Energy Scaling Of The Universe and Free Energy From The Transform Of Heisenbergs Uncertainty Equation of Wavelength Into His Uncertainty Equation For Energy Via Time Perturbation Of The Quantum Circulation Constant

by

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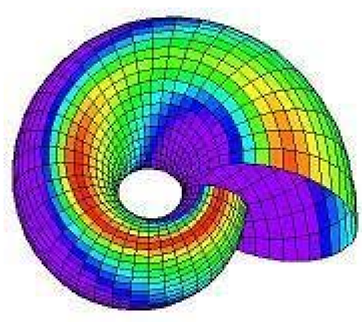


Introduction

This paper started out as a scaling project to connect quantum wavelengths and time to the dimension of the universe and one thing most certainly led to another as time went by. The reader will encounter the dynamics of spinning energy fields that generate force along the axis of rotation and unlock the secrets of the Great Pyramid at Giza. We will see the fine structure constant at work in its construction as well as exact dimensional correlation with quantum aspects of nature. The quantum circulation constant will be unlocked for its ability to connect us to the free energy domain of energy space.

It is hoped that the reader will be prompted to explore alternative avenues of science as I have but always keeping in mind the basic constructs that have been proven over time. This will ensure that a good foundation exists even though the research may lead into areas that conventional thinking says we should not delve into. I wish you all good exploring!

The scaling of the universe from the geometry of the microscopic

Initializing statement of parameters and constants:

$c := 2.997924580 \cdot 10^{08} \cdot m \cdot sec^{-1}$ Free space velocity of light

$v_{LM} := 8.542454612 \cdot 10^{-02} \cdot m \cdot sec^{-1}$ Electrogravitational least quantum velocity

$\lambda_{LM} := 8.514995416 \cdot 10^{-03} \cdot m$ Electrogravitational least quantum wavelength

$f_{LM} := 1.003224805 \cdot 10^{01} \cdot Hz$ Electrogravitational least quantum frequency

$\lambda_e := 2.426310580 \cdot 10^{-12} \cdot m$ Compton wavelength of the electron

$l_q := 2.817940920 \cdot 10^{-15} \cdot m$ Classical electron radius

$\alpha := 7.297353080 \cdot 10^{-03}$ Fine Structure Constant

$c_q := 1 \cdot m^2 \cdot sec^{-1}$ Least quantum of circulation (rationalized)

Let the number of turns or cycles of rotation per electron wavelength λ_e in the least quantum electrogravitational wavelength λ_{LM} be found.

$t_u := \lambda_{LM} \cdot \lambda_e^{-1}$ $t_u = 3.50944165442 \times 10^9$ turns 1)

Now let the next distance or wavelength be found as:

$\lambda_a := t_u \cdot \lambda_{LM}$ $\lambda_a = 2.98828796001 \times 10^7 \, m$ 2)

where: $\frac{c}{\lambda_a} = 1.00322479631 \times 10^1 \, Hz$ which equals f_{LM} above. 3)

The next higher wavelength is found to be:

$\lambda_b := \lambda_a \cdot t_u$ $\lambda_b = 1.04872222422 \times 10^{17} \, m$ 4)

where: $\left(\frac{c^2}{v_{LM}}\right) \cdot \frac{1}{\lambda_b} = 1.00322478807 \times 10^1 \, Hz$ which is the phase velocity related to the group velocity v_{LM} divided by λ_b and the result also equals f_{LM}. 5)

The phase velocity is: $v_p := \frac{c^2}{v_{LM}}$ $v_p = 1.05210413114 \times 10^{18} \frac{m}{s}$ 6}

The characteristics of quantum wavelengths apply as if particles interactions were modeled by circular **waveguide geometry**.[1]

Finally, the wavelength of the universe is found as:

$\lambda_c := t_u \cdot \lambda_b$ and the diameter is: $\frac{\lambda_c}{\pi} = 1.17151708176 \times 10^{26} m$ 7)

The scaling of the universe is then shown to fit the above method by utilizing the wavelengths of the electrogravitational least quantum wavelength divided by the Compton wavelength of the electron as a scaling tool. Further, the turns per meter is also useful.

$t_{um} := t_u \cdot \lambda_{LM}^{-1}$ $t_{um} = 4.12148390335 \times 10^{11} \frac{1}{m}$ turns/meter. 8)

The fundamental **electromagnetic** frequency related to quantum electrogravitation is found to be:

$f_{gem} := c \cdot \lambda_{LM}^{-1}$ $f_{gem} = 3.52075888892 \times 10^{10} Hz$ 9)

The turns per meter divided by the fundamental electrogravitational frequency yields a parameter that is fundamental to both the electrogravitational and electromagnetic results as shown above.

$tm_{geq} := t_{um} \cdot f_{gem}^{-1}$ $tm_{geq} = 1.17062373011 \times 10^{1} \frac{s}{m}$ 10)

The inverse of the above is the least quantum electrogravitational velocity v_{LM}. The tm_{geq} term times the rationalized least quantum of circulation c_q yields a quarter wavelength along the Grand Gallery of the Great Pyramid located at Giza in Egypt.

$tm_{geq} \cdot c_q = 1.17062373011 \times 10^{1} m$ (= 1/sqrt α in meter units.) 11)

$tm_{geq} \cdot c_q \cdot 4 = 1.53625161431 \times 10^{2} ft$ Equals the length of the Grand Gallery.[2] 12)

The actual S.I. value of the established **least quantum of circulation** may be derived by the two methods shown below. Note that the fine structure constant is assigned the units of meters squared per second squared which is established in previous works by this electrogravitational mechanic.[2]

$\frac{1}{f_{LM}} \cdot \left(\alpha \cdot \frac{m^2}{s^2} \right) = 7.27389618322 \times 10^{-4} \frac{m^2}{s}$ and $c \cdot \lambda_e = 7.2738961265 \times 10^{-4} \frac{m^2}{s}$ 13)

The formula for inductance is given as: $$L = \frac{\mu_o \cdot n^2 \cdot A}{lngth}$$ 14)

where n is the total number of turns along the coil, μ_o is the magnetic permeability of free space, A is the radius squared and lngth is the length of the turns along the coil. If we establish the inductance L as equal to the quantum ohm divided by the fundamental least quantum electrogravitational frequency f_{LM} and also state the fundamental wavelength r_{H1} (now termed λ_{H1}) related to previous solutions of the wavelength of the n1 Hydrogen atom involving the hyperfine frequency of 1.420 GHz and the natural number e, we can solve for length, denoted as lngth.

$R_H := 2.581280560 \cdot 10^{04} \cdot ohm$ $\quad \mu_o := 4 \cdot \pi \cdot 1 \cdot 10^{-07} \cdot henry \cdot m^{-1}$ $\quad m_e := 9.109389700 \cdot 10^{-31} \cdot kg$

$L_Q := R_H \cdot f_{LM}^{-1}$ $\quad L_Q = 2.57298319094 \times 10^{3}\, henry$ $\quad h := 6.626075500 \cdot 10^{-34} \cdot joule \cdot sec$ 15)

$\lambda_{H1} := 9.03806611453 \times 10^{-10}\, m$ where also, $\frac{\lambda_e \cdot e}{\alpha} = 9.03806611453 \times 10^{-10}\, m$ 16)

which is the Bohr λ times e of the n1 energy level of the H1 atom. Then Solving for lngth:

$L_Q = \frac{\mu_o \cdot t_u^2 \cdot \lambda_{H1}^2}{lngth}$ has solution(s) $\mu_o \cdot t_u^2 \cdot \frac{\lambda_{H1}^2}{L_Q}$ And: $e = 2.71828182846 \times 10^{0}$ 17)

$lngth := \mu_o \cdot t_u^2 \cdot \frac{\lambda_{H1}^2}{L_Q}$ $\quad lngth = 4.91360222662 \times 10^{-9}\, m$ $\quad \frac{\lambda_e \cdot 2 \cdot e^2}{\alpha} = 4.91360217671 \times 10^{-9}\, m$

Next we solve for the velocity v_{lngth} where h is Planks constant. Let lngth be a wavelength since the coil may be closed to form a torus. Let m_e be the rest mass of the electron.

$v_{lngth} := \frac{h}{m_e \cdot lngth}$ $\quad v_{lngth} = 1.48035918477 \times 10^{5}\, \frac{m}{s}$ 18)

$f_{lngth} := \frac{v_{lngth}}{lngth}$ $\quad f_{lngth} = 3.01277782876 \times 10^{13}\, Hz$ This frequency is very close to key EG/EM interaction points[3] 19)

NOTE: f_{H1} = Lower limit of ultra violet light.

$v_{H1} := \frac{h}{m_e \cdot \lambda_{H1}}$ $\quad v_{H1} = 8.04806702486 \times 10^{5}\, \frac{m}{s}$ $\quad f_{H1} := v_{H1} \cdot \lambda_{H1}^{-1}$ $\quad f_{H1} = 8.90463393703 \times 10^{14}\, Hz$

$f_{H1} \cdot e^2 = 6.57968397011 \times 10^{15}\, Hz$ where, $m_e \cdot (c \cdot \alpha)^2 \cdot h^{-1} = 6.57968386159 \times 10^{15}\, Hz$

= H1n1 energy level frequency.

$\frac{f_{H1}}{f_{lngth} \cdot (2e)^2} = 1.00000002032 \times 10^{0}$ $\quad \frac{f_{H1}}{f_{lngth} \cdot e^2 \cdot \pi \cdot \left(\frac{4}{\pi}\right)} = 1.00000002032 \times 10^{0}$

Where also:

$$f_{lngth}\cdot\frac{\alpha}{2\cdot\pi} = 3.49906973823\times10^{10}\,Hz \qquad \text{where,} \qquad f_{gem} = 3.52075888892\times10^{10}\,Hz \qquad 20)$$

Note that: $$\frac{lngth}{\lambda_{H1}\cdot2\cdot e} = 1.00000001016\times10^{0}$$ Then there are established energy levels above H1n1 based on multiples of e which are related directly to the EG force constant. 21)

Let quantum charge be set at: $q_o := 1.602177330\cdot10^{-19}\cdot coul$ = electron charge SI.

The least quantum electrogravitational **(EG) force constant F_{QG}** is stated as:

$$F_{QG} := \frac{\left[\left(q_o\cdot f_{LM}\right)\cdot\lambda_{LM}\right]}{l_q}\cdot\mu_o\cdot\frac{\left[\left(q_o\cdot f_{LM}\right)\cdot\lambda_{LM}\right]}{l_q} \qquad F_{QG} = 2.96437145031\times10^{-17}\,newton \qquad 22)$$

A fundamental frequency f_{QG} is found as: 23)

$$F_{QG} = \frac{\left[\left(q_o\cdot f_{QG}\right)\cdot lngth\right]}{lngth}\cdot\mu_o\cdot\frac{\left[\left(q_o\cdot f_{QG}\right)\cdot lngth\right]}{lngth}$$

has solution(s)

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

where l_q is replaced by lngth:

$$f_{FQG} := \frac{1}{\mu_o}\cdot\left(\mu_o\cdot F_{QG}\right)^{\frac{1}{2}}\cdot\frac{1}{q_o} \qquad f_{FQG} = 3.03145270192\times10^{13}\,Hz$$

which is an **exact key frequency of the electrogravitational/electromagnetic interface** and is very close to the f_{lngth} of the coil solution in eq. 19 above. $f_{lngth} = 3.01277782876\times10^{13}\,Hz$

The + and - solutions are both allowed since + and - time (t = 1/f) occur according to quantum mechanics as shown by Feynman diagrams. Gravity repulsion is possible if traveling backwards in time for one f_{QG} and forwards in time for the other as shown by the F_{QG} equation above.

Note that f_{gem} and f_{FQG} are related as: where, $f_{FQG} = 3.03145270192\times10^{13}\,Hz$

$$\frac{f_{FQG}\cdot\alpha}{2\cdot\pi\cdot\left(f_{gem}\right)} = 1.0000000086\times10^{0} \qquad \text{and} \qquad f_{gem} = 3.52075888892\times10^{10}\,Hz \qquad 24)$$

A constant quantum force infers that there is no such thing as an isolated system. All matter in the universe is instantly interconnected regardless of distance of separation. A restoration of energy from energy space to F_{QG} is also implied if energy is extracted. This may be a source of limitless clean energy at f_{FQG} .

