \qquad [3\text{-}7]$$

$$\Phi_e = \frac{\hbar}{q_j}$$

$$= 6.58212 \times 10^{-16} \qquad [V^1 s^1] \qquad [3\text{-}8]$$

Φ_e is the physical quantity which is called the magnetic charge or the magnetic flux. Also, the 〈magnetic radius ratio〉 that was found before is this Φ_e. This one has the unit dimension which is the same as Q_j. Unfortunately, this discussion does not develop any more. However, we have the harvest that magnetic charge Φ_e has the possibility to exist as the physical substance.

Now, I replace symbol m_e with electronic mass to m_q, so electric charge q_j

has width was gotten in chapter [2].

By the way, does some hint go out of electric current A_j? Actually,

$$\frac{A_j}{c} = 5.68566 \times 10^{-12} \qquad [A^1 m^1 s^{-1}] = [V^1] \qquad [3\text{-}9]$$

$$(v_j = c)$$

is gotten as the expectation value, but it is not a logical answer because the value of ω or τ does not decided. I state that this expectation value is gotten as the ratio of the expression to enumerate by the following to the end of this section.

$$\frac{A_j}{c} = \frac{m_q}{q_j} = \frac{q_j}{r_q} = \frac{\hbar}{2\mu_b} \qquad [V^1] \qquad [3\text{-}10]$$

(b) Electronic mass

I understood that electronic mass could not be gotten from existent theory. Will seek electronic mass while search for the answer of “why does it so”.

Now, I reconsider about all value solutions that were gotten.

I am convinced that all value in addition to light velocity c, Planck’s constant ħ and electronic charge q_j that finds them out has contents. Also I believe what a lot of singularities that are expressed in the place around qj have a meaning. For example, the expression

$$Q_{+j} = \frac{Q\omega_j^2 \exp(+i\rho_j)\cos\delta_j}{(\sigma_j^2 - \omega_j^2)} \qquad [V^1 s^1] \qquad [1\text{-}12]$$

has a solution of smooth vibration but I know that it has a singularity to the point of $\theta = \pi/4$. In the near future, you can make the physical meaning of it clear.

I state that the value in this paper is all of them in the physics. Actually, I can find electronic mass m_q out under the firm conviction.

I state repeatedly that the electronic charge on this theory has the width of

$$1.60167\times10^{-19} \leqq q_j \leqq 1.60249\times10^{-19} \qquad [3\text{-}11]$$

$$\Delta q = 8.2\times10^{-23} \qquad [3\text{-}12]$$

It has cause to two kinds that

$$48.87668 \leqq w_j\,\tau \leqq 48.901915 \qquad [3\text{-}13]$$

$$\Delta w\tau = 0.025235 \qquad [3\text{-}14]$$

also

$$0 \leqq \theta_j \leqq 0.032126893 \qquad [3\text{-}15]$$

$$\Delta\theta = 0.032126893 \qquad [3\text{-}16]$$

in the fluctuation width of micro angle. The direct cause that electronic charge q_j has width is in

$$\varDelta\omega\tau = \varDelta w\tau \cdot \sin\varDelta\theta \qquad [3\text{-}17]$$

$$\simeq \varDelta w\tau \cdot \varDelta\theta \qquad [3\text{-}18]$$

which is composed by $\varDelta w\tau$ and $\varDelta\theta$. This $\varDelta\omega\tau$ is the curvature angle in the space accompanies electronic charge q_j which I pictured in [Fig. 6] or the motion of precession angle ϕ. Yes, I should say that electronic charge q_j is born by the effect that the motion of precession angle

$$\phi = \varDelta\omega\tau \qquad \text{[Fig. 11]} \qquad [3\text{-}19]$$

appears by the space has the curvature.

In this way, I can not find electronic mass m_q out by ignore the motion of precession angle ϕ. As I considered in [3]-(a), this is the biggest reason that cannot get electron mass m_e from all existent expressions.

By the way, I define $\varDelta q$ from another point before make a mass function. It will be

$$\varDelta q = \int_{j=1}^{n} A_j \ d\tau$$

$$= \max{:}q - \min{:}q \qquad [3\text{-}20]$$

from the relation between electronic charge q_j and electric current A_j.

A_j is impossible to calculation in case of [j=0] that has $\theta=0$ (reference to [Sheet2]). So, I delete the case of j=0. Case [j=1] has condition [$a \simeq 0$, $\theta < a$, $\theta \neq 0$]. So, I do not need to make fix

$$\theta = 1.77807 \times 10^{-13} \qquad [3\text{-}21]$$

on it. Case [j= n] is last one.

Let's see [Fig. 10]. Expression [3-18] is a base under the existence area of electronic charge q_j. Then, I understand that $\varDelta q$ is fluctuation range of the electronic charge in the micro fluctuation angle, i. e. the motion of precession angle ϕ.

Then, I bring in fine-structure constant β to here that the condition to get electronic mass m_q assembles.

Therefore, I get

$$m^*_q = \Delta q \cdot \beta \cdot \Delta w \tau \cdot \Delta \theta \qquad [3\text{-}22]$$

$$= 9.1100458 \times 10^{-31} \qquad [3\text{-}23]$$

from the interesting mass function.

