Quantum Electrogravitational Constants Of Force and Time

-by-

Jerry E. Bayles

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The electrogravitational equation shown below has two A-vectors interacting through a central force constant and in a previous paper[1] a frequency constant was derived for both the A-vector as well as the force constant expression.

System 1 **Energy Space Connector** **System 2**

<------A vector-----> <-----------Force Constant F_{QK}-----------> <------A vector----->

$$F_{EG}=\left(\frac{\mu_o \cdot i_{LM} \cdot \lambda_{LM}}{4 \cdot \pi \cdot \Delta R_x}\right) \cdot \left[\left(\frac{i_{LM} \cdot \lambda_{LM}}{I_q}\right) \cdot \mu_o \cdot \left(\frac{i_{LM} \cdot \lambda_{LM}}{I_q}\right)\right] \cdot \left(\frac{\mu_o \cdot i_{LM} \cdot \lambda_{LM}}{4 \cdot \pi \cdot \Delta R_x}\right)$$

I have previously proposed that Energy Space is a vectorless space filled with energy and further all matter in our universe is connected in a quantum sense with all other matter via energy space such that time of phase information transit between affected matter is essentially zero. Therefore since Energy space is a vectorless space, electrogravitational action occurs as a result of energy density pertubations in the energy field of quantum particles.

Put another way, gravity may occur as a result of the Uncertainty Principle. Particles that fluctuate towards less energy in a quantum sense are coupled instantly through energy space to other particles such that the other particles experience a gain of the same amount of energy. These fluctuations of energy can be quantized to a least expected value and therefore if it is known the quantum time related to the fluctuation, matching that time may serve to couple to energy space for maximum transfer of energy, ether to or from energy space concerning energy related to quantum particles at points distant.

This is somewhat like matching the impedance of an ordinary electromagnetic antenna to free space impedance where it is also known that a good transmitting antenna is a good receiving antenna. In the quantum sense, it may be possible to initiate energy exchange via a quantum time match to and from energy space via the force constant time creating a forced connection to energy space, which is also the connector to all of the matter in the universe.

This paper will present derivations of time intervals that may be necessary to time-gate energy into and from energy space via the related electrogravitational force constant.

The following constants related to the equations in Mathcad are established first as shown below.

$m_e := 9.109389700 \cdot 10^{-31} \cdot kg$ Standard S.I. Units electron rest mass.

$q_o := 1.602177330 \cdot 10^{-19} \cdot coul$ Standard S.I. Units Electron charge.

$\mu_o := 1.256637061 \cdot 10^{-06} \cdot henry \cdot m^{-1}$ Standard S.I. Units Permeability of free space.

$\Phi_o := 2.067834610 \cdot 10^{-15} weber$ Standard S.I. Units Quantum Fluxoid.

$l_q := 2.817940920 \cdot 10^{-15} \cdot m$ Standard S.I. Units Classic Electron Radius.

$h := 6.626075500 \cdot 10^{-34} \cdot joule \cdot sec$ Standard S.I. Units Plank Constant.

$R_{n1} := 5.291772490 \cdot 10^{-11} \cdot m$ Standard S.I. Units Bohr Radius Of Hydrogen n1.

$f_{LM} := 1.003224805 \cdot 10^{01} \cdot Hz$ <u>Basic Quantum Electrogravitational Frequency.</u>

$t_{LM} := f_{LM}^{-1}$ <u>Basic Quantum Electrogravitational Time.</u>

$\lambda_{LM} := 8.514995416 \cdot 10^{-03} \cdot m$ <u>Basic Quantum Electrogravitational Wavelength.</u>

$i_{LM} := 1.607344039 \cdot 10^{-18} \cdot amp$ <u>Basic Quantum Electrogravitational Current.</u>

$\Phi_{ALM} := \frac{\mu_o \cdot i_{LM} \cdot \lambda_{LM}}{4 \cdot \pi}$ $\Phi_{ALM} = 1.368652711927 \times 10^{-27} Wb$ Basic Quantum Electro-gravitational Fluxoid 1)

$A_t := \frac{\Phi_{ALM}}{\Phi_o \cdot (f_{LM})}$ $A_t = 6.597496988356 \times 10^{-14} sec$ <u>**A** vector electrogravitational Time constant.</u> 2)

$A_f := A_t^{-1}$ $A_f = 1.515726345559 \times 10^{13} Hz$ <u>**A** vector electrogravitational frequency constant.</u> 3)

$F_{QK} := \frac{i_{LM} \cdot \lambda_{LM} \cdot i}{l_q} \cdot \mu_o \cdot \frac{i_{LM} \cdot \lambda_{LM} \cdot i}{l_q}$ $F_{QK} = -2.96437144757 \times 10^{-17} N$ 4)

<u>= EG force constant</u>.

$f_{FQK} := \frac{F_{QK} \cdot (\lambda_{LM})}{h}$ $f_{FQK} = -3.809435809685 \times 10^{14} Hz$ <u>Force constant frequency.</u> 5a)

And: $t_{FQK} := f_{FQK}^{-1}$ or, $t_{FQK} = -2.62506063879 \times 10^{-15} s$ <u>Force constant time.</u> 5b)

The ratio of the two E.G. frequency constants above is exactly equal to 8 pi as shown below:

$f_{ratio} := \frac{f_{FQK}}{A_f}$ $f_{ratio} = -2.513274128173 \times 10^{1}$ Note: $\frac{f_{ratio}}{\pi} = -8.000000016874 \times 10^{0}$ 6)

Changing (**A**) vector Per Unit Time x Charge Yields Force

Next is introduced the A-Vector at the Bohr n1 energy level and how that example may be extended to the general case for the purpose of derivation of a fundamental Aforce constant associated with it. It will further be seen that the ratio of the fundamental force constant F_{QK} to Aforce yields the square root of the golden ratio, Φ. The importance of this ratio involving field energy may not be overstated.

$$Avec_{rn1} := \frac{\Phi_{ALM}}{R_{n1}} \qquad Avec_{rn1} = 2.586378599068 \times 10^{-17} \frac{volt \cdot sec}{m} \qquad \text{(At Rn1)} \qquad 7)$$

$$Amom_{rn1} := (q_o) \cdot \frac{\Phi_{ALM}}{R_{n1}} \qquad Amom_{rn1} = 4.143837158224 \times 10^{-36} \frac{kg\,m}{s} \qquad \text{(At Rn1)} \qquad 8)$$

Letting R_{n1} be increased to λ_{LM} , (canceling the numerator λ_{LM} term in eq. 1), then dividing the A_t time by 2π while combining the q_o terms and establishing A'_t as:

$$A'_t := \frac{A_t}{2 \cdot \pi} \qquad A'_t = 1.050024257731 \times 10^{-14} s \qquad \text{where,} \quad \frac{1}{A'_t} = 9.523589504124 \times 10^{13} Hz \qquad 9)$$

Then: $$Aforce := \frac{d}{dA'_t}\left[\left(\frac{\mu_o}{4 \cdot \pi}\right) \cdot \frac{{q_o}^2}{A'_t}\right] \qquad \text{or,} \qquad Aforce = -2.3282118753 \times 10^{-17} newton \qquad 10)$$

Note the result is a negative force and therefore is a force of attraction.