The temperature related to f_{FQG} is found as follows:

First, Boltzman's constant is: $k_B := 1.380658000 \cdot 10^{-23} \cdot \frac{joule}{K}$

$E_{fFQG} := h \cdot f_{FQG}$ Let us solve for the temperature T_k in the below equation. 25)

$E_{fFQG} = \frac{3 \cdot \pi}{2} \cdot k_B \cdot T_k$ has solution(s) $\frac{2}{3} \cdot \frac{E_{fFQG}}{\pi \cdot k_B}$

$T_k := \frac{2}{3} \cdot \frac{E_{fFQG}}{\pi \cdot k_B}$ $T_k = 3.08730780753 \times 10^2 K$ (Close to room temperature.) 26)

$T_C := 3.06558875798 \times 10^2 - 273$ $T_C = 3.3558875798 \times 10^1$ degrees Centigrade. 27)

$T_F := \frac{9}{5} \cdot T_C + 32$ $T_F = 9.24059764364 \times 10^1$ degrees Fahrenheit 28)

The volts/meter related to the force constant yields a substantial power.

$E_V := F_{QG} \cdot q_o^{-1}$ $E_V = 1.85021432697 \times 10^2 \frac{volt}{m}$ Close to actual surface field potential of the Earth. 29)

$B := (c \cdot \alpha)^{-1} \cdot E_V$ $B = 8.45738257602 \times 10^{-5}$ tesla Close to the measured B field of the Earth. 30)

The Poynting power derived from E_V and B is:

$S := E_V \cdot B \cdot (2 \cdot \mu_o)^{-1}$ $S = 6.22612960059 \times 10^3 \frac{kg}{s^3}$ or, $S = 6.22612960059 \times 10^0 \frac{kW}{m^2}$ 31)

The power flow can be applied to the Grand Gallery in the Great Pyramid. Normally, E and B are vectors 90 degrees to each other for maximum power flow and the power flows 90 degrees to both E and B. The E vector can be vertical, the B vector can be visualized as 90 degrees to the E vector and circulating the E vector, and the power flow is then along a north-south line in both directions and can be considered to be a standing wave. By altering the line loss from being a perfect conductor, a net flow in one direction or the other can be achieved. That is, the power transmitted does not cancel the power reflected and therefore there is a net power flow along the north-south direction. There are critical lengths along the grand gallery, such as the total length of the grand gallery, which is one wavelength at 7.83 Hz if the air temperature is 144 degrees for a velocity of 1206 ft/sec through the air.

The air temperature may well rise to 144 degrees in an enclosed working environment such as a power generator might experience. Also, the distance between the resonators[2] is 5.485 feet which yields a frequency of 219.14 Hz which is 1/2 the acoustic resonance of the Kings Chamber of 438.3 Hz.

The length of one side of the Great Pyramid is 755.733 feet. That is equal to 230.347 meters. Squaring the sides, we arrive at:

$$GP_{Area} := (230.347 \cdot m)^2 \qquad GP_{Area} = 5.3059740409 \times 10^4 \, m^2 \qquad 32)$$

Multiply this area times the Poynting power calculated for 1 square meter:

$$S_{GP} := GP_{Area} \cdot S \qquad \boxed{S_{GP} = 3.3035682036 \times 10^8 \, watt} \qquad 33)$$

That is **330 megawatts** which is comparable to large commercial power generators of today. That is also the actual power available from the Earth's ambient pulsating electric and magnetic fields at at the base of the Great Pyramid on the surface of the Earth. A pyramid is an ideal shape to focus this power to a central collector namely, the King's Chamber. Note that the upper end of the Grand Gallery which feeds the energy into the King's Chamber is nearly exactly at a line drawn from the top of the pyramid to its base.

The field mass m_{Shu} in S above can be calculated for the Shumann frequency of 7.83 Hz.

$f_{Shu} := 7.83 \cdot Hz$ **The field mass m_{Shu} below (eq. 34) <u>is inversely proportional to frequency</u>^{3}.**

$S = 6.22612960059 \times 10^3 \left(kg \cdot f_{Shu}^{\,3}\right)$ has kg solution(s) $1.6061342505707527823 \cdot 10^{-4} \cdot \dfrac{S}{f_{Shu}^{\,3}}$

$$m_{Shu} := 1.6061342505707527823 \cdot 10^{-4} \cdot \frac{S}{f_{Shu}^{\,3}} \quad \text{or,} \quad \boxed{m_{Shu} = 2.08312203966 \times 10^{-3} \, kg} \qquad 34)$$

(= relative mass in the ambient field in one square meter at 7.83 Hz.)

Check:

$$m_{Shu} \cdot \left(f_{Shu}^{\,3}\right) \cdot \left(6.22612960059 \times 10^3\right) = 6.22612960059 \times 10^3 \, \frac{kg}{s^3} \quad \text{/here,} \quad S = 6.22612960059 \times 10^3 \, \frac{kg}{s^3}$$

$$Pyr_{fldmass} := GP_{Area} \cdot \left(m_{Shu} \cdot m^{-2}\right) \qquad Pyr_{fldmass} = 1.10529914665 \times 10^2 \, kg \qquad 35)$$

Treating the field mass as a standing wave and then causing a net flow in a particular direction by adjusting the line loss, a directional force field resulting in a net thrust is possible.

The same directional mass field can be applied to a flying saucer geometry. The top and bottom of the saucer are the open circuit high voltage termination points and the rim becomes the short circuit high current point. The regeneration feed is a circular waveguide running from the top of the craft through a central floor area. Here we can visualize standing waves of power flow that are more in one direction along the surface from top to bottom than in the other direction. This amounts to a motion of the mass field which provides thrust along the central axis. This is also based on the lossy transmission line principle. Thus, the asymmetrical mass flow provides thrust.

The source for this power flow must be derived from the force constant F_{OG} as shown above. The appropriate frequency and wavelength parameters are used to interface to the force constant geometry. The force constant must remain a force constant and therefore extracting energy from it causes energy to be input from energy space to maintain the force a constant. Allowing the standing waves at the surface of the saucer to encounter a low loss surface causes a spiral and decaying field effect from the top of the saucer to the rim. This in itself may induce energy from energy space to replace the energy dissipated at the lossy surface. The magnetic field circles the vertical axis as the field moves towards the saucer rim and the electric field stretches from the top of the saucer to the rim. The E and B field cross-product directs the mass-field outwards from the top of the saucer and inwards towards the bottom due to the E and B field direction being reversed at the bottom. The E and B field may cross each other at an angle corresponding to the atan of $4/\pi$ as in the case of the Great Pyramid operation. The universe is therefore expanding since random action and interaction at the appropriate wavelength and frequency with the force constant will cause energy to be input to normal space. Thus, the energy in space is found to be much greater than was originally assumed. The surface of the saucer may be an alloy of magnetic materials with nonmagnetic materials to provide both the lossy surface as well as provide the proper transmission velocity that will interface to energy space. For example, from above:

$v_{lngth} = 1.480359184777 \times 10^{5} \frac{m}{s}$ Some of the induced energy may be utilized for the regeneration waveguide operation and to power control and habitat needs. Since the force constant is ubiquitous throughout the universe, this type of operation will allow for space travel anywhere from a power source that is independent of the craft or even of normal space-time.

The 'waveguide' may be circular and as such the E field is directed from the waveguide axis to the encircling pipe while the B field rotates around the axis of the waveguide and 90 degrees to the E field. Thus power flows along the axis towards the top of the craft where a rod at the top emits the field to the surface of the craft. Making the rod length adjustable fine tunes the system for maximum power. As for defense, the field itself serves as a mass projector. Also, the field could be used to lift heavy objects at a distance, perhaps even 200 ton granite stones to build the Great Pyramid which operated on much the same principles as flying saucers.

The next page begins a copy from an ebook called "Visual Electromagnetics For Mathcad" and is included for demonstrating how asymmetrical power flow can be achieved via a low loss transmission path. The ebook will only work if you have Mathcad 2001i or newer installed on your computer. Otherwise, it serves as an example of how to calculate the same utilizing other methods.

Section 7.4 and Problem 7.4.2

Voltage Variation and Power Flow on a Low-Loss Transmission Line

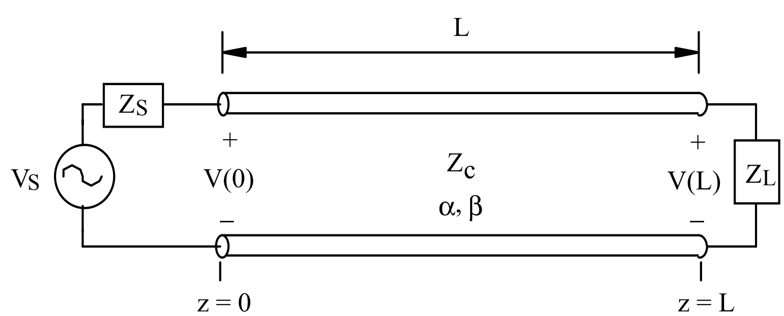
Purpose

To compute the time-average power delivered both to the input and to an impedance load that is attached to a low-loss transmission line (TL). Using the given Z_C, α and β paramete of the TL, the conditions for low-loss are first verified. Next, the time- average power at th input and load terminals are computed. Finally, plots of the phasor magnitude and time-animated voltage along the TL are generated. The effects of loss on this voltage is identified by the attenuated nature of the voltage along the TL.

Enter parameters

The transmission line (TL) is assumed to have the arrangement for the source and the load as shown below. Also, this TL is assumed to have only small losses.

Fig. 1



Choose the parameters for the TL including the length, characteristic impedance and the phase and attenuation constants:

$L := 7.$ — Length of the TL (m).

$Z_C := 75 + j\cdot 0$ — TL characteristic impedance (Ω).

$\beta := 3$ — Phase constant (rad/m).

$\alpha := 0.02$ — Attenuation constant (Np/m). (*Note*: α must be "small" for a low-loss TL. See next subsection for details.)

The propagation constant is then from (138) in Chap. 7 of the text:

$\gamma := \alpha + j\cdot\beta$

Now choose the parameters for the source and the load:

$V_S := 10\cdot\exp(j\cdot 0\cdot \mathrm{deg})$ Source open-circuit voltage (V).

$f := 100\cdot 10^6$ Source frequency (Hz).

$Z_S := 75 + j\cdot 0$ Source impedance (Ω).

$Z_L := 150 + j\cdot 0$ Load impedance (Ω).

Check low-loss condition

From (154) and (156) in Chap. 7 of the text, a low-loss TL is characterized by a propagation constant, γ, that is complex but with a characteristic impedance, Z_C, that is purely real. From the statement of Prob. 7.4.2 we have some indication – from the purely real nature of Z_C – that the given transmission line falls into the category of "low-loss" TLs as discussed in Section 7.4 of the text.

Here we will verify that the low-loss condition is indeed satisfied. Using Equations (136), (138) and (139) in Chap. 7 of the text it can be shown that:

$Z := Z_C\cdot\gamma$ $Z = 1.500 + 225.000i$ Per-unit-length impedance (Ω/m). 36)

$Y := \frac{\gamma^2}{Z}$ $Y = 2.667\times 10^{-4} + 0.040i$ Per-unit-length admittance (S/m). 37)

where Z and Y are defined in (136) as $Z = r + j\omega l$ and $Y = g + j\omega c$.

As discussed in Section 7.4 of the text, a low-loss TL is defined as one where $r \ll \omega l$ and $g \ll \omega c$. Computing the ratios of the imaginary and real parts of Z and Y gives:

$\frac{\mathrm{Im}(Z)}{\mathrm{Re}(Z)} = 1.5\times 10^2$ $\frac{\mathrm{Im}(Y)}{\mathrm{Re}(Y)} = 1.5\times 10^2$ 38)

Provided both of the ratios are *large* (that is, much greater than one), the low-loss transmission line model will be quite accurate.

