Get the light velocity, the Planck's constant, Electron and the gravitational constant by the computation.

Shogo Niimi
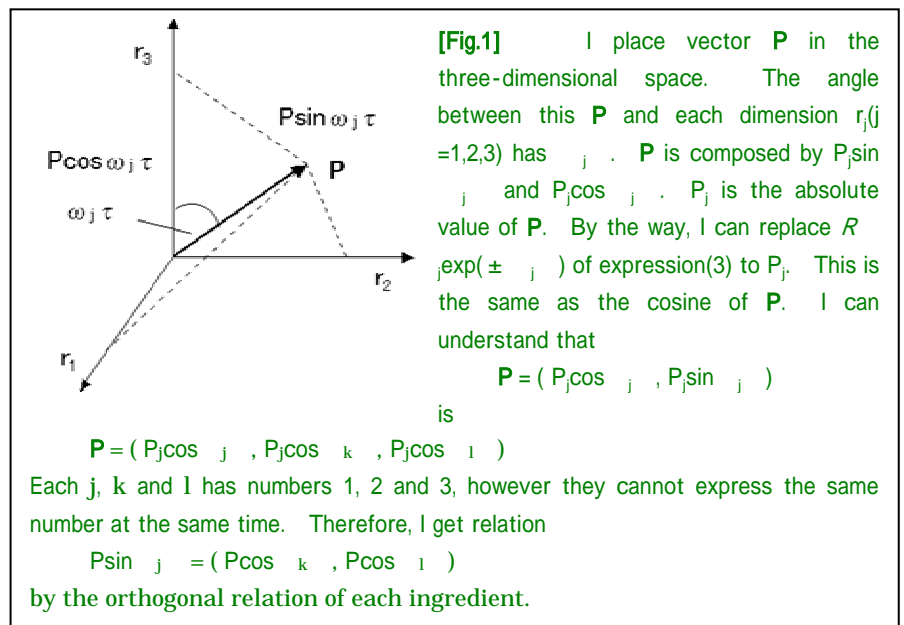
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The famous scientists make as confuse as many unification of the space and the material a goal. I think that this confusion happens by do not have the standard that evaluates them. I get the Light velocity and the Planck's constant in the identical condition on the theory. Moreover, I could get Electron based on it. Also, it links the gravitational constant. I expect that find the grand unified theory in addition to the standard by this theory if can raise this.

You will recognize that our space was born with the Big Bang. However, no one knows the necessary condition, status and so on. I do not think that the Superstring theory[1] and latest M-theory[2] which includes it are expressing the truth of the Big Bang. All theory handles light velocity c and Planck's constant $\hbar$ as axiom and cannot find them on their theory. Therefore, I need c and $\hbar$ that find them on pure theory. I want to find them out for the great development of the science. I develop original theory for the goal. Therefore, write down the procedure below.

First, I recognize the existence whole-space H that does not have a dimension. This H is incomplete stable and always likes a change. After a lot of labile change, H became H^9 that has 9 dimensions by the phase transition. It is composed by real-space R^3, complex-space G^3 and imaginary-space I^3 that have three dimensions respectively. I searched for the solution that this H^9 has. Then, I got the elementary function.

$$f(\theta_j) = \frac{R_j{}^2 \exp(\pm\theta_j)\cos\theta_j}{(\theta_j{}^2 + \omega_j{}^2)} \quad (1)$$

R is a merely symbol that does not have a meaning as the value. This function has two kinds of expression.

[Fig.1] I place vector **P** in the three-dimensional space. The angle between this **P** and each dimension r_j (j =1,2,3) has θ_j. **P** is composed by $P_j\sin\theta_j$ and $P_j\cos\theta_j$. P_j is the absolute value of **P**. By the way, I can replace $R_j\exp(\pm\theta_j)$ of expression(3) to P_j. This is the same as the cosine of **P**. I can understand that

$$P = (P_j\cos\theta_j , P_j\sin\theta_j)$$

is

$$P = (P_j\cos\theta_j , P_j\cos\theta_k , P_j\cos\theta_l)$$

Each j, k and l has numbers 1, 2 and 3, however they cannot express the same number at the same time. Therefore, I get relation

$$P\sin\theta_j = (P\cos\theta_k , P\cos\theta_l)$$

by the orthogonal relation of each ingredient.