The + golden ratio Φ is given by the equation:

$$\Phi := \frac{1+\sqrt{5}}{2} \quad \text{or,} \quad \Phi = 1.61803398875 \times 10^0 \quad \text{and the ratio of forces } F_{QK} \text{ to Aforce is:} \qquad 11)$$

$$\frac{F_{QK}}{Aforce} = 1.273239553074 \times 10^0 \text{ and, } \sqrt{\Phi} = 1.272019649514 \times 10^0 \text{ and } \quad \frac{4}{\pi} = 1.273239544735 \times 10^0$$

$$F_{max} := \sqrt{{F_{QK}}^2 + Aforce^2} \qquad F_{max} = 3.769359178356 \times 10^{-17} newton \qquad \frac{F_{max}}{Aforce} = -1.618993193165 \times 10^0$$

Taking the derivative with respect to the Avec time of the momentum (Amom) develops a negative force that may interact with the force constant F_{QK} and the resultant atan of the ratio of the force constant F_{QK} to the force resultant of the derivative with respect to time of the Amom is equal to the angle of rise of the side of the Great Pyramid. This suggests that the geometry of the Great Pyramid may have been designed to be able to tap into the energy space associated with the force constant.

Further, if the time related to the frequency of the force constant f_{FQK} (eq. 5) is multiplied by 4 and this time is used in the derivative of the momentum vector (Amom) with respect to time, a force is arrived at that is shown below to have a ratio equal to the square root of the golden ratio as was shown above. This suggests that an even multiple of 4 times the f_{FQK} time (when expressed as a rate of change of the Amom with respect to that time) will also interface with the force constant F_{QK} at a ratio equal to the square root of the golden ratio.

$$t'_{FQK} := \frac{4}{f_{FQK}} \qquad t'_{FQK} = -1.050024255516 \times 10^{-14}\,s$$ (Same as eq. 9 for A'_t above.) 12)

$$Force_{FQKtime} := \frac{d}{dt'_{FQK}}\left[\left(\frac{\mu_o}{4\cdot\pi}\right)\cdot\frac{q_o^{\,2}}{t'_{FQK}}\right]$$

Or:

$$Force_{FQKtime} = -2.328211885122 \times 10^{-17}\,N$$ 13)

where: $Aforce = -2.3282118753 \times 10^{-17}\,N$

Where:

The ratio: $$\frac{F_{QK}}{Force_{FQKtime}} = 1.273239547703 \times 10^{0}$$

$$A'_t{}^{-1} = 9.523589504124 \times 10^{13}\,Hz$$ 14)

$$t'_{FQK}{}^{-1} = -9.523589524212 \times 10^{13}\,Hz$$ 15)

The above equal frequencies of eq. 14 and 15 may be considered as a frequency that may interact strongly with the main electrogravitational force constant F_{QK} in eq. 4 as well as the A vector constant frequency of eq. 3 above. Next is introduced mass as composed of a superposition of a single charge in a standing wave field configuration. Charge squared is the same charge interacting with its own field through a least quantum distance of uncertainty in position. This forms two standing wave rings very close and parallel to each other.

$$m'_e := \frac{\mu_o\cdot q_o^{\,2}}{4\cdot\pi\cdot l_q} \qquad m'_e = 9.109389688253 \times 10^{-31}\,kg$$ = Electron Compton rest mass. 16)

$$me_{field} := \frac{\mu_o\cdot q_o^{\,2}}{4\cdot\pi\cdot R_{n1}} \qquad me_{field} = 4.850874070505 \times 10^{-35}\,kg$$ = Field mass at Bohr n1 level. 17)

Let: $$v_{LM} := \lambda_{LM}\cdot t_{LM}{}^{-1} \qquad v_{LM} = 8.542454615792 \times 10^{-2}\,\frac{m}{s}$$ Least quantum electrogravitational velocity. 18)

and $\alpha := 7.297353080 \cdot 10^{-03}$ = Fine structure constant. $\sqrt{\alpha} = 8.542454612112 \times 10^{-2}$

Let the force constant F_{QK} be used in part to include the imaginary operator i and then using the A-vector as well as only the left hand portion of the Energy Space connector related to F_{QK} above, we can derive the magnetic force between parallel current rings at the radius of the n1 level of the Hydrogen atom. This is shown below.

$$force_{n1} := \frac{\mu_o\cdot(q_o)\cdot\lambda_{LM}}{4\cdot\pi\cdot R_{n1}\cdot t_{LM}}\cdot\left[\frac{(q_o)\cdot\lambda_{LM}\cdot i}{l_q\cdot t_{LM}}\right]$$ or, $$force_{n1} = 1.256184635326i \times 10^{-22}\,newton$$ 19)

Note that the $force_{n1}$ magnitude is $\alpha^2/4\pi$ of the F_{QK} value. The inertial form of EG eq. is shown below.

$$F_{EGinertial} := \frac{m_e \cdot v_{LM}^2 \cdot i}{R_{n1}} \cdot \mu_o \cdot \frac{m_e \cdot v_{LM}^2 \cdot i}{R_{n1}}$$

This illustrates the dual energy/distance interaction form of the EG equation. It is an interaction of a double set of charge rings as explained above. 20)

$$F_{EGinertial} = -1.982973083832 \times 10^{-50} \text{newton} \cdot \frac{\text{henry}}{\text{m}} \cdot \text{newton}$$

We may also use the force_{n1} as shown below to create the two-force electrogravitational equation as:

$$F_{EG} := \text{force}_{n1} \cdot \mu_o \cdot \text{force}_{n1}$$ or, $$F_{EG} = -1.982973078718 \times 10^{-50} \text{newton} \cdot \frac{\text{henry}}{\text{m}} \cdot \text{newton}$$ 21)

The newton terms each vary inversely with distance and the henry/m is taken as a constant so that the expression varies as $1/r^2$ insofar as distance between the two systems involving R_{n1} is concerned.

The above result may be compared as being very close in magnitude to the Newtonian gravitational force between two electron masses at a separation distance equal to R_{n1} as shown below.

First, let the universal gravitational constant be stated for the purpose of evaluation as:

$$G := 6.672590000 \cdot 10^{-11} \cdot \text{newton} \cdot \text{m}^2 \cdot \text{kg}^{-2}$$ Then: $$F_G := \frac{G \cdot m_e \cdot m_e}{R_{n1}^2}$$ 22)

or, $F_G = 1.977291388969 \times 10^{-50}\,\text{N}$ and, $\frac{F_{EG}}{F_G} = -1.002873471144 \times 10^{0} \text{newton} \cdot \frac{\text{henry}}{\text{m}}$

It is now of interest to find the time related to the derivative of the momentum related to the A-vector acting on a charge such that the magnitude of the result <u>exactly equals the force constant F_{QK} in eq. 4 above.</u> Charge times the A-vector is momentum and taking the derivative of momentum with respect to time yields force.

We use Mathcad's symbolic processor below to solve for Δt_{QK}, the required time change interval, by setting the A-vector action force equal to F_{QK}.