Two requested tasks in Prob. 7.4.2 are to determine the time-average power delivered to the input of the transmission line and to the load. Towards that end, we will first compute the voltage everywhere on the TL. Using Equation (66) in Chap. 7 of the text, the voltage reflection coefficient at the load is:

$$\Gamma_L := \frac{Z_L - Z_C}{Z_L + Z_C} \qquad \Gamma_L = 0.333$$ Load reflection coefficient. 39)

For a lossy transmission line, the (generalized) voltage reflection coefficient is given in (146) of Chap. 7 as:

$$\Gamma(z) := \Gamma_L \cdot \exp[2 \cdot \gamma \cdot (z - L)]$$ 40)

such that the input impedance looking into the TL at z = 0 is then from (144) of Chap. 7:

$$Z_{in} := Z_C \cdot \frac{1 + \Gamma(0)}{1 - \Gamma(0)} \qquad Z_{in} = 55.526 + 27.379i$$ (Ω) 41)

The expression for the voltage anywhere on this lossy transmission line is given in (143a) of Chap. 7 in the text:

$$V(V_{m\_plus}, z) := V_{m\_plus} \cdot \exp(-\gamma \cdot z) \cdot (1 + \Gamma(z))$$ 42)

To determine the constant V_{m_plus}, we apply the source boundary condition in a manner identical to that employed in the **Example 7.5** worksheet for the lossless transmission line. The results of this analysis are that:

$$V_{in} := \frac{Z_{in}}{Z_{in} + Z_S} \cdot V_S \qquad V_{in} = 4.49616267018 \times 10^0 + 1.15448680768i \times 10^0$$ (V) 43)

$$V_{m\_plus} := \frac{V_{in}}{1 + \Gamma(0)} \qquad V_{m\_plus} = 5.000$$ (V) 44)

where the reflection coefficient at the input to the transmission line is:

$$\Gamma(0) = -0.1008 + 0.2309i$$ TL input reflection coefficient. 45)

The time-average power delivered to the input of the transmission line can now be computed from (107) in Chap. 7 of the text as:

$$P_{in} := \frac{1}{2} \cdot \mathrm{Re}\left[\frac{\left(\left|V(V_{m\_plus}, 0)\right|\right)^2}{Z_{in}}\right] \qquad P_{in} = 0.1561$$ (W) 46)

and in a similar manner, the time-average power delivered to the load is:

$$P_{load} := \frac{1}{2} \cdot \mathrm{Re}\left[\frac{\left(\left|V\left(V_{m\_plus}, L\right)\right|\right)^2}{Z_L}\right] \qquad P_{load} = 0.1120 \qquad \text{(W)} \qquad 47)$$

We saw in the **previous worksheet** that the time-average power delivered to the input of a *lossless* TL was equal to that delivered to the load. Conversely, here we see that if α is nonzero, then these two quantities P_{in} and P_{load} do not have the same value. For if α is not zero, then the TL contains losses that will absorb some of the power carried by the wave. Consequently, not all of the time-average power input to the TL will reach the load. (As a partial confirmation of this fact, you can set α to zero at the beginning of this worksheet and see that P_{in} and P_{load} will then equal one another.)

Plot the voltage on the TL

We will now plot the magnitude of the phasor voltage everywhere on the TL. Given that the TL is lossy, we would expect to see some type of attenuation of this voltage on the TL.

Choose the number of points at which to plot the voltage along the TL:

$npts := 160$ Number of points to plot in z.

$z_{start} := 0$ $z_{end} := L$ z starting and ending points (m).

Construct a list of z_i points at which to plot the voltage:

$$i := 0 .. npts - 1 \qquad z_i := z_{start} + i \cdot \frac{z_{end} - z_{start}}{npts - 1} \tag{48}$$

Now plot the magnitude of the phasor voltage along this lossy (but "low-loss") TL:

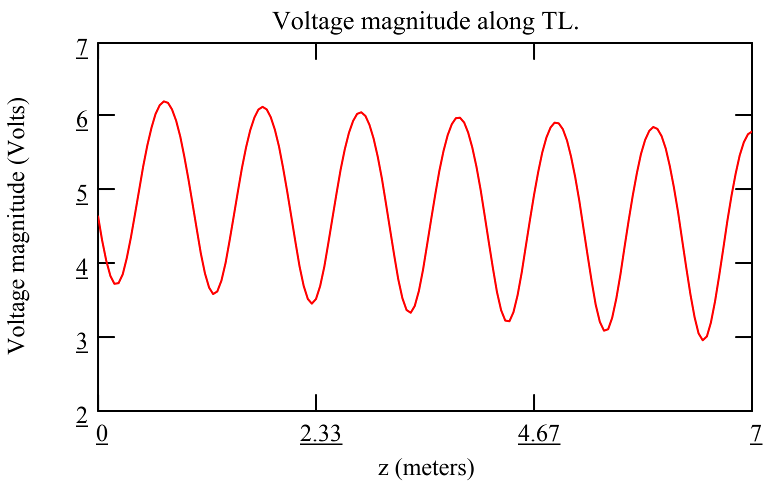


Fig. 2

For a lossy TL with

$L = 7 \times 10^{0}$ (m)

$\alpha = 2 \times 10^{-2}$ (Np/m)

$\beta = 3 \times 10^{0}$ (rad/m)

If $\alpha \neq 0$ (but is "small") it will be apparent in this plot that the voltage on the transmission line is not strictly periodic as would be expected for a long, lossless TL. Using the parameters as specified in Prob. 7.4.2, we can clearly see in this plot that the voltage is tending to decrease in amplitude farther away from the source (the source is at the left-hand end of the plot at z = 0). This decrease in the magnitude of the voltage field is a direct result of the attenuation caused by the lossy nature of the TL.

Note, however, that this voltage magnitude still has maxima and minima present. Such a behavior in the phasor-domain plot indicates the presence of **interference** between the forward (+z) and reverse (-z) propagating voltage waves.

Animated plot of the voltage on the low-loss TL

Finally, we will construct an animation clip of the voltage field on the TL. The time-domain expressions for the voltage everywhere on the transmission line can be computed from the phasor-domain form of this quantity as:

$$V_t(V_{m\_plus}, z, t) := \mathrm{Re}\left(V(V_{m\_plus}, z)\cdot \exp(j\cdot 2\cdot\pi\cdot f\cdot t)\right) \qquad 49)$$

The period of the sinusoidal voltage source is:

$$T_p := \frac{1}{f} \qquad T_p = 1\times 10^{-8} \quad \text{(s)} \qquad 50)$$

Choose the number of periods for which to plot voltage:

$n_{periods} := 2$ Number of time periods to plot.

$n_{pts\_per\_period} := 40$ Number of points to plot per period.

$t_{start} := 0$ $\quad t_{end} := n_{periods}\cdot T_p$ Time to start and end plot (s). 51)

Define the variable time in terms of the constant FRAME. $V_{max} := \left|V_{m\_plus}\cdot\left(1 + |\Gamma_L|\right)\right|$ 52)

$$t_{inc} := \frac{T_p}{n_{pts\_per\_period}} \qquad time := t_{start} + FRAME\cdot t_{inc} \qquad To := n_{pts\_per\_period}\cdot n_{periods} \qquad 53)$$

Now generate the animated plot of the voltage on the TL. For best results, in the "Animate" dialog box, choose $To = 8\times 10^{1}$

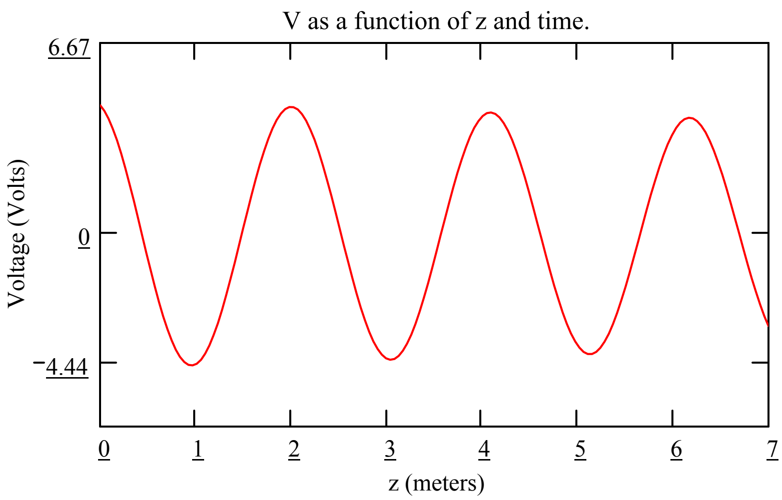


Fig. 3

Time (in periods, T_p)

$$\frac{time}{T_p} = 0.00$$

For a lossy TL with

$L = 7\times 10^{0}$ (m)

$\alpha = 2\times 10^{-2}$ (Np/m)

$\beta = 3\times 10^{0}$ (rad/m)

The source is located at the left-hand edge of this plot (z = 0) while the load is at the right- hand edge.

We observe in the animation clip that the voltage on this low-loss TL has many of the same characteristics as voltage waves on a **lossless** TL. In particular, we can see that the wave continues to propagate in the +z direction and that the wave "pulsates" as it propagates indicating that incident and reflected voltage waves are interfering along this TL.

The major difference between this low-loss TL and a lossless one is that the amplitude of the voltage wave is decreasing in magnitude as a function of distance away from the source towards the load end of the TL.

Further experimentation

For further experimentation with this worksheet, you may wish to observe the animation clip when the load is a short circuit and when the load is matched to the TL. That is, choose Z_L = 0 or Z_L = Z_C at the beginning of this worksheet and then regenerate the animation clip. The effects of losses will still be apparent in the these two animation clips, but the standing wave nature of the voltage will be very different. For Z_L = 0, note that a **perfect** standing wave (a standing wave where the minimum phasor voltage magnitude equals zero) is no longer present as with the **lossless** TL case. Can you explain why?

End of worksheet.

The animation above shows a pulsating wave that has maxima and minima as the wave travels to the right along the transmission path. The maxima and minima are due to the forward and reflective waves alternately partially reinforcing and canceling each other over time.

I remember watching a ufo prepare to take off in the early evening back in the mid 1950's and a glow started dimly around the craft and the glow pulsated and grew brighter with each pulsation. The pulsations increased in frequency and eventually the craft took off. This was in Dallesport Washington across the Columbia river from the Dalles, Oregon. The pulsation may have been due to the same action as shown by the animation clip above. The animation above has been turned into an **AVI clip** [4] for those who do not have Mathcad.

Also, I was privileged to witness a very large ufo over the town of Umatilla, Oregon and it was also witnessed by the entire population to hover there most of the day. In addition, two smaller craft left the much larger one in the early afternoon and flew zigzag patterns around the much larger one for several hours. This was about 1952. It is listed as the Hanford, Washington sighting by popular reference material. The large craft glowed very brightly while the smaller craft not as much but still very distinct. The local military aircraft from Hermiston could not reach the ufo's as they were much too high in the sky. Yet the larger one appeared to be about the size of a dime at arm's length. In the setting sun, the smaller craft joined the larger one and then in a matter of seconds, the large ufo disappeared over the horizon displaying a rainbow of colors behind it.

I mentioned above that a phase velocity as well as group velocity exist. I should add that this is generally referenced to a waveguide for electromagnetic waves and to the basic nature of quantum particles. In fact I may state that quantum particles act very much as if they can create their own waveguide through which they then transit. It is suggested therefore that superluminal action regarding quantum particle motion can occur via the transition of the particle at the phase velocity since the waveguide is a separate space from open or normal free space of the electromagnetic radiation domain. Thus a quantum particle can create its own *wormhole* as for the case of the macroscopic relativistic scenario. It is common knowledge that the phase velocity can far exceed the group velocity inside of a waveguide and the actual wavelength as measured from outside the waveguide is also much greater than expected in normal space at the velocity of light. The phase velocity times time, which is $\lambda = v_p/f$ yields a far greater distance than in normal space.