You pay attention to the symbol that is in the exponential function. I calculate them that give both an identical condition to [+] and [-] in the numerical. I got a wonderful solution in case of [$\theta_j = w_j \sin\theta_j$, w_j = 48.87668] on there. The side of expression [+] has value 299792458[m^1s^{-1}] that is the same as c, and [-] has value 1.05457 × 10^{-34}[$V^1A^1s^2$] that is the same as $\hbar$. Then, I give the side of [+] v_j and give the side of [-] the symbol of $\hbar_j$ in expression (1). I discovered that w is the curvature radius then canvassed the elementary function. Therefore, get a result that whole-space H^9 has

the curvature. The curvature radius is determined by the value of ω. If you can believe that ω has Planck time, then the value of radius win H^9 has 9.06992× 10^{-44}[rad^1s^{-1}].

In the above, I have convinced that the electromagnetic field exists there. Here, try to the creation of electron. Therefore, I must put the elementary function into G^3. Now, I can find electric charge q_j by these expressions. This value of q_j has width from 1.60167× 10^{-19} to 1.60249× 10^{-19}. This width is equivalent to micro movement angle $\Delta\theta$ of θ_j. This $\Delta\theta$ that electron has the motion of precession angle. At

last, we discuss that need this where find electronic mass m_q, in this paper. I need this for get electronic mass m_l. Finally, we will get gravitational constant G_N after grow this theory up.

The elementary function

I referred to the oscillation circuit[3] of the electronics to get the elementary function. I have an idea that the oscillation condition is the phase transition, compare to regular vibration of the electromagnetic wave. The amplification circuit and the feedback circuit compose the oscillation circuit. At first, I replaced those circuits with R^3 and I^3. This solution oscillates in surely. However, I understand that space itself is disappeared immediately after the phase transition in case of the whole space has $H^6 = [\ R^3 | I^3\ ]$. Therefore, must add another circuit G^3 for space not to disappear. I should say it the resonance circuit. Here, write down the phase transition in whole-space H as follows.

$$H \xrightarrow{\text{phase tr}} H^9 = [\ R^3\ G^3\ I^3] \qquad (2)$$

This G^3 is the complex space that is composed by real-space R^3 and imaginary-space I^3. I call it the gap space because G^3 exists at the crack of R^3 and I^3. They are in the incomplete disintegration condition that the information can be each other exchanged. Gap space G^3 that has some information and three dimensions is like a membrane that is the thin screen which partitions R^3 and I^3. We can imagine the beautiful film of the soap bubble. I am possible to call G^3 the holographic membrane[4] by applying it to the M-theory.

I got solution k that has three dimensions from expression (2) in
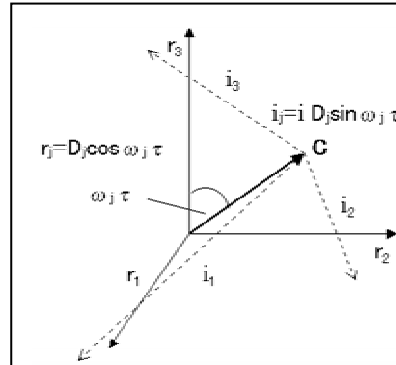
[Fig.2] I place complex vector C in complex space G^3 that is enclosed by real space R^3 and imaginary space I^3. The angle that between this C and dimensional axis r_j (j=1,2,3) has θ_j. By the way, I can replace $Q_{\omega j}^2 \cos\theta_j /(\alpha_j^2 + \beta_j^2)$ of expression (8) to D_j. I know that [exp(-iθ_j)] is [$\cos\theta_j$ -isinθ_j]. isinθ_j is getting on i_j. In this case, D_j has both of the cosine ingredient and the sine ingredient.