Further, the derivative is taken with respect to time of the eqs. 10 and 13 which are independent of distance which makes the result based solely on time change and thus is more fundamental.

$$F_{QK} = \frac{d}{d\Delta t'_{QK}}\left[\left(\frac{\mu_o}{4 \cdot \pi}\right) \cdot \frac{q_o^2}{\Delta t'_{QK}}\right]$$

Solved for time has solution(s):

$$\begin{bmatrix} \frac{1}{2 \cdot F_{QK} \cdot \pi} \cdot \left(-F_{QK} \cdot \pi \cdot \mu_o\right)^{\frac{1}{2}} \cdot q_o \\ \frac{-1}{2 \cdot F_{QK} \cdot \pi} \cdot \left(-F_{QK} \cdot \pi \cdot \mu_o\right)^{\frac{1}{2}} \cdot q_o \end{bmatrix}$$ 23)

Where: $F_{QK} = -2.96437144757 \times 10^{-17} \text{newton}$

Δ Time and Δ Frequency Solutions For Eq. 23 Above:

$$\Delta t'_{QKa} := \frac{1}{2 \cdot F_{QK} \cdot \pi} \cdot \left(-F_{QK} \cdot \pi \cdot \mu_o\right)^{\frac{1}{2}} \cdot q_o \quad \text{and:} \quad \Delta f'_{QKa} := \Delta t'_{QKa}{}^{-1} \qquad 24)$$

$$\Delta t'_{QKa} = -9.305597665321 \times 10^{-15}\,\text{s} \qquad \Delta f'_{QKa} = -1.074622002761 \times 10^{14}\,\text{Hz}$$

$$\Delta t'_{QKb} := \frac{-1}{2 \cdot F_{QK} \cdot \pi} \cdot \left(-F_{QK} \cdot \pi \cdot \mu_o\right)^{\frac{1}{2}} \cdot q_o \quad \text{and:} \quad \Delta f'_{QKb} := \Delta t'_{QKb}{}^{-1} \qquad 25)$$

$$\Delta t'_{QKb} = 9.305597665321 \times 10^{-15}\,\text{s} \qquad \Delta f'_{QKb} = 1.074622002761 \times 10^{14}\,\text{Hz}$$

Check Of Force Results With Respect To Above Δ Time Derivatives:

$$F'_{QKa} := \frac{d}{d\Delta t'_{QKa}}\left[\left(\frac{\mu_o}{4 \cdot \pi}\right) \cdot \frac{q_o{}^2}{\Delta t'_{QKa}}\right] \qquad F'_{QKa} = -2.96437144757 \times 10^{-17}\,\text{newton} \qquad 26)$$

where eq. 4 original is: $F_{QK} = -2.96437144757 \times 10^{-17}\,\text{newton}$

$$F'_{QKb} := \frac{d}{d\Delta t'_{QKb}}\left[\left(\frac{\mu_o}{4 \cdot \pi}\right) \cdot \frac{q_o{}^2}{\Delta t'_{QKb}}\right] \qquad F'_{QKb} = -2.96437144757 \times 10^{-17}\,\text{newton} \qquad 27)$$

Where also: $\frac{f_{FQK}}{\Delta f'_{QKa}} = 3.544907697679 \times 10^{0}$ And: $\sqrt{4 \cdot \pi} = 3.544907701811 \times 10^{0}$

Least Quantum Electrogravitational Energy And Related Frequency:

Note: $\left[F'_{QKa} \cdot \left(\frac{l_q}{4 \cdot \pi}\right)\right] \cdot h^{-1} = -1.003224803541 \times 10^{1}\,\text{Hz}$ And: $f_{LM} = 1.003224805 \times 10^{1}\,\text{Hz}$ 28)

The above is a fundamentally important result.

Where also: $\lambda_p := 1.321410020 \cdot 10^{-15} \cdot \text{m}$ **= Proton Compton wavelength**

And: $\frac{l_q}{4 \cdot \pi} = 2.242446133795 \times 10^{-16}\,\text{m}$ And: $\frac{\lambda_p}{2 \cdot \pi} = 2.103089365342 \times 10^{-16}\,\text{m}$

It is significant that the distance required for the fundamental electrogravitational frequency f_{LM} result is both smaller and close to the Compton radius of the proton. Thus electrogravitational action may be fundamentally related to the nuclear quantum realm.

Let the following expressions be stated for the comparison of previous DeBroglie wavelengths in Ref. 1.

Let: $c := 2.997924580 \cdot 10^{08} \cdot \frac{m}{sec}$ $\quad \Phi_{pos} := \frac{1+\sqrt{5}}{2}$ $\quad \Phi_{neg} := \frac{1-\sqrt{5}}{2}$

$\frac{4}{\pi} = 1.273239544735 \times 10^{0}$ $\quad \sqrt{\Phi_{pos}} = 1.272019649514 \times 10^{0}$

$\frac{\pi}{4} = 7.853981633974 \times 10^{-1}$ $\quad \sqrt{\Phi_{neg}} = 7.861513777574i \times 10^{-1}$

$\lambda_c := \frac{c}{\Delta f'_{QKb}}$ $\quad \lambda_c = 2.789747997246 \times 10^{-6} m$ **<u>Adjusted EG Electromagnetic Wavelength.</u>** 29)

Where from a previous paper[1], $\lambda'_{fc} := 3.1478935252 \cdot 10^{-06} \cdot m$ (Eq. 23, p.5 of ref. 1)

Note that: $\frac{\lambda'_{fc}}{\lambda_c} = 1.128379168408 \times 10^{0}$ and $\sqrt[4]{\Phi_{pos}} = 1.127838485562 \times 10^{0}$ 30)

which is the fourth root of the positive golden ratio Φ

Next, the Compton wavelength relative to the Compton energy equation E = hf is solved for as shown in eq. 31 below. The <u>DeBroglie wavelength</u> related to $h\Delta f'_{QKa}$ and $h\Delta f'_{QKb}$ is:

$\lambda_{dba} := \frac{h}{m_e \cdot \sqrt{\frac{h \cdot \Delta f'_{QKa}}{m_e}}}$ $\quad \lambda_{dba} = -2.601690822729i \times 10^{-9} m$ This adjusted DeBroglie wavelength is required to exactly match the F_{QK} constant above. 31)

$\lambda_{dbb} := \frac{h}{m_e \cdot \sqrt{\frac{h \cdot \Delta f'_{QKb}}{m_e}}}$ $\quad \lambda_{dbb} = 2.601690822729 \times 10^{-9} m$ 32)

Where from a previous paper[1], $\lambda'_{db} := 2.7636511046 \cdot 10^{-09} \cdot m$ (Eq. 24, p. 5 of ref. 1)

$\frac{\lambda'_{db}}{\lambda_{dba}} = 1.062251932649i \times 10^{0}$ 33)

where, $\sqrt[8]{\Phi_{pos}} = 1.061997403745 \times 10^{0}$

$\frac{\lambda'_{db}}{\lambda_{dbb}} = 1.062251932649 \times 10^{0}$ 34)

The force constant F_{QK} is the non-local connection through energy space to all points existing in local space. Local (relativistic) space features the speed of light as being constant regardless of the relative motion of any observer. In contrast to local space, **I propose that time is a constant in non-local energy space and passage via non-local space to all points in local space occur at the same small time interval. Therefore, phase velocity increases with distance between points in local space so that distance increases proportional to that phase velocity while the non-local connection time remains constant.**

Also, non-local energy increases as distance increases, as for the gluon, while the local to local force connection remains constant. Momentum will also remain constant since field mass (eq. 17) is inverse to distance while velocity is proportional to that same distance.

The concept of time as a constant is counterintuitive but the concept applies to non-local space where the limit of velocity is practically unlimited compared to local space. A contemporary expression is: "You have to think outside the box!" This can be rephrased to: "You have to think outside the light cones!" Each light cone is a variable-time local system in a relativistic sense and all local systems are interconnected via the constant-time non-local energy space in a quantum sense.