Then, if a ufo as described above is also able to generate its own spatial waveguide by mimicking quantum particle field motion, the ufo would also be able to travel at superluminal velocities inside of its own created space-time waveguide geometry. The phase velocity would be inline with the axis of the ufo where the axis is through the short distance and not through the rim. The rim is then radial to the axis. The rim slowly rotates at the group velocity while the entire craft can move at the phase velocity along the direction of its axis of rotation.

The key to quantum superluminal action is to be able to connect to the force constant via the proper frequency and wavelength. Then extraction of energy from energy space is possible since the force constant is a constant by virtue of energy extracted from it must be replaced by energy from energy space. The very surface of a ufo can be constructed so as to adjust the wave velocity and wavelength to:

$$v_{lngth} = 1.48035918477 \times 10^{5} \frac{m}{s} \quad lngth = 4.91360222662 \times 10^{-9} m \quad \frac{v_{lngth}}{lngth} = 3.01277782876 \times 10^{13} Hz$$

Suitable metal crystal structures involving magnetic compounds can doubtless provide the above parameters. Then the surface can induce energy from energy space to provide the field action described above that creates a directional (vertical) mass field flow. In the atmosphere, the air would be ionized and the craft would glow brightly if the field were strong enough. There quite likely could be a visible spiral standing wave pattern due to strong magnetic flux under some modes of operation.

Redefine: $\alpha := 7.2973553080 \cdot 10^{-03}$ as the fine structure constant, SI.

The fundamental length where (F*d)/h = v/d is: (Where v = h/m*d):

54)

$$lngth1 := \left(\frac{h^2}{F_{QG} \cdot m_e}\right)^{\frac{1}{3}} \quad lngth1 = 2.5333602517 \times 10^{-7} m \quad \frac{lngth1}{lngth \cdot \left[e \cdot \left(\frac{4}{\pi}\right)^4\right]^2} = 1.01024577638 \times 10^{0}$$

$$v_{lngth1} := \frac{h}{m_e \cdot lngth1} \qquad v_{lngth1} = 2.87124430155 \times 10^{3}\ \frac{m}{s}$$

$$f_{lngth1} := m_e \cdot v_{lngth1}^{2} \cdot h^{-1} \qquad f_{lngth1} = 1.13337386565 \times 10^{10}\ Hz$$

$$f_{H1} := 1.420405751786 \cdot 10^{09} \cdot Hz \qquad \frac{f_{lngth1}}{f_{H1}} = 7.9792261065 \times 10^{0}$$ 55)

$$\frac{lngth1 \cdot \alpha^{2} \cdot .977784015}{\lambda_e \cdot (2 \cdot e)} = 1.0000000019 \times 10^{0}$$ Let: $\lambda_{n1} := \lambda_e \cdot \alpha^{-1}$ 56)

$$\frac{lngth1 \cdot \alpha \cdot .977784015}{\lambda_{n1} \cdot (2 \cdot e)} = 1.0000000019 \times 10^{0}$$ where: $\lambda_{n1} = 3.32491769633 \times 10^{-10}\ m$ 57)

The above equations reveal that there are important and relevant parameters related to multiples of the natural number e including the first and lowest energy level of the $H1_{n1}$ hydrogen atom.

Below is a copy of a letter that I posted to my newelectrogravity@yahoogroups.com list and it will serve as an introduction to the next section.

The letter was introducing an equation that proves that mass, as for the electron for example, was intimately related to charge and the magnetic field and that none were more important than the other but that a relationship did exist that demands that the electric and magnetic field are part of the makeup of mass.

$$m_e := \frac{\mu_o \cdot q_o^{2}}{4 \cdot \pi \cdot l_q}$$ where, $m_e = 9.10938969141 \times 10^{-31}\ kg$ 58)

Although the equation appears to be static, I have proposed that mass is fundamentally a standing wave in a space that resembles a circular waveguide structure and that standing wave has electric and magnetic components which are internal to the waveguide structure. Further, all quantum particles exist in a self generated waveguide space. Finally, all quantum particles are connected through energy space and are instantly aware of each other through that common connection.

The letter is presented below.

Re: Electrogravity>>Electric and magnetic=mass

July 27, 2011

In my comments below, the the so-called 'derived' result is mass. That is not to say that charge or magnetic field is more fundamental, but that the equality statement shows that charge, magnetic field and mass are intimately related and for the electron, cannot be separated or one given more importance than the other. Further, it suggests that all mass contains some (hidden or internal) form of charge and magnetic field.

There is energy in the vacume and this has been proven. Further, the universe is not only expanding but the expansion is accelerating. This requires energy input and that energy comes via what we have naively in the past chosen to call a vacume.

Indeed, charge times the A vector yields momentum and this momentum represents a change or impulse on all quantum particles as proven by many different particle types being affected by the Aharonhov-Bohm test. Even so-called neutrally charged particles are affected.

The A-vector has the units of volt-second/meter. Magnetic permeability times current is also the A-vector. Even so called neutral particles respond to the A-vector proving that all particles can be considered to contain some form of electric and/or magnetic field. The A-vector can exist in a region of space that does not contain the magnetic field that is its source. In other words, it cannot be shielded against which makes it the primary source for gravitational field action. (As demonstrated on my web site link below.)

Respectfully,
Jerry E. Bayles
http://www.electrogravity.com

A key frequency can be derived from fundamental constants and the electrogravitational least quantum wavelength λ_{LM}:

The least quantum fluxoid in SI units is: $\Phi_o := 2.0678346 \cdot 10^{-15} \cdot \text{volt} \cdot \text{sec}$

$$f_x := \frac{\Phi_o \cdot q_o}{m_e \cdot \lambda_{LM}^2 \cdot 4 \cdot \pi} \qquad f_x = 3.99170463264 \times 10^{-1}\,\text{Hz}$$

The equation at the left is derived from the mass equation above (eq. 58) where μ_o is replaced by Φ_o/(amp*meter.) See below. 59)

where:

$8 \cdot \pi \cdot f_x = 1.00322479594 \times 10^{1}\,\text{Hz}$ which is the fundamental electrogravitational frequency.

My fundamental mass equation is: $m_e = \frac{\mu_o \cdot q_o^2}{4 \cdot \pi \cdot l_q}$ where μ_o is in henry/m units. 60)

Permeability (magnetic) of free space has a time (t_x) solution that relates to frequency:

$$\mu_o = \frac{\Phi_o}{\left(\frac{q_o}{t_x}\right) \cdot \lambda_{LM}}$$ has solution(s) $$\left(\frac{\mu_o}{\Phi_o} \cdot q_o \cdot \lambda_{LM}\right)^{-1} = 1.20617669475 \times 10^{12}\,\mathrm{Hz}$$ 61)

The above is an electromagnetic/quantum solution and has the 8π relationship of:

where from above:

$$\left(\frac{\mu_o}{\Phi_o} \cdot q_o \cdot \lambda_{LM}\right)^{-1} \cdot 8 \cdot \pi = 3.03145267453 \times 10^{13}\,\mathrm{Hz} \qquad f_{FQG} = 3.03145270192 \times 10^{13}\,\mathrm{Hz}$$ 62)

Including the equation for deriving the electron mass and utilizing λ_{LM} instead of l_q:

(μo)

$$m_e = \frac{\Phi_o}{\left(\frac{q_o}{t_x}\right) \cdot \lambda_{LM}} \cdot \left(\frac{q_o^2}{4 \cdot \pi \cdot \lambda_{LM}}\right)$$ simplifies to $$m_e = \frac{1}{4} \cdot \Phi_o \cdot q_o \cdot \frac{t_x}{\lambda_{LM}^2 \cdot \pi}$$ 63)

Solving for t_x and then f_x:

$$m_e = \frac{1}{4} \cdot \Phi_o \cdot q_o \cdot \frac{t_x}{\lambda_{LM}^2 \cdot \pi}$$ has solution(s) $$4 \cdot m_e \cdot \lambda_{LM}^2 \cdot \frac{\pi}{\Phi_o \cdot q_o} = 2.505195379 \times 10^{0}\,\mathrm{sec}$$ 64)

Then f_x = $$\left(4 \cdot m_e \cdot \lambda_{LM}^2 \cdot \frac{\pi}{\Phi_o \cdot q_o}\right)^{-1} = 3.99170463264 \times 10^{-1}\,\mathrm{Hz}$$ 65)

This is a fundamental quantum solution in the extreme low frequency range which is infrasonic in the acoustic range also. **This frequency fits the geometrical dimensions of the Great Pyramid perfectly and the results are universal. The same results would apply throughout the universe. Even on Mars.**

Eight times pi figures into the geometry of the Great Pyramid. If the distance from the edge of the pyramid to the center at the base is taken as pi, then the circumference is eight pi and the height is 4/pi. Further, if we use a velocity in air of 1206.365 feet per second, we arrive at the perimeter length when dividing f_x into that velocity.

$$v_x := 1206.365 \cdot ft \cdot sec^{-1} \qquad \lambda_x := v_x \cdot f_x^{-1} \qquad \lambda_x = 3.02218002338 \times 10^3\, ft \qquad 66)$$

Actual length of the perimeter is 3022.19 feet. Then the base of the pyramid's perimeter is one wavelength related to f_x at an air velocity of 1206 feet per second. It may have been hot near the pyramid. **1206.365 feet/second corresponds to an air temperature of 147.129 degrees Farenheit**. Next, the perimeter divided by 8 pi will yield the horizontal wavelength of the Grand Gallery which is also 1/2 the length of one side divided by π.

$$\lambda_{x8} := \lambda_x \cdot (8 \cdot \pi)^{-1} \qquad \lambda_{x8} = 1.20248722409 \times 10^2\, ft$$

This is close to the length of the Queen's Chamber gallery. 67)

Finally, λ_{x8} times 4/pi yields the length of the Grand Gallery inside the Great Pyramid at Giza.

$$\lambda_{GG} := \frac{4}{\pi} \cdot \lambda_{x8} \qquad \lambda_{GG} = 1.53105428575 \times 10^2\, ft \qquad 68)$$

$$\frac{v_x}{\lambda_{x8}} = 1.00322479594 \times 10^1\, Hz$$

which then demands that the Grand Gallery frequency is: 69)

$$\frac{v_x}{\lambda_{GG}} = 7.87930912202 \times 10^0\, Hz$$

which is the Schumann frequency. 70)

The Queen's Chamber generator is directly below the upper end of the Grand Gallery and at nearly the same level as the lower end of the Grand Gallery. The vertical distance leg is then:

$$\lambda_{vert} := \sqrt{\lambda_{GG}^2 - \lambda_{x8}^2} \qquad \lambda_{vert} = 9.47708658719 \times 10^1\, ft \qquad 71)$$

$$\frac{v_x}{\lambda_{vert}} = 1.27292811868 \times 10^1\, Hz \qquad \frac{1.27292811748 \times 10^1\, Hz}{7.87930911459 \times 10^0 \cdot Hz} = 1.61553265517 \times 10^0 \qquad 72)$$

which is very close to the Golden Ratio Φ. $\Phi := \frac{1 + \sqrt{5}}{2}$ $\Phi = 1.61803398875 \times 10^0$ 73)

If we consider the 27 resonators of the Grand Gallery to be frequency multipliers, then the final frequency output with the electrogravitational frequency input is:

$f_{KC} := f_{LM} \cdot \Phi \cdot 27 \quad f_{KC} = 4.38277994869 \times 10^{2}\,\mathrm{Hz}$ Equals the resonance of the King's Chamber.