Therefore, I can set D_j in C, as follows.
$$C = (\ D_j \cos\theta_j\ ,\ -\ i\ D_j \sin\theta_j\ )$$
I can accept the orthogonal relation even if $\cos\theta_j$ to isinθ_j is a difference of the real ingredient to the imaginary ingredient. Also, I make C_j that is absolute value $|C|$. In the above, I get
$$C_j = (\ |D_j^2 \cos^2\theta_j\ | + |D_j^2 \sin^2\theta_j\ |\ )^{1/2}$$
In addition to it,
$$C = (\ D_j \cos\theta_j\ ,\ D_j \cos\theta_k\ ,\ D_j \cos\theta_l\ )$$
You must be careful in that $(iD_j \sin\theta_j\ ,\ iD_j \sin\theta_k\ ,\ iD_j \sin\theta_l\ )$ is the double of C and has reverse direction.
$$-2C = (\ iD_j \sin\theta_j\ ,\ iD_j \sin\theta_k\ ,\ iD_j \sin\theta_l\ )$$
As the result, I agree that it is possible to express by three dimension elements even if C has six dimension elements.

using the Laplace transform ([Fig.1]). Write down $k(\tau_j)$ that is one of ingredient of it below.

$$k(\tau_j) = R\ \alpha_j \exp(\pm\ \alpha_j\ )\ \cos\beta_j \qquad (3)$$

This $k(\tau_j)$ is a solution that exists only in R^3. I can choose any one of the numbers in j that has 1, 2, 3. The relation between α and β is $w_j = (\ \alpha_j,\ \beta_j\ )$ by the Bromwich=Wagner theorem[5]. Therefore, they have $\alpha_j = w_j \cos\theta_j$, $\beta_j = w_j \sin\theta_j$. Variables α_j, β_j, w_j, θ_j are in the subordination each other. I get elementary function $f(\tau_j)$ by integration of $k(\tau_j)$. I make the function to easy-to-understand expressions.

$$v_j = \frac{[c]\ \alpha_j^2 \exp(+\ \alpha_j\ )\cos\beta_j}{(\ \alpha_j^2 + \beta_j^2\ )}$$
$$[m^1 s^{-1}] \qquad (4)$$

$$H_j = \frac{[\hbar]\ \alpha_j^2 \exp(-\ \alpha_j\ )\cos\beta_j}{(\ \alpha_j^2 + \beta_j^2\ )}$$
$$[V^1 A^1 s^2] \qquad (5)$$

$\hbar$ is the symbol that has divided Planck's constant h by 2π.

Incidentally, on all paper[6] of mine, I use [c] and [$\hbar$] as the merely symbol which does not have value.

The light velocity with the Planck's constant

I must observe variables attentively before calculation. Specifically, can not give isolated θ value. The θ has a high degree of freedom and I do not have the logical limitation that determines the value. Therefore, I always give sets [α_j], [β_j], [w_j] value. Properly, can give τ_j value. However, must remember that these variables are in the subordination each other. In above reason, I can not calculate expression (3) except what ignores τ_j. However, can calculate (1) that is the most important elementary function. The expressions (4), (5) are same. The work that I need now is to rewrite expressions using τ_j. Will be enough, rewrite only (1). Here, I write down a solution of it.

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$$f(\theta_j) = R\sin^2\theta_j \exp(\pm w_j\tau \cos\theta_j)$$
$$\times \cos(w_j\tau \sin\theta_j) \qquad (6)$$

Just, I can calculate in having this expression. Properly, I cannot miss relation $\phi_j = w_j\tau \sin\theta_j$. For now, I do not know a range with the value that is given to all variables. Therefore, I who have no handhold and no special reason give θ_j inclination axis of electron[7] (= 0.955316618). I can give $w_j\tau$ all value which excludes zero. The value of ϕ_j has been determined by both of θ_j, $w_j\tau$. I cannot give you all my worksheets in here but give the part of the interesting result [Sheet1]. The ϕ_j in case of $\theta_j = \theta$ and $w_j\tau = 48.886015$ has 0.01954295990542. In this condition, $v_j = 3.71738\times 10^{-17}$ and $\hbar_j = 1.30765\times 10^{-25}$. Surely, you will give looks like this frivolous solution of me high evaluation by compute ratio $\hbar_j/v_j$. This ratio has 3.51767×10^{-43} that is the same as value $\hbar/c$. I have the next work on this positive result. I discovered that expression (4) and (5) has c and $\hbar$ in the following condition after a lot of value calculation.

Case (1)

Condition (1)

$w_j\tau = 48.87668$
$\theta_j = 0.00001312066853\,\pi/2$
$\phi_j = 4.21671396911943\times 10^{-7}$

Result (1)

$v_j = 299792458$
$\hbar_j = 1.05457\times 10^{-34}$

I have case (2) that is a result of writing by the word and write down another case (3) below.