Thus, electrogravitational theory does not do away with the theory of relativity but rather incorporates it as a sub-function of local space systems which are then connected by the all encompassing force constant mechanism operating via energy space, just as Einstein's theory incorporated Newton's theory as a sub-function or "special case" of the theory of relativity.

The theory of electrogravitation does do away with the need of higher dimensions and therefore string theory is no longer required. The inability of present day physics to solve the gravitational mechanism is due to the requirement that gravitational action must occur via a relativistic space-time located only within the allowable light-cone neighborhood. As a result, higher dimensions have been evoked to hopefully provide a route to a solution of the complicated differential tensor calculus equations of general relativity and the picture is further complicated by the super string M-theory, which no one really understands. (M stands for mystery.) Present day physics is tied up in knots, literally!

Another logical paradox is that of the gravitational field surrounding a black hole if we limit the velocity of propagation of the gravitational field to the speed of light. It is a fundamental requirement of the theory of relativity that so called *gravitational waves* travel at the velocity of light. If light cannot escape the gravitational field at the event horizon, how could gravity? Further, if a black hole's mass were to increase over time as it swallows matter, how is it that the gravitational field would be able to increase at points outside of the event horizon if that information is confined by the event horizon?

I would also like to point out that the connection point that unifies all possible dimensions begins with a single point and that a single point is thus connected to all dimensions. Therefore, we do not need higher dimensions to have a unification method. Everything is connected to everything else back to the 'point-event' of the Big Bang and also, all matter is connected from one instant of progressing time to the next. Positive mass exists in positive time and negative mass does not naturally exist because it travels backwards in time until it no longer exists in our positive time universe. Cause and effect are one-way for our universe, directed by the arrow of time so that a stable system may continue to evolve for all time.

On a related note, (concerning logical paradoxes), ignoring the magnetic force as being a very weak force compared to the electric force is to ignore the very important fact that gravity is also a very weak force and therefore we should consider that the magnetic force may have the necessary magnitude and field geometry to create the gravitational field. For example, the A-vector is magnetic field related and cannot be shielded against. Therefore, the magnetic vector potential satisfies a very basic requirement for the necessary mechanics related to gravitation. Further, if we consider that at least two A-vector sources may be connected by the force constant as outlined above, then we have quite likely moved much closer to understanding of the true geometry and field mechanics of gravitation. Thus we now have five forces instead of four since the so-called electromagnetic force is allowed to have not only the electric, but also the magnetic force-field related A-vector.

Let us review the golden ratio related expressions in eqs. 11, 14, 30, 33 and 34 for a moment. I propose that the force constant F_{QK} is a fixed magnitude while the Aforce is a dynamic. Also, the F_{QK} force constant has imaginary terms while Aforce is real. A change from the open and fixed magnitude imaginary field to contained but real changing time standing wave torus reduces the field volume by 1/sqrt. of Φ and also root powers of Φ as we observed in eqs. 30,33 and 34.

Fundamental force related to time $\Delta t'_{QKb}$ (eq. 25), electron mass m_e , λ_c / l_q:

Note: $\lambda_c = 2.789747997246 \times 10^{-6}\,\mathrm{m}$ $\Delta t'_{QKb} = 9.305597665321 \times 10^{-15}\,\mathrm{sec}$

$$F_c := \frac{d}{d\Delta t'_{QKa}}\left[\left(\frac{\mu_o}{4\cdot\pi}\right)\cdot\frac{q_o^2}{\Delta t'_{QKa}}\right]\cdot\frac{\lambda_c}{l_q} \quad \text{where,} \quad \frac{\mu_o\cdot q_o^2}{4\cdot\pi\cdot l_q} = 9.109389688253\times 10^{-31}\,\mathrm{kg} \qquad 35)$$

$$F_c = -2.934713517326\times 10^{-8}\,\mathrm{newton} \quad \text{and,} \quad \frac{\lambda_c}{\Delta t'_{QKb}} = 2.99792458\times 10^{8}\,\frac{\mathrm{m}}{\mathrm{s}} \quad = \text{Vel. of light.}$$

A fundamental DeBroglie velocity in terms of λ_c (eq.29) and electron mass is:

$$v_c := \frac{h}{m_e\cdot\lambda_c} \qquad v_c = 2.607366756303\times 10^{2}\,\frac{\mathrm{m}}{\mathrm{s}} \qquad 36)$$

Then a fundamental λ_c and m_e related energy is:

$$F_c\cdot\lambda_c = -8.187111157449\times 10^{-14}\,\mathrm{joule}$$

Note that: $m_e\cdot c^2 = 8.187111168007\times 10^{-14}\,\mathrm{joule}$ = electron rest mass.

$$\frac{m_e\cdot c^2 + F_c\cdot\lambda_c}{h}\cdot 2 = 3.186645154795\times 10^{11}\,\mathrm{Hz}$$

Very close to peak of cosmic background radiation frequency, = 2.9979 x 10^11 Hz.

The slight energy difference of the conjugate $E = mc^2$ and $-E = F_c\lambda_c$ above may be partly if not totally responsible for the cosmic background radiation and not the big bang as is presently postulated by contemporary physics. Further, F_c is slightly less than the R_{n1} force of an electron in the Bohr atom. Could this be responsible for the scaling of force starting with the n1 orbital as well as the 60 degree angle predominate in atomic and thus molecular structure? For example:

$$\varepsilon_o := \frac{1}{\mu_o \cdot c^2} \qquad \varepsilon_o = 8.854187820692 \times 10^{-12}\,\frac{\text{farad}}{\text{m}}$$

$$F_e := \frac{{q_o}^2}{4 \cdot \pi \cdot \varepsilon_o \cdot (R_{n1})^2} \qquad F_e = 8.238729462587 \times 10^{-8}\,\text{N}$$

$$\frac{F_e}{F_c} = -2.807336870855 \times 10^0 \quad \text{and} \quad \operatorname{atan}\left(\frac{F_e}{F_c \cdot \Phi}\right) = -6.004261314402 \times 10^1\,\text{deg} \qquad 37)$$

Least Quantum Electrogravitational Inductance:

Quantum Ohm: $R_Q := 2.581280560 \cdot 10^{04} \cdot \text{ohm}$ Standard S.I. Unit.

$$L_{Qa} := 2 \cdot \left(\Phi_o \cdot {i_{LM}}^{-1}\right) \qquad L_{Qa} = 2.572983206864 \times 10^3\,\text{henry} \qquad 38a)$$

$$L_{Qb} := R_Q \cdot t_{LM} \qquad L_{Qb} = 2.572983190941 \times 10^3\,\text{henry} \qquad 38b)$$

$$L_{Qc} := \mu_o \cdot \pi \cdot \left(\frac{\lambda_{LM}}{2 \cdot \pi}\right)^2 \cdot {l_q}^{-1} \qquad L_{Qc} = 2.572983216034 \times 10^3\,\text{henry} \qquad 38c)$$

Fundamental EG A-Vector in terms of $\Delta t'_{QKb}$ is: (Where fundamental **A** = L I / r)

$$A_{fund} := \mu_o \cdot q_o \cdot {\Delta t'_{QKb}}^{-1} \qquad 39)$$

$$A_{fund} = 2.163596024224 \times 10^{-11}\,\frac{\text{volt} \cdot \text{sec}}{\text{m}}$$

Least Quantum Momentum:

$$P_{fund} := q_o \cdot A_{fund} \qquad 40a)$$

$$P_{fund} = 3.46646450129 \times 10^{-30}\,\frac{\text{kg}\,\text{m}}{\text{s}}$$

Adjusted permeability so P_{fund} =

$$P_{adj} := v_c \cdot m_e \qquad 40b)$$

$$P_{adj} = 2.375151987399 \times 10^{-28}\,\frac{\text{kg}\,\text{m}}{\text{s}}$$

Note: $\frac{P_{adj}}{P_{fund}} = 6.851799539602 \times 10^1$ = 1/2 of 1 / fine structure constant, α.