The frequency of the King's Chamber can be raised to the hydrogen hyperfine frequency:

where:

$$\frac{f_{KC} \cdot \frac{3.956}{\pi}}{\alpha^{3}} = 1.42023299711 \times 10^{9}\,\mathrm{Hz} \qquad \frac{3.956}{\pi} = 1.25923390974 \times 10^{0}$$ Close to 4/π 74)

If 4/π is used:

$$\frac{f_{KC} \cdot \frac{4}{\pi}}{\alpha^{3}} = 1.43602931963 \times 10^{9}\,\mathrm{Hz}$$ (A 'pump' frequency should be a little higher.) 75)

The 1206 ft/sec velocity may not be an acoustic or air velocity but a velocity that is quantum. That is, the velocity may be a waveguide velocity in a quantum waveguide established by quantum particle action at the above frequencies and wavelengths. Thus it may not have actually been 144 degrees Fahrenheit near or in the pyramid. If it is quantum and independent of normal space, then it would follow a self engendered space-time waveguide geometry. Using v_x , the phase velocity relative to the least quantum electrogravitational velocity is determined to be:

$$v_{xp} := v_x^{2} \cdot v_{LM}^{-1} \qquad v_{xp} = 1.58272223128 \times 10^{6}\,\frac{m}{s}$$ 76)

The distance or wavelength relative to f_x is:

$$\lambda_{px} := v_{xp} \cdot f_x^{-1} \qquad \lambda_{px} = 2.46375443661 \times 10^{3}\,\mathrm{mi}$$ 77)

A geosynchronous orbit at the equator for the Earth is known to be 22,236 miles from the surface of the Earth and 26,199 miles from the center of the Earth. Then the wavelength λ_{px} is 1/10 the geosynchronous orbit distance. A nearly exact distance of 10 even wavelengths of λ_{px}. That is where a spacecraft would have been located that was benefiting from the power generation of the Great Pyramid. The wavelength is also very close to 1/10 the Earth's circumference.

The derivative taken with respect to time t_{LM} of the least quantum of circulation Q_c yields the least quantum electrogravitational velocity v_{LM}. Further the velocity will be complex.

$$f_{LM} := 1.003224805 \cdot 10^{01} \cdot Hz \qquad t_{LM} := f_{LM}^{-1} \qquad Q_c := 7.273896126 \cdot 10^{-04} \cdot \frac{m^2}{sec}$$

$$\lambda_{LM} := 8.514995416 \cdot 10^{-03} \cdot m \qquad \frac{\lambda_{LM}^2}{t_{LM}} = 7.27389618949 \times 10^{-4} \frac{m^2}{sec} \quad = Qc$$ 78)

$$\frac{d}{dt_{LM}} 1 \cdot \frac{\lambda_{LM}^2}{t_{LM}} = -7.29735308629 \times 10^{-3} \frac{m^2}{sec^2}$$ equal to the fine structure constant α times velocity squared but the result is negative in sign. 79)

$$v_{LM} := \sqrt{-7.2973530863 \cdot 10^{-3} \cdot \frac{m^2}{sec^2}} \qquad v_{LM} = 8.54245546158i \times 10^{-2} \frac{m}{s}$$ imaginary result. 80)

$$f_{LMi} := \frac{v_{LM}}{\lambda_{LM}} \qquad f_{LMi} = 1.003224805i \times 10^{1} Hz$$ Since the frequency is imaginary, the square of frequency will yield a negative result. 81)

$$\mu_o := 4 \cdot \pi \cdot 1 \cdot 10^{-07} henry \cdot m^{-1} \qquad h := 6.626075500 \cdot 10^{-34} \cdot joule \cdot sec \qquad r_{n1} := 5.291772490 \cdot 10^{-11} \cdot m$$

Then the electrogravitational attraction between two electrons separated a distance r_{n1} is:

$$F_{EGn1} := \frac{h \cdot f_{LMi}}{r_{n1}^2} \cdot \mu_o \cdot h \cdot f_{LMi} \qquad F_{EGn1} = -1.98297308289 \times 10^{-50} newton \cdot \frac{henry}{m} \cdot newton$$ 82)

where $h*f_{LM}$ is a fixed energy constant and the two sides around the permeability constant alternate between being fixed or variable relative to $1/r^2$ in quantum fashion of superposition. The above suggests negative time is associated with gravitational action.

$$\frac{h \cdot f_{LMi}}{r_{n1}^2} = 2.37384475391i \times 10^{-12} \frac{kg}{s^2} \quad \text{and} \quad \frac{h \cdot f_{LMi}}{r_{n1}^2} = 2.37384475391i \times 10^{-12} \frac{joule}{m^2}$$ 83)

Also: $$h \cdot f_{LMi} = 6.647443301411 \times 10^{-33} joule$$ 84)

The following is based on the concept of particles creating their own waveguide geometry that can transport them superluminally. The following equation for λ_G is from page 11-16 of reference **1**. The idea is to solve for a waveguide dimension B that will yield the quantum superluminal λ_G based on the exact λ_{H1} related to the hyperfine hydrogen frequency f_{H1} and the free space velocity of light. If we solve for B in the below equation, we arrive at a positive as well as negative result.

$$\lambda_G = \frac{\lambda}{\sqrt{1 - \left(\frac{\lambda}{2\cdot B}\right)^2}} \quad \text{has solution(s)} \quad \begin{bmatrix} \frac{2}{\left(4\cdot\lambda_G^2 - 4\cdot\lambda^2\right)}\cdot\left(\lambda_G^2 - \lambda^2\right)^{\frac{1}{2}}\cdot\lambda_G\cdot\lambda \\ \frac{-2}{\left(4\cdot\lambda_G^2 - 4\cdot\lambda^2\right)}\cdot\left(\lambda_G^2 - \lambda^2\right)^{\frac{1}{2}}\cdot\lambda_G\cdot\lambda \end{bmatrix} \qquad 85)$$

Then the solution for positive B is:

$$\frac{2}{\left(4\cdot\lambda_G^2 - 4\cdot\lambda^2\right)}\cdot\left(\lambda_G^2 - \lambda^2\right)^{\frac{1}{2}}\cdot\lambda_G\cdot\lambda \quad \text{simplifies to} \quad \frac{1}{2\cdot\left(\lambda_G^2 - \lambda^2\right)^{\frac{1}{2}}}\cdot\lambda_G\cdot\lambda \qquad 86)$$

Let λ be: $\lambda_{H2} := v_{lngth}\cdot f_{H1}^{-1}$ $\qquad \lambda_{H2} = 1.04220866672 \times 10^{-4}\,m$ 87)

And: $\lambda_G := \lambda_{LM}$ $\qquad \lambda_G = 8.514995416 \times 10^{-3}\,m$ **= Electrogravitational λ**

Then:

$$B := \frac{1}{2\cdot\left(\lambda_G^2 - \lambda_{H2}^2\right)^{\frac{1}{2}}}\cdot\lambda_G\cdot\lambda_{H2} \qquad B = 5.21143371041 \times 10^{-5}\,m \qquad 88)$$

$$\frac{\lambda_{H2}}{2} = 5.2110433336 \times 10^{-5}\,m \qquad 89)$$

$$\Delta\lambda 1 := B - \frac{\lambda_{H2}}{2} \qquad \Delta\lambda 1 = 3.90376811189 \times 10^{-9}\,m \qquad 90)$$

$$\frac{\Delta\lambda 1}{lngth} = 7.94481916086 \times 10^{-1} \quad 91) \qquad \frac{\Delta\lambda 1}{lngth1} = 1.54094472322 \times 10^{-2} \qquad 92)$$

$$\frac{\Delta\lambda 1}{lngth}\cdot\frac{4}{\pi} - \alpha = 1.00426843783 \times 10^{0} \qquad 93)$$

$$v_{lngth} = 1.48035918477 \times 10^{5}\,\frac{m}{s}$$

$$\frac{v_{lngth}}{lngth} = 3.01277782876 \times 10^{13}\,Hz \qquad f_{lngth} = 3.01277782876 \times 10^{13}\,Hz$$ 94)

$$\boxed{\frac{v_{lngth}}{\Delta\lambda 1} = 3.79212889275 \times 10^{13}\,Hz}$$

Note that the electrogravitational wavelength λ_{LM} is key to arriving at this frequency which is fundamental to the force constant also. 95)

Now the negative solution is investigated for the same λ_{LM}.

$$B := \frac{-1}{2\cdot\left(\lambda_G^{2} - \lambda_{H2}^{2}\right)^{\frac{1}{2}}}\cdot\lambda_G\cdot\lambda_{H2} \qquad B = -5.21143371041 \times 10^{-5}\,m$$ 96)

$$\frac{\lambda_{H2}}{2} = 5.2110433336 \times 10^{-5}\,m$$ 97)

$$\Delta\lambda 2 := B - \frac{\lambda_{H2}}{2} \qquad \Delta\lambda 2 = -1.0422477044 \times 10^{-4}\,m$$ 98)

$$\frac{\Delta\lambda 2}{lngth} = -2.12114789991 \times 10^{4}$$ 99)

$$\frac{\Delta\lambda 2}{lngth1} = -4.11409196027 \times 10^{2}$$ 100)

$$\frac{\Delta\lambda 2}{lngth}\cdot\frac{4}{\pi} = -2.7007293864 \times 10^{4}$$ 101)

$$v_{lngth} = 1.48035918477 \times 10^{5}\,\frac{m}{s}$$

$$\frac{v_{lngth}}{lngth} = 3.01277782876 \times 10^{13}\,Hz \qquad f_{lngth} = 3.01277782876 \times 10^{13}\,Hz$$ 102)

$$\boxed{\frac{v_{lngth}}{\Delta\lambda 2} = -1.42035255009 \times 10^{9}\,Hz}$$

Negative frequency suggests negative time which suggests energy induction also. 103)

Now let $\Delta\lambda$ be solved for by obtaining the sum instead of the difference of B and $\lambda_{H1}/2$.

$$B := \frac{1}{2\cdot\left(\lambda_G^{2} - \lambda_{H2}^{2}\right)^{\frac{1}{2}}}\cdot\lambda_G\cdot\lambda_{H2} \qquad B = 5.21143371041 \times 10^{-5}\,m \tag{104)}$$

$$\frac{\lambda_{H2}}{2} = 5.2110433336 \times 10^{-5}\,m \tag{105)}$$

$$\Delta\lambda 3 := \left(B + \frac{\lambda_{H2}}{2}\right) \qquad \Delta\lambda 3 = 1.0422477044 \times 10^{-4}\,m \tag{106)}$$

$$\frac{\Delta\lambda 3}{lngth} = 2.12114789991 \times 10^{4} \tag{107)}$$

$$\frac{\Delta\lambda 3}{lngth1} = 4.11409196027 \times 10^{2} \tag{108)}$$

$$\frac{\Delta\lambda 3}{lngth}\cdot\frac{4}{\pi} - \alpha = 2.70072865667 \times 10^{4} \tag{109)}$$

$$v_{lngth} = 1.48035918477 \times 10^{5}\,\frac{m}{s}$$

$$\frac{v_{lngth}}{lngth} = 3.01277782876 \times 10^{13}\,Hz \qquad f_{lngth} = 3.01277782876 \times 10^{13}\,Hz \tag{110)}$$

$$\frac{v_{lngth}}{\Delta\lambda 3} = 1.42035255009 \times 10^{9}\,Hz \tag{111)}$$

Note that the electrogravitational wavelength λ_{LM} is key to arriving at this frequency which is fundamental to the force constant also.