Case (3)

Condition (3)

$w_j\tau = 48.901915$
$\theta_j = 0.99999999890292\,\pi/2$
$\phi_j = 0.0321268926188024$

Result (3)

$v_j = 299791839.4$

$\hbar_j = 1.05457\times 10^{-34}$

The results have a small error by the limit of my computer. If I have opportunity, want to give you all worksheets. I hope you may re-examine by your supercomputer. First, you must determine the value of $w_j\tau$ re-examine from case (1) to (3). Next, You should find θ_j. The ϕ_j is determined in the relational expression of the variables. You can get v_j and $\hbar_j$ after this operation (refer to [Sheet2]).

The creation of electron

I use [VAMS] unit system[9] in this paper. Isao Imai - The University of Tokyo - is proposing this. He takes it for the defect that mass Kg is a fundamental unit in [MKSA] unit system and the other unsatisfactory cancellation. Therefore, [Kg[1]] [V[1]A[1]m[-2]s[3]]. Seems complicated but actually, it is simple. For example, Joule J [Kg[1]m[2]s[-2]] in [MKSA] unit system has [V[1]A[1]s[1]] here.

We need elementary function Q_j that exists in gap space G^3. They

are the following two expressions.

$$Q_{+j} = \frac{[Q]\,\theta_j^2 \exp(+i\phi_j)\cos\theta_j}{(\theta_j^2 + \phi_j^2)} \qquad (7)$$

$$Q_{-j} = \frac{[Q]\,\theta_j^2 \exp(-i\phi_j)\cos\theta_j}{(\theta_j^2 + \phi_j^2)} \qquad (8)$$

Expression (7) has a singular point on $\phi_j = \pi/4$. It has a special meaning but I consider only expression (8). I give this expression (8) symbol Q_j that is vibrating.

I must give this Q_j the unit dimension. Therefore, pay attention to the relation in electric field $E[V^1m^{-1}]$ and magnetic field $B[A^1m^{-1}]$ by Maxwell[9]. We get $1/(\epsilon_0\mu_0)^{1/2}$ from ratio E/B. As you know this is the light velocity. Incidentally, ϵ_0 is the dielectric constant in the vacuum and μ_0 is the magnetic permeability. Now, I must understand that unit dimension $[m^1s^{-1}]$ with velocity v_j and unit dimension $[V^1A^{-1}]$ with ratio E/B are the same. In this result, I understand that unit dimension $[V^1A^1m^{-1}s^3]$ with ratio $\hbar/c$ is the

same as $[A^2s^2]$. Also, $[A^2s^2]$ is the same as the square of electric charge e $[A^1s^1]$. Moreover, I understand that a product c by $\hbar$ has $[V^1A^1m^1s^1]=[V^2s^2]$ is the same as the square of magnetic flux $[V^1s^1]$. $\hbar = 3.16153\times 10^{26}$ and $(c\hbar)^{1/2} = 1.77807\times 10^{13}$.

I reconsider Q_j. Give the conditions of case (1) and case (3) to Q_j. I get the following result.

Case (1)

Result (1)

$Q_R = 3.21814\times 10^{14}$

$Q_I = 1.7487\times 10^{13}$

Case (3)

Result (3)

$Q_R = 3.21814\times 10^{14}$

$Q_I = 1.7487\times 10^{13}$

Q_R has the real part and Q_I has the imaginary part of Q_j. I know that absolute value $|Q_j|$ has 1.77807×10^{13} on [Fig.2]. This value is the same as $(c\hbar)^{1/2}$. Now, I understand that Q_j has unit dimension $[V^1s^1]$ is the same as magnetic flux.

The elementary function (3) has two expressions. Clearly, I understand that the side of [+] has acceleration $a_j[m^1s^{-2}]$ and the side of [-] has moment of force $M_j[A^2m^1]$ by expressions (4) and (5). The absolute value of M_j has energy $E_j[V^1A^1s^1]$.