Bringing it all together as a partial summary:

momentum = (henry/m) (amp) (charge). Solving P_{adj} for distance r_{adj}:

$$P_{adj} = \frac{L_{Qa}}{r_{adj}} \cdot \frac{q_o}{\Delta t'_{QKb}} \cdot q_o$$ has solution(s) $$L_{Qa} \cdot \frac{q_o^2}{P_{adj} \cdot \Delta t'_{QKb}}$$ Then: 41)

$$r_{adj} := L_{Qa} \cdot \frac{q_o^2}{P_{adj} \cdot \Delta t'_{QKb}}$$ or, $$r_{adj} = 2.98828792086 \times 10^{7}\,\mathrm{m}$$ Then: 42)

$$\mu_{adj} := \frac{L_{Qa}}{r_{adj}}$$ or, $$\mu_{adj} = 8.610225236007 \times 10^{-5}\,\frac{\mathrm{henry}}{\mathrm{m}}$$ where also, 43)

$$\frac{\mu_{adj}}{\mu_o} = 6.851799539602 \times 10^{1}$$ where also, $$\frac{1}{2 \cdot \alpha} = 6.851799474667 \times 10^{1}$$ and, 44)

$$\frac{R_Q}{\mu_o \cdot c} = 6.851799466775 \times 10^{1}$$ = quantum Hall Ohm R_Q / Free Space Impedance R_S. 45)

NOTE: $$\frac{c}{r_{adj}} = 1.003224809455 \times 10^{1}\,\mathrm{Hz}$$ and $$f_{LM} = 1.003224805 \times 10^{1}\,\mathrm{Hz}$$ 46)

It may be of interest to form a ferromagnetic material with the permeability of eq. 43 above.

The form of eq. 35 presents the A-vector in its classic form as presented by Schaum's Electromagnetics booklet, p. 141, chapter 9, copyright 1995 by McGraw-Hill Co. For a current filament:

$$A = \oint \frac{\mu \cdot I \cdot dl}{4 \cdot \pi \cdot R}$$ where, $$R = \sqrt{x^2 + y^2 + z^2}$$ and dl is a finite length regarding the path of the current. 47)

A more succinct derivation of a fundamental Electrogravitational A-vector can be stated without dl and R as:

$$A_{LMfund} := \mu_o \cdot i_{LM}$$ or, $$A_{LMfund} = 2.019848089185 \times 10^{-24}\,\frac{\mathrm{volt} \cdot \mathrm{sec}}{\mathrm{m}}$$ 48)

From the above a fundamental force is also derived as:

$$F_{LMfund} := \mu_o \cdot i_{LM}^2 \qquad F_{LMfund} = 3.246590785837 \times 10^{-42}\,\mathrm{newton}$$ 49)

We can set the above force result equal to the force constant F_{QK} and then use Mathcad's symbolic processor to solve for the time associated with the current term above.

$$F_{QK} = \mu_o \cdot \left(\frac{q_o}{t_{QK}}\right)^2$$ Solved for t_{QK} has solution(s) $$\begin{bmatrix} \frac{1}{F_{QK}} \cdot (F_{QK} \cdot \mu_o)^{\frac{1}{2}} \cdot q_o \\ \frac{-1}{F_{QK}} \cdot (F_{QK} \cdot \mu_o)^{\frac{1}{2}} \cdot q_o \end{bmatrix}$$ 50) 51)

Equivalent: $F = L \cdot I^2$

Then: $t_{QKa} := \frac{1}{F_{QK}} \cdot (F_{QK} \cdot \mu_o)^{\frac{1}{2}} \cdot q_o$ $\qquad t_{QKa} = -2.019834176202 \times 10^{-30} - 3.298748483375i \times 10^{-14}\,s$

$f_{QKa} := t_{QKa}^{-1}$ $\qquad f_{QKa} = -4.875009054021 \times 10^{-3} + 3.031452701046i \times 10^{13}\,Hz$

52)

And: $t_{QKb} := \frac{-1}{F_{QK}} \cdot (F_{QK} \cdot \mu_o)^{\frac{1}{2}} \cdot q_o$ $\qquad t_{QKb} = 2.019834176202 \times 10^{-30} + 3.298748483375i \times 10^{-14}\,s$

$f_{QKb} := t_{QKb}^{-1}$ $\qquad f_{QKb} = 1.856168119507 \times 10^{-3} - 3.031452701046i \times 10^{13}\,Hz$

Where: $\left|\frac{t_{QKa}}{A'_t}\right| = 3.141592643302 \times 10^0$ 53a) and: $\left|\frac{t_{QKa}}{t'_{FQK}}\right| = 3.141592649928 \times 10^0$ 53b)

The electrogravitational force between two electrons at the Bohr Rn1 energy level is now solved for a common time t_{QKa} above for the common r_x action distance unknown in the below equation.

$$F_{EG} = \left(\mu_o \cdot \frac{q_o}{t_{QKa}} \cdot \frac{r_x}{R_{n1}}\right) \cdot \left[\mu_o \cdot \left(\frac{q_o}{t_{QKa}}\right)^2\right] \cdot \left(\mu_o \cdot \frac{q_o}{t_{QKa}} \cdot \frac{r_x}{R_{n1}}\right) \qquad 54)$$

Solved for r_x has solution(s)

$$\begin{bmatrix} \frac{1}{\mu_o^2} \cdot (\mu_o \cdot F_{EG})^{\frac{1}{2}} \cdot t_{QKa}^2 \cdot \frac{R_{n1}}{q_o^2} \\ \frac{-1}{\mu_o^2} \cdot (\mu_o \cdot F_{EG})^{\frac{1}{2}} \cdot t_{QKa}^2 \cdot \frac{R_{n1}}{q_o^2} \end{bmatrix}$$

Note: $\sqrt{\frac{Re(f_{QKa})}{Re(f_{QKb})}} = 1.620612031137i \times 10^0$ 55)

And: $\left(\frac{4}{\pi}\right)^2 = 1.621138938277 \times 10^0$ $\Phi = 1.61803398875 \times 10^0$ 56)

The real frequencies of f_{QKa} and f_{QKb} have a ratio inside a square root very close in magnitude to $(4/\pi)$ squared which is very close to the golden ratio, Φ.

Then the electrogravitatonal A-vector action distance r_x for the related current is:

57)

$$r_{xa} := \frac{1}{\mu_o^2} \cdot (\mu_o \cdot F_{EG})^{\frac{1}{2}} \cdot t_{QKa}^2 \cdot \frac{R_{n1}}{q_o^2} \qquad r_{xa} = -4.119170677706 \times 10^{-32} - 2.242446135091i \times 10^{-16} m$$

58)

$$r_{xb} := \frac{-1}{\mu_o^2} \cdot (\mu_o \cdot F_{EG})^{\frac{1}{2}} \cdot t_{QKa}^2 \cdot \frac{R_{n1}}{q_o^2} \qquad r_{xb} = 4.119170677706 \times 10^{-32} + 2.242446135091i \times 10^{-16} m$$

Then the electrogravitational force related to r_{xa} is:

$$F_{EGrxa} := \left(\mu_o \cdot \frac{q_o}{t_{QKa}} \cdot \frac{r_{xa}}{R_{n1}}\right) \cdot \left[\mu_o \cdot \left(\frac{q_o}{t_{QKa}}\right)^2\right] \cdot \left(\mu_o \cdot \frac{q_o}{t_{QKa}} \cdot \frac{r_{xa}}{R_{n1}}\right) \qquad 59)$$

$$F_{EGrxa} = -1.982973078718 \times 10^{-50} + 2.428361431657i \times 10^{-66} newton \cdot \frac{henry}{m} \cdot newton$$ Checks o.k.