Now the negative solution is investigated for the same λ_{LM}.

$$B := \frac{-1}{2\cdot\left(\lambda_G^{2} - \lambda_{H2}^{2}\right)^{\frac{1}{2}}}\cdot\lambda_G\cdot\lambda_{H2} \qquad B = -5.21143371041 \times 10^{-5}\,m \tag{112)}$$

$$\frac{\lambda_{H2}}{2} = 5.2110433336 \times 10^{-5}\,m \tag{113)}$$

$$\Delta\lambda 4 := B + \frac{\lambda_{H2}}{2} \qquad \Delta\lambda 4 = -3.90376811189 \times 10^{-9}\,m \tag{114)}$$

$$\frac{\Delta\lambda 4}{\mathrm{lngth}} = -7.94481916086 \times 10^{-1}$$ 115)

$$\frac{\Delta\lambda 4}{\mathrm{lngth1}} = -1.54094472322 \times 10^{-2}$$ 116)

$$\frac{\Delta\lambda 4}{\mathrm{lngth}} \cdot \frac{4}{\pi} = -1.01156579314 \times 10^{0}$$ 117)

$$v_{\mathrm{lngth}} = 1.48035918477 \times 10^{5} \frac{\mathrm{m}}{\mathrm{s}}$$ 118)

$$\frac{v_{\mathrm{lngth}}}{\mathrm{lngth}} = 3.01277782876 \times 10^{13}\,\mathrm{Hz} \qquad f_{\mathrm{lngth}} = 3.01277782876 \times 10^{13}\,\mathrm{Hz}$$ 119)

$$\frac{v_{\mathrm{lngth}}}{\Delta\lambda 4} = -3.79212889275 \times 10^{13}\,\mathrm{Hz}$$

Negative frequency suggests negative time which suggests energy induction also. 120)

To provide asymmetrical energy conditions for obtaining Poynting power vector unbalance, (which is necessary for mass-field thrust), the surface of the craft would be designed in the fashion of what is called a circulator which would only allow power flow in one direction of rotation. This would prevent the cancellation of the frequencies above due to the sum and difference frequencies canceling each other. This may be best accomplished by having a variable magnetic field available in the surface amalgam of various metals that also will set the velocity of the field to the correct value $v_{\mathrm{lngth}} = 1.48035918477 \times 10^{5}\,\mathrm{m\,sec}^{-1}$. The velocity can also be adjusted via a magnetic field for greater velocity in one direction than the other to accomplish directional field thrust. Free power can be input at one frequency and then output at another for maximum thrust.

Tesla was a man far ahead of conventional science. I have read accounts of boxes of his papers being carried off by people just after his death. I cannot help but wonder at what human cost the loss of that information represents. In my own research I have come to the conclusion that Tesla used the coils the way that He did because they allowed for nearly instantaneous power transfer with no or little loss with distance as long as the coils were properly spaced at peak wavelengths of their operating frequency. His extensive tests in Colorado actually transmitted power from one coil to another over considerable distance and amounted to kilowatts as reported by his own technician. That paved the way for His attempt to build a giant coil at Wardencliff which was scuttled when it was found that Tesla wanted to transmit power for free to the entire world. It is interesting that some of his drawings indicate that aircraft were to be able to tap into that power for propulsion and that also applied to automobiles and ships at sea. There is the possibility that his energy transmissions could gain power so that the energy transmitted became greater than the source since the "waves" could induce energy out of the background energy of space itself.

The constant of force F_{QG} leads to interesting results when analyzing the wavelength verses energy level compared to standard quantum results. We begin with the low frequency f_x.

$$E_x := h \cdot f_x \qquad E_x = 2.64493362695 \times 10^{-34} J \quad \text{where,} \quad f_x = 3.99170463264 \times 10^{-1} Hz$$

$$\lambda_{xLM} := E_x \cdot F_{QG}^{-1} \qquad \lambda_{xLM} = 8.92240959437 \times 10^{-18} m \tag{121}$$

The comparable electron quantum energy and frequency related to the wavelength above is:

$$v_{QLM} := \frac{h}{m_e \cdot \lambda_{xLM}} \qquad v_{QLM} = 8.15238990813 \times 10^{13} \frac{m}{s} \tag{122}$$

$$E_{QLM} := \frac{1}{2} m_e \cdot \left(\frac{h}{m_e \cdot \lambda_{xLM}} \right)^2 \qquad E_{QLM} = 3.02711674831 \times 10^{-3} J \tag{123}$$

$$f_{QLM} := h^{-1} \cdot E_{QLM} \qquad f_{QLM} = 4.5684911805 \times 10^{30} Hz \tag{124}$$

$$\lambda_{QLM} := E_{QLM} \cdot F_{QG}^{-1} \qquad \lambda_{QLM} = 1.02116647628 \times 10^{14} m \tag{125}$$

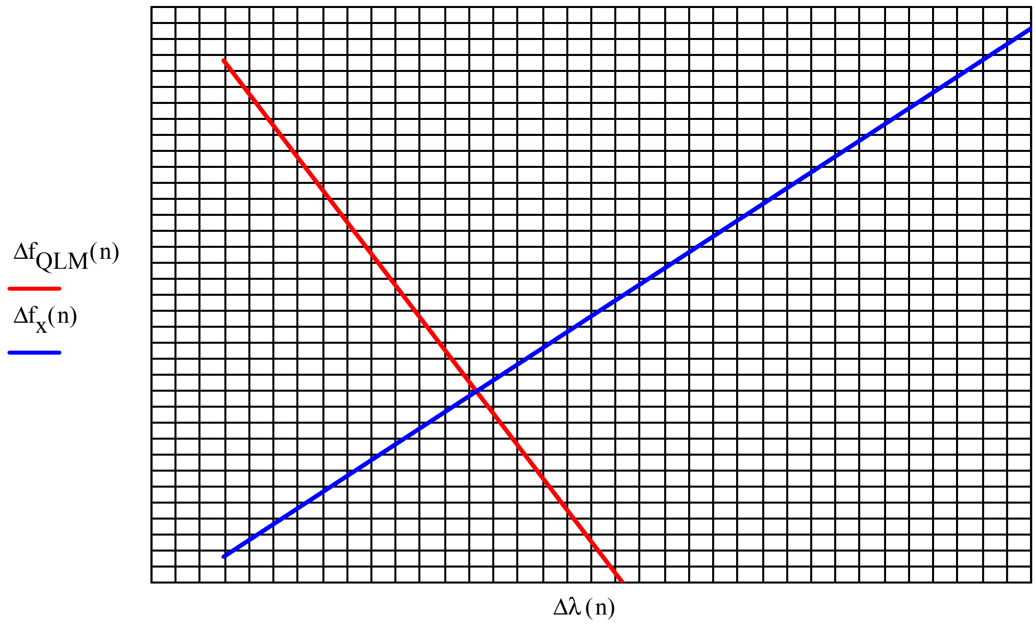
The results for the constant force and quantum approach are opposite and quite large when the final energy and wavelengths are compared. (On the order of 1*10^32.) Let a range variable be established as:

$$n := 0, 0.001 .. 34 \qquad \Delta\lambda(n) := \lambda_{xLM} \cdot 10^n$$

$$\Delta f_x(n) := F_{QG} \cdot \Delta\lambda(n) \cdot h^{-1} \qquad \Delta f_{QLM}(n) := h^{-1} \cdot \left[\frac{1}{2} m_e \cdot \left(\frac{h}{m_e \cdot \Delta\lambda(n)} \right)^2 \right] \tag{126}$$

When the wavelengths are the same, the frequencies are the same and the required velocity is also established for the medium at the crossing points of the frequencies in the plot below. This is where the induced energy equals the energy output and thus is the best operational control point. The force constant is based on inductance times current squared divided by distance, or pure **field energy** divided by distance. Then energy is directly proportional to distance. The quantum energy is based on the mass of the electron times the velocity squared, where the velocity is obtained by dividing the mass times wavelength into Planks constant, h. Thus the energy related to the force constant times distance is compared to the quantum energy related to particle **kinetic energy**.

Fig. 4



$X := 2.5399 \cdot 10^{-07} \cdot m$ $\quad Y := 1.1582 \cdot 10^{10} \cdot Hz$ This wavelength and frequency are the gateway to unlimited energy? 127)

Note: X very close to lngth1 in eq. 54: $lngth1 = 2.5333602517 \times 10^{-7} m$

$Vel := X \cdot Y$ $\quad Vel = 2.94171218 \times 10^{3} \frac{m}{s}$ This velocity may be engineered by the combination of metals and crystalline structure as explained above. 128)

The volts/meter can be calculated based on the above axis crossing result as:

$\frac{h \cdot Y}{q_o \cdot X} = 1.88587429161 \times 10^{2} \frac{volt}{m}$ **Compare to E_V above:** $E_V = 1.85021432697 \times 10^{2} \frac{volt}{m}$

which is derived from the force constant being divided by the quantum electron charge. Again, the volts/meter is very close to the established volts/meter of the Earth. (The general intensity of the Earth's electric field is about 100 to 150 volts/meter but I have personally measured closer to that as shown by the result above.) Then the electric field of the Earth can be provided by the force constant F_{QG}. The volts/meter is established when the kinetic energy of the electron is equal to the force times wavelength as shown on the above chart. Then tapping into the limitless energy connected to the force constant may be accomplished by tuning into the frequency at the wavelength as shown by the chart. There are no numbers on the chart. The numbers were extracted by using Mathcad's trace function to find the wavelength and frequency at the crossing point of the red and blue lines as shown.

The above distance and frequency can be explored for its relationship to the Casimer force, or zero point energy, which demonstrates that the so called vacume of space is teeming with energy at the quantum level and is not empty as was previously thought. I suggest that the force constant is the source for this energy. Also, that the force constant may be connected to the gluon force, which theory predicts will grow stronger in proportion to distance as quarks are pulled apart: If that were possible.

It is of interest that if we multiply the wavelength in X above times the hyperfine frequency of the H1 atom, we arrive at a velocity very close to the pyramid velocity calculated as close to 1206 ft/sec.

$v_{H1} := X \cdot f_{H1}$ $\quad v_{H1} = 1.18362485858 \times 10^{3} \frac{ft}{sec}$ where $f_{H1} = 1.42040575179 \times 10^{9} Hz$

From previous: $v_x = 1.206365 \times 10^{3} \frac{ft}{sec}$ $\quad f_x = 3.99170463264 \times 10^{-1} Hz$

$\frac{v_x}{v_{H1}} = 1.01921228779 \times 10^{0}$ which is very close considering the accuracy of the graphing solution of wavelength and frequency above. 129)

Then a more accurate wavelength at the crossing point would be: (eq. 54)

$\lambda_X := \frac{v_x}{f_{H1}}$ $\quad \lambda_X = 2.58869728975 \times 10^{-7} m$ $\quad lngth1 = 2.5333602517 \times 10^{-7} m$ 130)

$v_{H1} := \lambda_X \cdot f_{H1}$ More correct v_{H1}: $v_{H1} = 1.206365 \times 10^{3} \frac{ft}{sec}$

The following shows a definite scaling geometry involving α, $4/\pi$ and the natural number e.

$\lambda_{LM} = 8.514995416 \times 10^{-3} m$ = electrogravitational least quantum wavelength.

$\Lambda 1 := \frac{\lambda_{LM} \cdot \alpha}{2 \cdot e}$ $\quad \Lambda 1 = 1.14294526686 \times 10^{-5} m$ 131)

(NOTE:)

$\Lambda 2 := \frac{\lambda_{LM} \cdot \alpha}{2 \cdot e} \cdot \frac{\alpha}{\left(\frac{4}{\pi}\right)^4}$ $\quad \Lambda 2 = 3.17358731448 \times 10^{-8} m$ $\quad \frac{\Lambda 2 \cdot (8)}{X} = 9.99594413791 \times 10^{-1}$

where X is the gateway wavelength

132)

Where: $\Lambda 2 \cdot \frac{F_{QG}}{h} = 1.41979843576 \times 10^{9} Hz$ **very close to hydrogen hyperfine frequency.**

$$\Lambda 3 := \frac{\lambda_{LM}\cdot\alpha}{2\cdot e}\cdot\frac{\alpha}{\left(\frac{4}{\pi}\right)^{4}}\cdot\alpha\cdot\left[\left(\frac{4}{\pi}\right)\cdot\left(\sqrt{\frac{4}{\pi}}\right)\right] \qquad \Lambda 3 = 3.32721696681\times 10^{-10}\,m \qquad 133)$$

very close to the H1n1 wavelength.