In the above, I collected necessary materials for grasping the electric charge. I show the symbol of the electric charge in this paper in q_j. In many expressions of the electric charge, adopt $q_j = A_jt_j$. A_j has the electric current and t_j has time. Electric current A_j is expressed in M_j/Q_j. I give that do not have the logical limitation t_j value. Actually, the reason is t_j and $_j$ cannot exist independently. In this idea, I understand that A_j, a_j, M_j and E_j do not exist in the independence. I have a lot of similar physical quantity but do not write. By the way, how about the combination t_j
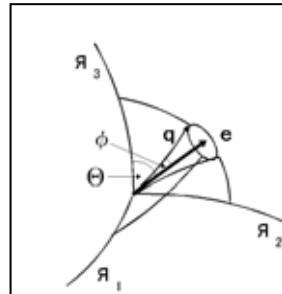
and M_j. Now, I make $t_j = \sin_j$. Then, $_j$ in M_j is $_j \sin_j$ becomes not independent. In addition, I know that Q_j has the imaginary part. This imaginary part does not appear in $\mathbf{R}^3$. In this reason, I ignore it. Finally, I get the particular expression of the electric charge by above operation.

$q_j = M_j \sin_j/Q_j$

$$= \frac{[e]w_j \exp(-w_j \cos_j)}{\cos(w_j \cos_j)} \quad (9)$$

[e] is a merely symbol of the electric charge. You refer to worksheet [Sheet2]. You can see that the electric charge has the width of 1.60167×10^{19} q_j 1.60249×10^{19}. This is a very important result. Incidentally, the expression of the electric charge is generalized as follows.

$q_j = [e]w_j \ \mathbb{H}_j/Q_j$ $\quad [A^1s^1]$ $\quad (10)$

By the way, I cannot affirm that found electron by only got the electric charge. Actually, need electronic mass. However, cannot find electronic mass from existing theory. For example, electronic mass m_e exists in the classic radius of electron $r_e = e^2/m_e$ and the magnetic moment as you say Bohr magneton[19] $\mu_b = \hbar e/2m_e$. They are not the expressions to get electronic mass originally. Therefore, I want to discuss how do we get electronic mass? As the presupposition, we must convince that the value that appeared in this

paper is not nonsense.

We know what ratio $\hbar/c$ has unit dimension $[A^2s^2]$ that the square of the electric charge. In addition, we know that electric charge e has 1.60217×10^{19} $[A^1s^1]$ in the experiment. By the way, the ratio of $\hbar/c$ and e^2 has $= 1.37036 \times 10^5$ of the dimensionless. Therefore, we can find fine structure constant $1/$ $= 137.036$ if accept 4 $_0c^2 = 1\times 10^7$. However, $1/$ is not a logical solution here now.

The result as the pre-section, the width of electric charge q has 8.2×10^{23}. Let's see cases (1), (3). We can understand that q exists in movement angle $w = 0.025235$ of w_j. Also, it exists in movement angle $= 0.032126893$ of $_j$ ([Fig.3]).

We will combine q, w and . I will give this combination the symbol of m_q^*.

$m_q^* = q$ w

$= 9.1100458\times 10^{31}$ $\quad (11)$

This solution is the same as the value with electronic mass $m_e = 9.1093897\times 10^{31}$ $[V^1A^1m^2s^3]$ approximately accidentally. We notices $= w$ $\sin$ with the previous considering. In addition it, we notice that value with is the same as w approximately.

We need the agreement that electronic mass is invented by whole space $\mathbf{H}^9$ has the curvature. Then,

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should replace with $\sin$ to express electronic mass m_t logically.

$$m_t = q \sin$$

$$= 9.1084777 \times 10^{-31} \quad (12)$$

I think that the cause of the small error of m_t and m_b is that electronic unity e has the curvature.

Here now, let's discuss about that I suppose the electron spin has the substance. We know that all physical quantities are composed on the three dimensions. On this fact, we rewrite expression (10) to $q = [e]w$ H / Q. Also, can rewrite H / Q to $(H \times Q)/Q_j^2$. H has unit dimension $[V^1 A^1 s^2]$ of the angular momentum. $H \times Q$ expresses spin. Q_j^2 is $Q \cdot Q$. The solution of $Q \cdot Q$ includes quantum number 2. As the result, we understand that spin quantum number $s = 1/2$ appears in the electric charge function[9]. Therefore, will convince that is the minimal movement angle of inclination axis of electron $j = $. By this conviction, authorize that is the motion of precession angle of electron ([Fig.4]). In case of this discussion, we must understand that electron mass is produced by the motion of precession with electron. To get above result, we must believe that spin and the motion of precession are invented by whole space H^9 has the curvature.