And the electrogravitational force related to r_{xb} is:

$$F_{EGrxb} := \left(\mu_o \cdot \frac{q_o}{t_{QKa}} \cdot \frac{r_{xb}}{R_{n1}}\right) \cdot \left[\mu_o \cdot \left(\frac{q_o}{t_{QKa}}\right)^2\right] \cdot \left(\mu_o \cdot \frac{q_o}{t_{QKa}} \cdot \frac{r_{xb}}{R_{n1}}\right) \qquad 60)$$

$$F_{EGrxb} = -1.982973078718 \times 10^{-50} + 2.428361431657i \times 10^{-66} newton \cdot \frac{henry}{m} \cdot newton$$ Checks o.k.

where: $F_{EG} = -1.982973078718 \times 10^{-50} newton \cdot \frac{henry}{m} \cdot newton$

Note that: $\left|\frac{r_{xa} \cdot 4 \cdot \pi}{l_q}\right| = 1.000000000578 \times 10^0$ and: $\frac{\lambda_p}{2 \cdot \pi} \cdot \left(\frac{l_q}{4 \cdot \pi}\right)^{-1} = 9.378550207504 \times 10^{-1}$ 61)

Then r_{xa} and r_{xb} both are equal in absolute magnitude to the classic electron radius l_q divided by 4π.
See eq. 28 above for related result.

Note that the time t_{QKa} and t_{QKb} is common to the A-vectors in system 1 and 2 and also the force constant F_{QK} and therefore the entire electrogravitational force expression depends on one fundamental time constant where the absolute frequency is:

$|f_{QKa}| = 3.031452701046 \times 10^{13} Hz$ $\qquad |f_{QKb}| = 3.031452701046 \times 10^{13} Hz$

The current related to t_{QKa} is:

$$\Delta I_{QKa} := q_o \cdot t_{QKa}^{-1} \qquad \Delta I_{QKa} = -7.810628989897 \times 10^{-22} + 4.856924794584i \times 10^{-6}\,\text{amp}$$ 62)

$$F_{QKfund} := \left(\frac{q_o}{t_{QKa}}\right) \cdot \mu_o \cdot \left(\frac{q_o}{t_{QKa}}\right)$$

$$F_{QKfund} = -2.96437144757 \times 10^{-17} - 3.630188109783i \times 10^{-33}\,\text{newton}$$ 63)

Where: $F_{QK} = -2.96437144757 \times 10^{-17}\,\text{newton}$

64)

$$Avec_{Rn1} := \frac{\mu_o \cdot \frac{(q_o)}{t_{QKa}} \cdot \frac{l_q}{4 \cdot \pi}}{R_{n1}} \qquad Avec_{Rn1} = -1.583647832904 \times 10^{-33} + 2.586378599068i \times 10^{-17}\,\frac{\text{volt} \cdot \text{sec}}{\text{m}}$$

$$F_{Gfund} := \frac{\mu_o \cdot \frac{(q_o)}{t_{QKa}} \cdot \frac{l_q}{4 \cdot \pi}}{R_{n1}} \cdot \left[\left(\frac{q_o}{t_{QKa}}\right) \cdot \mu_o \cdot \left(\frac{q_o}{t_{QKa}}\right)\right] \cdot \frac{\mu_o \cdot \frac{(q_o)}{t_{QKa}} \cdot \frac{l_q}{4 \cdot \pi}}{R_{n1}}$$ 65)

$$F_{Gfund} = 1.982973076425 \times 10^{-50} + 4.856722857698i \times 10^{-66}\,\text{newton} \cdot \frac{\text{henry}}{\text{m}} \cdot \text{newton}$$

It is possible to set the force constant F_{QK} equal to parameters involving the permittivity of free space, ε_o, instead of the permeability of free space, μ_o.

$$F_{QK} = \varepsilon_o \cdot V_{QK}^2 \quad \text{has solution(s)} \quad \begin{bmatrix} \frac{1}{\varepsilon_o} \cdot (\varepsilon_o \cdot F_{QK})^{\frac{1}{2}} \\ \frac{-1}{\varepsilon_o} \cdot (\varepsilon_o \cdot F_{QK})^{\frac{1}{2}} \end{bmatrix}$$ 66)

or,

$$V_{QKa} := \frac{1}{\varepsilon_o} \cdot (\varepsilon_o \cdot F_{QK})^{\frac{1}{2}} \qquad V_{QKa} = 1.120362227605 \times 10^{-19} + 1.829750799689i \times 10^{-3}\,\text{V}$$ 67)

$$V_{QKb} := \frac{-1}{\varepsilon_o} \cdot (\varepsilon_o \cdot F_{QK})^{\frac{1}{2}} \qquad V_{QKb} = -1.120362227605 \times 10^{-19} - 1.829750799689i \times 10^{-3}\,\text{V}$$ 8)

$$f_{VQKa} := q_o \cdot \frac{V_{QKa}}{h} \qquad f_{VQKa} = 2.709022803102 \times 10^{-5} + 4.424316099041i \times 10^{11}\,\text{Hz} \qquad 69)$$

$$\left|\frac{f_{QKa}}{f_{VQKa}}\right| = 6.851799539602 \times 10^{1} \qquad \frac{1}{2 \cdot \alpha} = 6.851799474667 \times 10^{1} \qquad 70)$$

The force constant F_{QK} related to the quantum voltage constant and ε_o is:

$$\varepsilon_o \cdot V_{QKa}^{2} = -2.96437144757 \times 10^{-17} + 3.630188109783i \times 10^{-33}\,\text{newton} \qquad 71)$$

Where: $F_{QK} = -2.96437144757 \times 10^{-17}\,\text{N}$

Then:

Local Non-Local Local

$$F_{GVQK} := \left(\mu_o \cdot \frac{q_o}{t_{QKa}} \cdot \frac{r_{xa}}{R_{n1}}\right) \cdot \left(\varepsilon_o \cdot V_{QKa}^{2}\right) \cdot \left(\mu_o \cdot \frac{q_o}{t_{QKa}} \cdot \frac{r_{xa}}{R_{n1}}\right) \qquad 72)$$

Thus,

$$F_{GVQK} = -1.982973078718 \times 10^{-50} + 7.285084294971i \times 10^{-66}\,\text{newton} \cdot \frac{\text{henry}}{\text{m}} \cdot \text{newton}$$

Individual force results at R_{n1} in local space only are:

$$\left(\mu_o \cdot \frac{q_o}{t_{QKa}} \cdot \frac{r_{xa}}{R_{n1}}\right) \cdot \left(\varepsilon_o \cdot V_{QKa} \cdot c\right) = 2.307497528991 \times 10^{-38} + 1.256184635326i \times 10^{-22}\,\text{newton} \qquad 73)$$