The mass function that I can be logically satisfied is as follows.

$$m_q = \Delta q \cdot \beta \cdot \sin \Delta \omega \tau \qquad [3\text{-}24]$$

$$= 9.1084777 \times 10^{-31} \qquad [3\text{-}25]$$

Incidentally, I must make

$$\sin \Delta \omega \tau \cdot \cdot \cdot > [V^1 m^{-2} s^2]$$

to adjust the unit dimension.

The electronic mass that was gotten from the experiment is

$$m_e = 9.1093897 \times 10^{-31} \qquad [V^1 A^1 m^{-2} s^3] \qquad [3\text{-}26]$$

$$m_e \simeq m_q \simeq m^*_q$$

What is the cause of the difference of these solutions? I think that the curvature of the space has this cause, too.

Therefore, I want to pursue the curvature of the space to confirm right with mass function m_q that was gotten here.

(c) g-factor

I already describe that the image of the motion of precession has been pictured in [fig. 11] ⓐ, ⓑ and ⓒ. Let's discuss while we look this sometimes.

Moment of force M is composed by moment of inertia I with angular acceleration α, as follows.

$$M = I\alpha \qquad (I = m r^2) \qquad [3\text{-}27]$$

Magnetic moment μ is composed as follows by magnetic field H with M.

$$\mu = \frac{M}{H} \qquad [3\text{-}28]$$

By the way, we discussed that the motion of precession and mass do not exist if the space does not have curvature Φ. This mean is that the "arm" does not exist which produces M. In other words, the space does not have measurement of the length, as the result it connects with that the space itself does not exist.

As you know, get the magnetic moment of electron μ_b from the point that electronic mass is known. As for this, curvature Φ in the space does not considered. In this case, the theoretical value should

$$\mu_b = 0 \qquad (\because \ \Phi = 0) \qquad [3\text{-}29]$$

However, I dare try for the contradiction that cannot ignore the existence of the value. Then, I can understand that α in [3-27] is

$$\alpha = g' a$$

$$= a \qquad (\because \ g' = 1) \qquad [3\text{-}30]$$

After all, I need the operation that finds the g-factor

$$g' = 1.00115965226 \qquad [3\text{-}5]$$

to make μ_b coincide with μ_e.

How do I get the value that is equivalent to the g-factor from the gap space theory?

I make vector P that has the angle is the inclination axis of electron Θ on [Fig. 11] ⓐ.

$$\omega_j \tau = \Theta$$

$$= 0.955316618 \quad \text{[rad]} \qquad [3\text{-}31]$$

Then, I must make the inclination angle of P

ⓑ $\delta_a = \Theta + \phi$

ⓒ $\delta_b = \Theta - \phi$ [3-32]

on [Fig. 11] ⓑ, ⓒ that I consider the motion of precession angle ϕ. Incidentally, I get

$$\phi = 8.1058268 \times 10^{-4} \qquad [3\text{-}33]$$

from [3-19].

Here, I take the cosine ratio of P' in ⓑ, ⓒ to vector P in space ⓐ, get the ratio of ⓑ in the "opened space" and ⓒ in the "closed space".

Opend space	$g'_a = \dfrac{\cos\Theta}{\cos(\Theta+\phi)}$ $= 1.001148$	[3-34]
Closed space	$g'_b = \dfrac{\cos(\Theta-\phi)}{\cos\Theta}$ $= 1.001146$	[3-35]

By the way, the value of ratios g'_a, g'_b does not concord g'. I can estimate them. As I got solutions [3-34] and [3-35], I can understand what only compare cosine ingredient o-a, o-b of P and P' that has a curvature is insufficient. Therefore, I make o-c as the cosine ingredient of P' on dimension r_j that is dimension x_j have a curvature and work in the comparison with o-a, pictured them in [Fig. 12]. However, cannot pursue only

$$\overset{\frown}{PP'} = \phi$$

$$\frac{\phi}{\sin\phi} = 1.000000232 \qquad [3\text{-}36]$$

in my current. In this reason, I do not find the logical limitation that determines space curvature Φ.

However, I can expect that error k has

$$k = \frac{\overset{\frown}{oc}}{\overline{ob}}$$

$$= 1.000011657 \qquad (= 1.00001363\ ) \qquad [3\text{-}37]$$

from the existence of solution [3-36].

Directionality in the future

In the above, light velocity c, Planck's constant ħ, electronic charge q, electronic mass m_q and all physical quantity to have gotten from the gap space theory are found by the space which have curvature Φ.

After all, space curvature Φ is the principle of the force and invents gravitation. Yes, space curvature Φ is gravitation itself.

I do not find how much value the cosmological term of the general relativity. However, I look forward to the gap space theory do not contradict to it.

If the gap space theory is right, we have the following propositions.

① The "generalization of mass" and the "theoretical evidence with experiment value".

② "Unification of the interaction" and "Theoretical prove the force exists"

③ "Find the gravitational constant"

Already, we got the way that we should advance on discussed ①, ② in the ≪ Pair production of light velocity c with Planck's constant ħ ≫. We will be able to solve ③ in the near future.