We can discuss the fractional electric charge of the quark. We can write q that is composed by the three dimensions as $q = (q_x, q_y, q_z)$. Suppose that $|q|$ is q_j, this is $(q_x^2 + q_y^2 + q_z^2)^{1/2}$ ([Fig.1]). We know that the inclination axis of electron is $k = $. k has x, y and z. Then, we get the solution that $q_x^2 = q^2 \cos^2 k$ is 1/3. In this way, the baryon has the electric charge that is distributed 1/3 each three quarks. However, the substance of the electric charge is

1. In addition to it, we know $q \sin_x = (q\cos_y, q\cos_z)$. I will give it symbol q^*_x. Then, $(q_x^2 + q_y^2 + q_z^2)^{1/2}$ becomes $(q_x^2 + q^{*2}_x)^{1/2}$. Of course, q^{*2}_x has 2/3 electric charge. We can distribute 1/3 electric charge and 2/3 each two quarks in the meson. Also, we cannot doubt quark confinement on the character of expression $|q|$. Incidentally, will be careful of that this theory is different from QCD.

In addition to the above, we can understand that the anomalous magnetic moment is born by the space has the curvature. We get experiment value μ_e of the magnetic moment by product g' by Bohr magneton μ_b. g' has 1.00115965226 that divided a g-factor by 2. Electronic unity e has angle $+$ in opened space H^9 also has angle $-$ in closed space H^9 under we consider the motion of precession angle. We examine the cosine ratio of them and . The value with ratio $g'_a = \cos / \cos(+)$ in the opened space has 1.001148. The value with ratio $g'_b = \cos(-)/\cos$ in the closed space has 1.001146. By the way, they do not agree with g'. We will describe the remainder of them by suppose the electronic unity has the curvature same as electronic mass m_t.

We can anticipation that electronic unity e has the curvature by the effect that H^9 has the curvature. However, do not get the value of curvature with e because do not find the logical limitation. Nevertheless, all physical quantities have the possibility to be limited by curvature in the space.
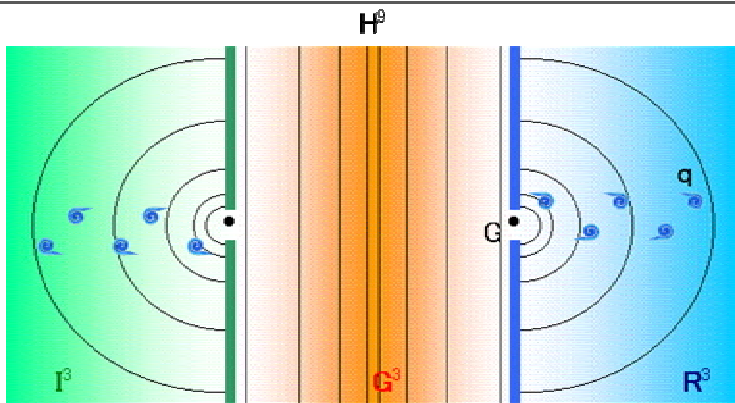
The gravitational constant

We cannot find the gravitational constant by the concept, function that is known same as the mass. Therefore, I take <Kármán Vortex

Street> on the hydrodynamics as you know[11]. Why <Kármán whirlpool>? Because, I think that situation of electron is born in the gap space resembles situation of Kármán whirlpool is born. In this way, electron can be supposed to Kármán whirlpool itself. I^3 shows imaginary space, G^3 shows gap space and R^3 shows real space in [Fig.5]. q is Kármán whirlpool electron and resistance object G is equivalent to the isolate isle in the natural world. The vertical line in G^3 expresses the transverse wave. The arc in R^3, I^3 expresses the diffracted wave, I can suppose that they are the electromagnetic wave. [Fig.6] is the figure that adapted the value that was gotten from the gap space theory to Kármán whirlpool. Here, I give the direction of x and give the direction of y . Make width t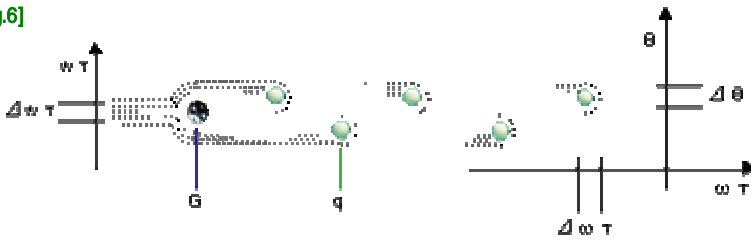o the Kármán whirlpool direction of x and make width to the direction of y . Give isolate isle G width w . The way of giving these values does not have logical limitation, only convenience as visual thinking.