Note the c multiplier in the partial non-local force involving voltage expression. This does not occur for the quantum current partial non-local expression as shown below which suggests that the vector magnetic potential operates independently of local space which is characterized by the velocity limit of light, c.

$$\left(\mu_o \cdot \frac{q_o}{t_{QKa}} \cdot \frac{r_{xa}}{R_{n1}}\right) \cdot \left(\frac{q_o}{t_{QKa}}\right) = 7.691658429969 \times 10^{-39} + 1.256184635326i \times 10^{-22}\,\text{newton} \qquad 74)$$

Let: $\alpha' := \alpha \cdot 1 \cdot \left(\frac{\text{sec}}{\text{m}}\right)^{2}$ where also: $\frac{1}{\alpha'} = 1.370359894933 \times 10^{2}\,\frac{\text{m}^2}{\text{sec}^2}$ 75)

Then for the classic local space electric force converted to the same magnitude of magnetic force:

$$F_{ERn1} := \frac{q_o^{2}}{4 \cdot \pi \cdot \varepsilon_o \cdot c^{2} \cdot \alpha' \cdot R_{n1}^{2}} \qquad F_{ERn1} = 1.256184632683 \times 10^{-22}\,\text{newton} \qquad 76)$$

Note that a special form of $1/\alpha$ as well as $1/c^2$ is used to be able to calculate the electric force equal to the magnetic force at R_{n1}. The velocity of light c is again eliminated if we use the magnetic form as:

$$F_{MRn1} := \frac{\mu_o \cdot q_o^{\,2}}{4 \cdot \pi \cdot \alpha' \cdot R_{n1}^{\,2}} \qquad F_{MRn1} = 1.256184632683 \times 10^{-22}\,\text{newton} \qquad 77)$$

If we derive frequency = $1/T_{fund}$ related to Heisenberg's uncertainty principle E x T = h for α' inverted, a fundamental frequency in the typical frequency range of Tesla coil is arrived at:

$$m_e \cdot (\alpha')^{-1} \cdot T_{fund} = h \quad \text{has solution(s)} \quad \frac{h}{m_e} \cdot \alpha' \qquad 78)$$

$$T_{fund} := \frac{h}{m_e} \cdot \alpha' \qquad T_{fund} = 5.308018874002 \times 10^{-6}\,\text{s} \qquad 79)$$

$$f_{fund} := T_{fund}^{\,-1} \qquad f_{fund} = 1.883942057738 \times 10^{5}\,\text{Hz} \quad \text{(= Tesla Main Frequency?)} \qquad 80)$$

$$\lambda_{fund} := \frac{c}{f_{fund}} \qquad \lambda_{fund} = 1.591304025347 \times 10^{3}\,\text{m} \qquad 81)$$

$$\text{Quarter wave} = \frac{\lambda_{fund}}{4} = 3.978260063368 \times 10^{2}\,\text{m} \qquad 82)$$

Recalling that the <u>field mass</u> (eq. 17) at R_{n1} is:

$$me_{field} := \frac{\mu_o \cdot q_o^{\,2}}{4 \cdot \pi \cdot R_{n1}} \qquad me_{field} = 4.850874070505 \times 10^{-35}\,\text{kg}$$

Then the electrogravitational equation involving field mass in the standing-wave field is given by:

$$FG_{mfield} := \frac{me_{field}}{\alpha' \cdot R_{n1}} \cdot \mu_o \cdot \frac{me_{field}}{\alpha' \cdot R_{n1}} \qquad 83)$$

$$FG_{mfield} = 1.982973070375 \times 10^{-50}\,\text{newton} \cdot \frac{\text{henry}}{\text{m}} \cdot \text{newton}$$

The above result agrees with previous EG calculations.

$$v_{mfield} := \sqrt{\frac{h \cdot f_{fund}}{me_{field}}} \qquad v_{mfield} = 1.604175800624 \times 10^{3}\,\frac{\text{m}}{\text{s}} \qquad 84)$$

$$\lambda_{mfield} := \frac{h}{me_{field} \cdot v_{mfield}} \qquad \lambda_{mfield} = 8.514995426929 \times 10^{-3}\,\text{m} \quad = \lambda_{LM} \qquad 85)$$

This new method involving $1/\alpha'$ yields a new fundamental EG velocity higher than V_{LM} but still related to the fine structure constant.

$$\frac{\mu_o}{(\alpha')^2} = 1.877886241642 \times 10^4 \frac{m^4}{s^4} \mu_o$$ Note: Seivert (Sv) is radiation dose units, 86)

Sv = sec^2/m^2. $(G\,equiv)$

Check: $$\frac{v_{mfield}}{\lambda_{mfield}} = 1.883942057738 \times 10^5\,\text{Hz}$$ = eq. 80 above. 87)

The electrogravitational equation for photon to photon f_{fund} energy involving radiation interaction at a distance equal to R_{n1} is:

$$f_{fund} = 1.883942057738 \times 10^5\,\text{Hz}$$

$$FG_{photon} := \frac{\left(h \cdot f_{fund} \cdot \alpha^2\right)}{R_{n1}} \cdot \mu_o \cdot \frac{\left(h \cdot f_{fund} \cdot \alpha^2\right)}{R_{n1}}$$ 88)

$$FG_{photon} = 1.982973080415 \times 10^{-50}\,\text{newton} \cdot \frac{\text{henry}}{\text{m}} \cdot \text{newton}$$

Where, $$f_{fund} \cdot \alpha^2 = 1.00322480455 \times 10^1\,\text{Hz}$$ = f_{LM}, the primary electrogrgravitational quantum least energy frequency. 89)

$$f_{LM} = 1.003224805 \times 10^1\,\text{Hz}$$

$$\alpha = 7.29735308 \times 10^{-3} \qquad \alpha' = 7.29735308 \times 10^{-3}\,\frac{s^2}{m^2}$$

The equation for FG_{photon} utilizes the α fine structure constant instead of α' since energy is expressed by E = hf and therefore the meter^2/sec^2 units of α' are not relevant but the pure ratio involved with α is.

New expressions related to the fundamental electrogravitational frequency and velocity are:

$$FG_{LM} := \frac{m_e \cdot \alpha^2}{\alpha' \cdot h} \qquad FG_{LM} = 1.00322480455 \times 10^1\,\text{Hz}$$ 90)

$$VG_{LM} := \sqrt{\frac{\alpha^2}{\alpha'}} \qquad VG_{LM} = 8.542454612112 \times 10^{-2}\,\frac{m}{s} \qquad v_{LM} = 8.542454615792 \times 10^{-2}\,\frac{m}{s}$$ 91)

The above expressions involve both the mass and energy forms of alpha prime and alpha respectively. It is therefore postulated that the constant related to α' may arise from the fact that mass without uncertainty in position and velocity does not exist in nature. This parallels my earlier postulate that there is no such thing as a static field. Both postulates are based on Heisenberg's uncertainty principle.