Summary:

$\lambda_{H1} = 9.03806611453\times 10^{-10}\,m$

$lngth = 4.91360222662\times 10^{-9}\,m$

$lngth1 = 2.5333602517\times 10^{-7}\,m$

$\lambda_{H2} = 1.04220866672\times 10^{-4}\,m$ where, $\dfrac{\lambda_{H2}}{\Lambda 1\cdot\left(\frac{4}{\pi}\right)^{5}\cdot e} = 1.00249951633\times 10^{0}$ 134)

And:

$$\frac{\lambda_{H2}\cdot\alpha}{lngth1\cdot 3} = 1.00069554406\times 10^{0} \qquad \frac{\lambda_{H2}\cdot\left(\frac{4}{\pi}\right)^{2}}{\lambda_{LM}\cdot\alpha\cdot e} = 1.00030058924\times 10^{0} \qquad 135)$$

$$\frac{Vel}{v_x} = 8.00030395427\times 10^{0} \qquad 136)$$

$v_x = 1.206365\times 10^{3}\,\frac{ft}{sec}$

It will be shown that the fine structure constant, which is usually applied to quantum energy exchanges such as for electron/photon interactions, can also be applied to the dimensions of the Great Pyramid. This strongly suggests that the actual builders of the Great Pyramid were technically far ahead of the Egyptians, who supposedly were the designers and builders of the same.

The fine structure α figures into to Grand Gallery resonator spacing and thus the Grand Gallery and King's Chamber main frequency also.

$$\frac{8 \cdot f_x}{\alpha} = 4.37605621671 \times 10^{2}\,Hz \quad \text{where} \quad f_x = 3.99170463264 \times 10^{-1}\,Hz$$ 137)

$$GG\lambda := \left(\frac{\lambda_x \cdot \alpha}{8}\right) \quad GG\lambda = 2.75674017942 \times 10^{0}\,ft \ \text{(or)} \quad GG\lambda = 3.30808821531 \times 10^{1}\,in$$ 138)

Note: This corresponds exactly with previous work involving steel mast pipe calculations where 3 pipes each having 3 lengths of 33 inches generated high voltage and tornado wind action at acoustic frequencies near 438 Hz as the frequency was slowly rising.[5]

$$f_{GG\lambda} := \frac{v_x}{GG\lambda} \quad f_{GG\lambda} = 4.37605621671 \times 10^{2}\,Hz \quad \text{where,} \quad v_x = 1.206365 \times 10^{3}\,\frac{ft}{sec}$$ 139)

Total length of 27 resonator sections 2 x GGλ apart is:

$$GG\lambda_{total} := 2 \cdot 26 \cdot GG\lambda \quad GG\lambda_{total} = 1.4335048933 \times 10^{2}\,ft$$ 140)

which is the length from beginning to end of the resonator stacks.

Finally, the total Grand Gallery length into the velocity yields:

$$\frac{v_x}{\lambda_{GG}} = 7.87930912202 \times 10^{0}\,Hz \quad = \text{Schumann frequency.}$$ 141)

Let us imagine that we have a coil of the below diameter. Then the circumference is π times that diameter. Or, letting $D_{coil} := \left(\frac{4}{\pi}\right)^2 \cdot in$

$$C_{coil} := \pi \cdot D_{coil} \qquad C_{coil} = 5.09295817894 \times 10^{0}\,in$$ 142)

It is found that the length of the coil wire is $(4/\pi)$ squared greater than the circumference.

Then: $L_{coil} := C_{coil} \cdot \left(\frac{4}{\pi}\right)^2 \qquad L_{coil} = 8.2563928149 \times 10^{0}\,in$ 143)

It is found that dividing L_{coil} by $4/\pi$ will give the linear distance from the start to finish of one turn.

$$L_{axis} := \frac{L_{coil}}{\left(\frac{4}{\pi}\right)} \qquad L_{axis} = 6.48455575311 \times 10^{0}\,\text{in} \quad \text{and} \quad C_{coil} \cdot \frac{4}{\pi} = 6.48455575311 \times 10^{0}\,\text{in} \qquad 144)$$

Then a wire L_{coil} inches long does occupy a length along the coil axis of L_{axis} for a distance of one turn. This was checked by actually winding a string 8.26 inches long around a 1.62 inch diameter tube which also yielded the axial length equal to L_{axis} of 6.48 inches.

The number of complete turns in $GG\lambda$ is:

$$\frac{GG\lambda}{L_{axis}} = 5.1014878139 \times 10^{0}$$

The total length of wire for $GG\lambda$ is: $\frac{GG\lambda}{L_{axis}} \cdot L_{axis} = 3.30808821531 \times 10^{1}\,\text{in}$ 145)

Note that 2 times $GG\lambda$ is the actual length between thr resonators in the Grand Gallery.

The Ark of the Covenant had dimensions 2.5 cubits long, 1.5 cubits wide and 1.5 cubits high and was layered inside and out over acacia wood which would make a dandy capacitor for storing a large electrical charge. Further, 18 inches is used in the bible for a cubit. This makes the length 45 inches. Thus, we have a container that could easily house a 33.25 inch long rod or energy-pipe as described above. Note that $4/\pi$ times 33.25 inches yields 42.34 inches which may allow for the thickness of the walls of the Ark with a little bit to spare. Further, connecting two "Cherubs", that sat on the top of the Ark facing each other, to the energy pipe inside of the Ark would allow for the finely tuned energy pipe to generate arcs of electrical energy between the gold Cherubs where the inside and the outside of the Ark where connected appositely to the Cherubs forming a series tuned circuit with the Cherubs acting as the spark gap. The frequency would be some multiple or sub multiple of the hyperfine frequency of the Hydrogen atom at 21 cm wavelength.

This brings to mind Tesla and his high voltage coils because of the spark gap mentioned above. If we think about two identical Tesla coils some distance apart, we essentially have a transmission line that is a quarter wavelength or odd multiple thereof separated by some distance greater than the length of the represented by each coil winding. I suspect that the velocity of the wave between the coils was much higher than the speed of light since the two Tesla coils form a sort of open waveguide geometry where the velocity in the coils is the group velocity and the velocity between the coils is a phase velocity as for ordinary waveguide action. A very similar scenario occurs between two oppositely phased 'split' photons as demonstrated by the famous experiments in France by Nicholas Giesen. There, it was demonstrated that interfering with one photon in a transmission path instantly caused the other photon in a distant transmission path to change its phase. Thus Tesla was justified when he said that the Hertz method of using the Marconi style of energy transmission for communications was a horrible waste of power. Tesla (quantum) power transmission did not suffer the reduction in amplitude that Marconi transmissions exhibit.

An interesting idea is one of mutual teleportation where quantum particles can change places instantly with each other without any external observer being able to tell that such a thing occurred. For instance, what if the two photons in the Nicholas Geisen experiment could swap places instantly if one of them were interfered with. This would appear as communication between the opposite spin photons when in fact they would actually have exchanged places. I remember discussing such a possibility with my physics instructor one day and without hesitation he replied, "who says that they can't?" At that time I was talking about two electrons. I was not considering spin as a factor at that time. It is of interest that photons contain an energy by $e=hf$ and this mutual teleportation represents a transfer of energy that is not accompanied by a spreading or loss of energy as for ordinary electromagnetic radiation per square meter.

This brings to mind the duality of particle/wave action wherein I see the photon as stationary relative to the source except that it takes a quantum jump at the rate of its frequency and that jump distance is equal to its wavelength so that it always travels in free space at the velocity of light. (By $c=\lambda f$.) Thus a 'wave' is apparent which is actually formed from the instantaneous but periodic quantum displacement of the photon which is actually a standing wave particle. As the photon progresses in the Z direction, the X and Y directions become more spread out in the distance between jumps and thus the strength falls off in the Z direction as 1/Z squared.

The ability to exchange energy by mutual transposition of two oppositely phased photons can be applied to the action of two identical Tesla coils having opposite phase to each other and separated by a large distance compared to their natural quarter-wavelength. They operate together as a standing wave device such as for a quarter wavelength transmission line. What one is doing electrically, the other is doing instantly in opposite phase.

Tesla's experiments in the high plains of Colorado showed that when he used his coil as a receiver, the power of the lightening did not diminish with distance. (The maximum peaks actually occurring at regular distance intervals.) This is exactly the same action as the exchange of photons or electrons would show. Thus, Tesla was operating macroscopic coils of large dimensions and demonstrating quantum teleportation of energy with potentially minimal loss of power. I envision a solid object inside of one coil suddenly appearing inside the companion coil when phase conditions were suddenly perturbed. If the Great Pyramid at Giza in Egypt were to be considered as a quantum device likened to Tesla coil action, then it may have been linked by quantum energy teleportation to many of the other pyramids that have been discovered throughout the world. If so, we are quite backwards in our methods of energy transmission by comparison. Tesla envisioned free power transmission in like manner of the pyramids and he also likely knew that any power used was restored by the unseen background energy that powers the universe with restoration energy in regular quantum fashion, much like the sequential frames of a motion picture film that occur so fast the motion looks smooth and continuous. If you attempt to diminish a frame, energy is supplied to keep it going and that energy that was extracted in our real universe shows up in the universe as dark matter or negative energy and is a waste product.

The next page presents the double cross-product mechanism of the electrogravitational action. Several terms such as pressure, inductance, the A-vector etc., are experimented with so that the diversity of the double cross-product is explored more fully. Energy can have a vector as well as having a scalar aspect. Here, we explore the vector aspect.

Statement of parameters:

$\Phi_o = 2.0678346 \times 10^{-15}\,\mathrm{Wb}$

$h = 6.6260755 \times 10^{-34}\,\dfrac{\mathrm{kg\,m^2}}{\mathrm{s}}$

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

$\mu_o = 1.25663706144 \times 10^{-6}\,\dfrac{\mathrm{newton}}{\mathrm{amp^2}}$

$R_{n1} := \lambda_e \cdot (2 \cdot \pi \cdot \alpha)^{-1}$

$R_{n1} = 5.29177086745 \times 10^{-11}\,\mathrm{m}$

$i_{LM} := q_o \cdot f_{LM}$

$i_{LM} = 1.60734403946 \times 10^{-18}\,\mathrm{amp}$

A B E 146)

$$F_{Gn1} := (\mu_o \cdot i_{LM}) \cdot \left(\frac{2 \cdot \Phi_o}{R_{n1}^{2}}\right) \cdot (m_e \cdot v_{LM}^{2}) \qquad F_{Gn1} = -1.9829742789 \times 10^{-50}\,\mathrm{newton} \cdot \frac{\mathrm{henry}}{\mathrm{m}} \cdot \mathrm{newton}$$

$$F_{Gn1X1} := \begin{pmatrix} \mu_o \cdot i_{LM} \\ 0 \cdot \mathrm{volt \cdot sec \cdot m^{-1}} \\ 0 \cdot \mathrm{volt \cdot sec \cdot m^{-1}} \end{pmatrix} \times \begin{bmatrix} 0 \cdot \mathrm{tesla} \\ \left(\dfrac{2 \cdot \Phi_o}{R_{n1}^{2}}\right) \\ 0 \cdot \mathrm{tesla} \end{bmatrix} \times \begin{pmatrix} m_e \cdot v_{LM}^{2} \\ 0 \cdot \mathrm{joule} \\ 0 \cdot \mathrm{joule} \end{pmatrix}$$

Vector cross product of the the above equation. 147)

$$F_{Gn1X1} = \begin{pmatrix} 0 \times 10^{0} \\ -1.9829742789 \times 10^{-50} \\ 0 \times 10^{0} \end{pmatrix} \mathrm{newton} \cdot \frac{\mathrm{henry}}{\mathrm{m}} \cdot \mathrm{newton}$$

Gravitational force between two electrons at the Bohr radius n1 of the Hydrogen atom. 148)

$$F_{Gn1X2a} := \begin{pmatrix} \mu_o \cdot i_{LM} \\ 0 \cdot \mathrm{volt \cdot sec \cdot m^{-1}} \\ 0 \cdot \mathrm{volt \cdot sec \cdot m^{-1}} \end{pmatrix} \times \begin{bmatrix} 0 \cdot \mathrm{tesla} \\ \left(\dfrac{2 \cdot \Phi_o}{R_{n1}^{2}}\right) \\ 0 \cdot \mathrm{tesla} \end{bmatrix} \times \begin{pmatrix} 0 \cdot \mathrm{joule} \\ m_e \cdot v_{LM}^{2} \\ 0 \cdot \mathrm{joule} \end{pmatrix}$$