The issue is that do I replace resistance object G to something of the gap space theory. I consider about this. Generally, seem to be that the mass does not born in resistance-less. The standard theory (the G-W-S theory) authorizes that the mass exists there by the Higgs mechanism[12]. In the same way, some mechanism will exist here. For example, it is following one. The Light velocity was decision by that the vacuum has the dielectric constant and magnetic permeability. Therefore, seem to be that the vacuum has viscosity. I think that this viscosity becomes resistance and generates mass. Therefore, I accept that this resistance was generated by whole space H^9 has the

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H^9

I^3 G^3 R^3 G   q

[Fig.6]

curvature. Resistance object G has this meaning in [Fig.5], [Fig.6]. Also, I can explain that G relates to the gravitational constant by accept that the curvature generates gravitation. By the way, G is expressed the reverse of resistance [V^1A^{-1}] on the electromagnetism. As described on the <The creation of the electron>, the unit of the resistance is equal to unit [m^1s^{-1}] with velocity. Therefore, the key point is " velocity v_j" and "the product of time sin_j to acceleration a_j". The relation of both is as follows.

$$w_j \cdot v_j = a_j \cdot sin_j \qquad (13)$$

In this result, the relational expressions of resistance object G are

$$G_j = 1/w_j \cdot v_j$$
$$= 1/a_j \cdot sin_j \qquad (14)$$

I get gravitational constant G_N approximately by numerical calculation of (14) at two points of "j = 1" and "j = n" [Sheet.3]. $G_1 = 6.8246 \times$

10^{11} and $G_n = 6.8211 \times 10^{11}$. By the way, they have A that is the difference about 2% between G_N and G_j. Then, I use the general theory of relativity by Albert Einstein (1879-1955) for this difference. Potential in the field of a particle is gotten by the equation of the gravitational field on the un-relativity, in the above relativity[13]. Actually, has unit [m^1s^{-1}]^2 that is square of the speed. Therefore, I rewrite G_j in (14) use , the result is $G_j = v_j / w_j$. This expression shows us that G_j need correction for adjust to the actual space because it is the gravitational constant on the un-relativity. So, is the gap space theory the one to get merely approximate solution? The conclusion is rashness. I should consider why the equation of gravitational field on the relativity is a nonlinear. In other words, the gap space theory shows an ideal condition in the moment that whole space H^9 was born; on the other hand, the theory of relativity and the quantum theory express the condition that the influence of the self must be considered. Consequently, I should accept that the theory of relativity, the quantum theory and the gap space theory also the value of experiment are correct.

Forward to GUT

Three generations of the elementary particle and the quark confinement are solved by elementary function $f(_j)$ that is a vector on 3-D space.

For example, it is expressed as $F = [f(_1), f(_2), f(_3)]$. As a result, I got the light velocity and Planck's constant by calculates for each ingredient. The mass of elementary particle is calculated in the same way. It is the generation that three solutions are gotten. In conclusion, a particle of each generation

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expresses each three form of some elementary particle. Also, I express the electron spin deal with vector F. Properly, **F** has elevation for each axis, it is certification of a invariable inclination angle that is

$=0.955316618$ ($\cos =(1/3)^{1/2}$)

for electron. In addition to it, I cannot decompose absolute **F**.

$$|\mathbf{F}| = [f(\ _1)^2 + f(\ _2)^2 + f(\ _3)^2]^{1/2} \quad (15)$$

The cause of the quark confinement is existence in here.

These subjects express the interaction in the same way. For example, all interactions are expressed by $f(\ _j)$. Also, **F** is the unification of all interactions. If the space were born in naught, |**F**| must be zero. However, the space has curvature that has a limitation by w

. In this result, |**F**| has minimum value. Certainly, it is the gravitation. Unfortunately, I cannot realize the interaction on value because must take separated w and

. If I discover the logical limitation of w and , get the new way.

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