Let us solve for the radius associated with the inertial form of force as shown below:

$$r_{inertial} := \frac{m_e \cdot \alpha^2}{F_{QK} \cdot \alpha'} \qquad r_{inertial} = -2.242446136051 \times 10^{-16} m \qquad 92)$$

Concerning the above, eq. 57 and 58 gave the radius lengths associated with A-vector action distance r_x as:

$$|r_{xa}| = 2.242446135091 \times 10^{-16} m \qquad \text{where,} \qquad \frac{l_q}{4 \cdot \pi} = 2.242446133795 \times 10^{-16} m \qquad 93)$$

$$|r_{xb}| = 2.242446135091 \times 10^{-16} m \qquad 94)$$

Geometric Compton ratio of the electron field energy to rest mass energy derivation of the fine structure constant, α :

The Compton radius of the electron is: $r_{ec} := 3.861593223 \cdot 10^{-13} \cdot m$

The field energy at the surface of the electron is:

$$E_{ec} := \frac{q_o^2}{4 \cdot \pi \cdot \varepsilon_o \cdot r_{ec}} \qquad E_{ec} = 5.974424082203 \times 10^{-16} joule \qquad 95)$$

The rest mass energy of the electron is:

$$E_{me} := m_e \cdot c^2 \qquad E_{me} = 8.187111168007 \times 10^{-14} joule \qquad 96)$$

$$\frac{E_{ec}}{E_{me}} = 7.297353070702 \times 10^{-3} \qquad \text{where,} \qquad \alpha = 7.29735308 \times 10^{-3} \qquad 97)$$

Thus, the pure ratio represented by α may be represented by the ratio of energy in its fundamental form of electric field energy to the rest mass energy at the Compton wavelength of a particle. In contrast, the nature of α' in sec^2/m^2 may arise naturally as the inverse of a least quantum velocity associated with all matter at the quantum particle level and may be expected to exist even at zero degrees Kelvin. It is expected to exist via the ubiquitous presence throughout all of space of the force constant F_{QK} which is also associated with non-local energy space. Some may call what I propose concerning α' as being closely related to a contemporary concept of "zero-point energy".

In a 1 kilogram mass, the total electrogravitational energy related to the 1 kg mass is:

$$Ma := 1 \cdot 10^0 \cdot kg \qquad E_M := Ma \cdot VG_{LM}^2 \qquad E_M = 7.29735308 \times 10^{-3} joule \qquad 98)$$

The above energy is the aggregate sum of individual particle energies in the 1 kg mass. The fundamental electrogravitational particle energy determines the energy level of interaction at the individual particle level and therefore the aggregate total mass does not figure into the proper DeBroglie wavelength or Compton frequency regarding electrogravitational action. A common mistake in contemporary textbooks is to assume non-coherent bulk mass has having a corresponding single coherent DeBroglie wavelength.

A-vector fundamentally related to lq/4π and Φo:

Note:

A vector units: $1 \cdot \frac{volt \cdot sec}{m} = 1 \times 10^{0} \frac{newton}{amp}$ where: $1 \cdot volt \cdot sec = 1 \times 10^{0} weber$

Therefore: (Note the 2·Φ_o below which results from an electron in superposition with itself.)

$$A_{olqa} := \frac{2 \cdot \Phi_o}{(r_{xa})} \quad \text{Then:} \quad A_{olqa} = -3.387751476969 \times 10^{-15} + 1.844266916954i \times 10^{1} \frac{volt \cdot sec}{m} \qquad 99)$$

$$A_{olqb} := \frac{2 \cdot \Phi_o}{(r_{xb})} \quad \text{Then:} \quad A_{olqb} = 3.387751476969 \times 10^{-15} - 1.844266916954i \times 10^{1} \frac{volt \cdot sec}{m} \qquad 100)$$

Where: $\frac{l_q}{4 \cdot \pi} = 2.242446133795 \times 10^{-16} m$ and $|r_{xa}| = 2.242446135091 \times 10^{-16} m$

It is of interest that $|r_{xa}|$ or $|r_{xb}|$ is a radius only slightly larger that the Compton radius of the proton.

$$|r_{xa}| = 2.242446135091 \times 10^{-16} m$$

$$|r_{xb}| = 2.242446135091 \times 10^{-16} m$$

and, $$\frac{\lambda_p}{2 \cdot \pi} = 2.103089365342 \times 10^{-16} m \qquad 101)$$

where the difference in radius is: $$|r_{xa}| - \frac{\lambda_p}{4 \cdot \pi} = 1.19090145242 \times 10^{-16} m \qquad 102$$

The above difference in radius is less than the radius of the proton and may form a shell of repulsive force around the proton that is only present very near to the proton surface. This could be extended in principle to all larger nuclei formed by protons and neutrons.

The force constant F_{QK} can be utilized along with the fundamental A-Vector A_{olq} value above as well as the S.I. values of quantum magnetic flux Φ_o and the classic value of the electron radius lq divided by 4π to obtain a fundamental time as shown below.

$$t_{Aolqa} := \frac{(q_o \cdot A_{olqa})}{F_{QK}} \qquad t_{Aolqa} = 1.831004889932 \times 10^{-17} - 9.967855570986i \times 10^{-2} s \qquad 103)$$

$$f_{Aolqa} := t_{Aolqa}^{-1} \qquad f_{Aolqa} = 2.841884300979 \times 10^{-15} + 1.003224808865i \times 10^{1} Hz \qquad 104)$$

$$t_{Aolqb} := \frac{(q_o \cdot A_{olqb})}{F_{QK}} \qquad t_{Aolqb} = -1.831004889932 \times 10^{-17} + 9.967855570986i \times 10^{-2} s \qquad 105)$$

$$f_{Aolqb} := t_{Aolqb}^{-1} \qquad f_{Aolqb} = -1.613328825731 \times 10^{-15} - 1.003224808865i \times 10^{1} Hz \qquad 106)$$

The imaginary part of eqs. 104 and 105 above give a frequency result that is equivalent to the previously stated electrogravitational frequency fLM on p. i at the beginning of this paper.

Where: $f_{LM} = 1.003224805 \times 10^{1}$ Hz

The frequency results of eqs. 104 and 106 above are symmetrical, going both forward and backwards in time as expected for the quantum case of quantum particle electrogravitational field action. The action is not causal in the present day tense of the word since the time for the electrogravitational action is effectively instantaneous. Again, if physics is going to unite the gravitational mechanics with the other force fields, we must be able to think outside the light cone.

All particle light cones and their respective neighborhoods are instantaneously connected through the particle centers to all other particles throughout the universe. The force constant F_{QK} is the gate through non-local energy space and connects local space to non-local space.

The thought occurred to me recently that present day physics, with its convoluted string theory and simultaneous differential equations of general relativity, have tied up in knots progress into uniting the gravitational field with the rest of the force fields of nature. The following is a quote concerning how Alexander The Great solved the problem of the Gordian Knot: *"Making his way to the acropolis , Alexander was followed by a great crowd. Anxious, they gathered to see the great king struggle with their famed puzzle as all had before him. The townspeople were not disappointed. For nearly two hours Alex racked his brain for a solution. Finally, in a fit of frustration he asked of his advisors, "What does it matter how I loose it?" He drew his sword and, in a single spinning flourish, sliced the Gordian Knot open to reveal the ends hidden inside."* [2]

I see the quantum sharp edge of the sword of electrogravitation cleaving apart the present day knotted up physics theory so that bits of string-theory fly out in all directions to lay on the ground as nest building material for the birds. After that, the quantum sharp point of the sword of electrogravity, emblazoned on its sides with the word **Truth,** will poke a hole into the "fabric of space" convoluted hot air bladder in the center of what was the knot and it will be evident to all that the curved space was not the true solution at all, and all the people will say, "How could we have been fooled so easily into thinking that this knotted up mess was so important?"

It should be evident to even the most casual observer that present day physics is bent on leading research and researchers into blind alleys by use of misleading theory based on the premise that action cannot occur faster than the velocity of light. **Truth** will prevail.

--Jerry E. Bayles--

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