149)

$$F_{Gn1X2a} = \begin{pmatrix} 1.9829742789 \times 10^{-50} \\ 0 \times 10^{0} \\ 0 \times 10^{0} \end{pmatrix} \mathrm{newton} \cdot \frac{\mathrm{henry}}{\mathrm{m}} \cdot \mathrm{newton}$$

Reverse gravity 150)

$$F_{Gn1X3} := \begin{pmatrix} \mu_o \cdot i_{LM} \\ 0 \cdot volt \cdot sec \cdot m^{-1} \\ 0 \cdot volt \cdot sec \cdot m^{-1} \end{pmatrix} \times \begin{bmatrix} 0 \cdot tesla \\ \left(\frac{2 \cdot \Phi_o}{R_{n1}^2}\right) \\ 0 \cdot tesla \end{bmatrix} \times \begin{pmatrix} 0 \cdot joule \\ 0 \cdot joule \\ m_e \cdot v_{LM}^2 \end{pmatrix} \qquad 151)$$

$$F_{Gn1X3} = \begin{pmatrix} 0 \times 10^0 \\ 0 \times 10^0 \\ 0 \times 10^0 \end{pmatrix} newton \cdot \frac{henry}{m} \cdot newton$$ No Gravity 152)

Note:
$$\begin{pmatrix} \mu_o \cdot i_{LM} \\ 0 \cdot volt \cdot sec \cdot m^{-1} \\ 0 \cdot volt \cdot sec \cdot m^{-1} \end{pmatrix} \times \begin{bmatrix} 0 \cdot tesla \\ \left(\frac{2 \cdot \Phi_o}{R_{n1}^2}\right) \\ 0 \cdot tesla \end{bmatrix} = \begin{pmatrix} 0 \times 10^0 \\ 0 \times 10^0 \\ 2.98306309664 \times 10^{-18} \end{pmatrix} Pa \cdot henry \qquad 153)$$

In order that a vertical force of gravity (z direction) be generated, the magnetic flux in a torus in the x and y direction is established internally as well as a motional rotational energy in the x and y plane which is in the plane of the horizontal.

$$F_{Gn1X2z} := \begin{pmatrix} 0 \cdot volt \cdot sec \cdot m^{-1} \\ 0 \cdot volt \cdot sec \cdot m^{-1} \\ \mu_o \cdot i_{LM} \end{pmatrix} \times \begin{bmatrix} \left(\frac{2 \cdot \Phi_o}{R_{n1}^2}\right) \\ \left(\frac{2 \cdot \Phi_o}{R_{n1}^2}\right) \\ 0 \cdot tesla \end{bmatrix} \times \begin{pmatrix} m_e \cdot v_{LM}^2 \\ m_e \cdot v_{LM}^2 \\ 0 \cdot joule \end{pmatrix} \qquad 154)$$

where: $v_{LM} = 8.5424546158i \times 10^{-2} \frac{m}{s}$

$$F_{Gn1X2z} = \begin{pmatrix} 0 \times 10^0 \\ 0 \times 10^0 \\ 3.96594855779 \times 10^{-50} \end{pmatrix} newton \cdot \frac{henry}{m} \cdot newton$$ Gravitational attraction reversed.

To generate an opposite force in the z direction, the rotation of the torus must be reversed in **both** the x and y direction which is counter rotational to the formula above in the horizontal plane. Of coarse, both the x and y directions are necessary dimensionally to have rotation about the vertical z direction.

$$F_{Gn1X2zRev} := \begin{pmatrix} 0\cdot volt\cdot sec\cdot m^{-1} \\ 0\cdot volt\cdot sec\cdot m^{-1} \\ \mu_o\cdot i_{LM} \end{pmatrix} \times \begin{bmatrix} \left(\dfrac{2\cdot\Phi_o}{R_{n1}^{2}}\right) \\ \left(\dfrac{2\cdot\Phi_o}{R_{n1}^{2}}\right) \\ 0\cdot tesla \end{bmatrix} \times \begin{pmatrix} -m_e\cdot v_{LM}^{2} \\ -m_e\cdot v_{LM}^{2} \\ 0\cdot joule \end{pmatrix} \qquad 155)$$

$$F_{Gn1X2zRev} = \begin{pmatrix} 0\times 10^{0} \\ 0\times 10^{0} \\ -3.96594855779\times 10^{-50} \end{pmatrix} \frac{newton^{3}}{amp^{2}} \qquad 156)$$

Gravitational action.

NOTE: $\dfrac{newton^{3}}{amp^{2}} = 1\times 10^{0}\, newton\cdot\dfrac{henry}{m}\cdot newton$

In a three dimensional system, only one newton term applies as the shortest distance between two points.

For an experiment that is rotating disk magnets where the axis of rotation is vertical (z axis) and the magnetic B flux is also vertical, the following applies:

$$\begin{matrix} A & & B & & E \end{matrix}$$

$$F_{Gn1Exp} := \begin{pmatrix} \mu_o\cdot i_{LM} \\ \mu_o\cdot i_{LM} \\ 0\cdot volt\cdot\dfrac{sec}{m} \end{pmatrix} \times \begin{bmatrix} 0\cdot tesla \\ 0\cdot tesla \\ \left(\dfrac{2\cdot\Phi_o}{R_{n1}^{2}}\right) \end{bmatrix} \times \begin{pmatrix} -m_e\cdot v_{LM}^{2} \\ -m_e\cdot v_{LM}^{2} \\ 0\cdot joule \end{pmatrix} \qquad 157)$$

$$F_{Gn1Exp} = \begin{pmatrix} 0\times 10^{0} \\ 0\times 10^{0} \\ 3.96594855779\times 10^{-50} \end{pmatrix} newton\cdot\frac{henry}{m}\cdot newton \qquad 158)$$

Reverse Gravitational action.

Statement of parameters:

$$A := \mu_o \cdot i_{LM} \qquad A = 2.01984809047 \times 10^{-24}\,\mathrm{volt \cdot sec \cdot m^{-1}}$$

$$B := \frac{2 \cdot \Phi_o}{R_{n1}^2} \qquad B = 1.47687497427 \times 10^{6}\,\mathrm{tesla}$$

$$E_{n1} := m_e \cdot v_{LM}^2 \qquad E_{n1} = -6.64744329789 \times 10^{-33}\,\mathrm{joule}$$

Also:

ΔΔPa henry joule

159)

$$\left(F_{Gn1Pa}\right) := \left[\frac{\left(\mu_o \cdot i_{LM}^2\right)}{R_{n1}^2}\right] \cdot \left(L_Q\right) \cdot \left(h \cdot f_{LM}\right) \qquad F_{Gn1Pa} = 1.98297427783 \times 10^{-50}\,\mathrm{newton} \cdot \frac{\mathrm{henry}}{\mathrm{m}} \cdot \mathrm{newton}$$

Where: $L_Q = 2.57298319094 \times 10^{3}\,\mathrm{henry}$ = electrogravitational inductance constant.

Those familiar with computer clock schemes are aware that the computer address and data buss can be clocked with clocks designated as phase 1 and phase 2 which are both derived from a master clock which can be running at twice the clock rate of either 'phase' clock. I envision the electrogravitational action as being similar wherein three dimensional space is generated by three clocks also, one master clock and two oppositely phased clocks synched to the master clock.

Further, looking at the electrogravitational equation, it is seen that there are three distinct sections in the electrogravitational equation. The left side may be readily substituted for the right side for example and this could be an example of superposition such as demonstrated by quantum phenomena. For example, the fascinating experiments conducted by Nicholas Geisen wherein the photons which are 180 degrees out of phase but in the same frequency communicate a change of phase of one to the other instantly and the distance between them or what is in between matters not at all.

When the left of the equation is clocked, the output is expressed in terms of the newton, and when the right side of the equation is clocked, the output is also expressed as a newton, identical in magnitude to the left side. The common connector in the middle term combines the action so that the total action appears as a single newton over time but in magnitude is equal to the product of all three terms. In this manner, three dimensional action can occur via 'stepped phase' and appear as a one dimensional action.

Then the electrogravitational force has the dimension of three newton forces, all 90 degrees to each other and all divided by current squared. The current is proportional to distance between two points in space and for electrogravitational force, is the same result as for ordinary gravitational force. If we allow for a fundamental current to be established from the force constant FQG, we can establish three sections to the electrogravitational equation all based on the same current.

$$I_K := \frac{\lambda_{LM}}{l_q} \cdot i_{LM} \qquad I_K = 4.85692479599 \times 10^{-6}\,\text{amp} \qquad I_{dis} := \sqrt{\left(\frac{4}{\pi}\right)^4 \cdot \frac{1}{2}} \cdot \text{amp} \tag{160)}$$

Note that: $I_{dis} = 1.1463183365 \times 10^{0}\,\text{amp}$

φ0

φ1 master clock φ2

Where finally,

$$\frac{\left(\mu_o \cdot I_K^2\right)}{I_{dis}} \cdot \left(\mu_o \cdot I_K^2\right) \cdot \frac{\left(\mu_o \cdot I_K^2\right)}{I_{dis}} = 1.98238218859 \times 10^{-50}\,\frac{\text{newton}^3}{\text{amp}^2} \tag{161)}$$

$$f_{Idis} := \frac{I_{dis}}{q_o} \qquad f_{Idis} = 7.15475319141 \times 10^{18}\,\text{Hz} \qquad f_{Idis} \cdot \alpha^2 = 3.81000584683 \times 10^{14}\,\text{Hz} \tag{162)}$$

The frequency result matches that necessary to interface electrogravitationally with all matter.

The combined force output acts as one newton term at a time along the shortest distance between two points in space along a geodesic line. The other two spatial dimensions/directions are not relevant unless other matter is along those pathways.

Where: $\mu_o \cdot I_K^2 = 2.96437145031 \times 10^{-17}\,\text{N}$ and $F_{QG} = 2.96437145031 \times 10^{-17}\,\text{N}$ 163)

It is obvious that the basic form of the electrogravitational equation is robust in the ability of the concept to be stated in many forms that all allow for the same result in magnitude and units.

The basic form of the electrogravitational equation is energy divided by radius times the magnetic permeability of free space times energy divided by radius. In the quantum form, energy is stated as plank's constant times frequency. Allowing for superposition of the two energies, where each energy can exist only if the other does not, and allowing for this condition to alternate, then only one newton is active at any given time and the total interaction has the magnitude and units as stated above which is dependent on being related to the variable of $1/r^2$.

The next page introduces the mathematics of the magnetic curl but extends that math to develop the dynamics of force arising from energy in rotation.

$q_o := 1.60217733000000001 \cdot 10^{-19} \cdot coul$ $\qquad \varepsilon_o := 8.85418781000000000017 \cdot 10^{-12} farad \cdot m^{-1}$

$r_{n1} := \left(5.29177249000000001 \cdot 10^{-11} \cdot m\right)$ $\qquad F_{n1} := q_o^{2} \cdot \left(4 \cdot \pi \cdot \varepsilon_o \cdot r_{n1}^{2}\right)^{-1}$ 164)

$F_{n1} = 8.23872947254 \times 10^{-8} newton$ $\qquad r_x := r_{n1}$ $\qquad r_y := r_{n1} \cdot 0$ $\qquad r_z := r_{n1} \cdot 0$

The above parameters are the dimensions of the n1 level as well as the associated electric force.

165)

$E_x := F_{n1} \cdot r_x$ $\qquad E_y := F_{n1} \cdot r_y$ $\qquad E_z := F_{n1} \cdot r_z$

$$A(r_x, r_y, r_z) := \begin{pmatrix} r_x \cdot 1 + 1 r_y \\ r_y + 1 \cdot r_x \\ r_z \end{pmatrix} \cdot F_{n1} \cdot i \qquad A(r_x, r_y, r_z) = \begin{pmatrix} 4.35974819753i \times 10^{-18} \\ 4.35974819753i \times 10^{-18} \\ 0 \times 10^{0} \end{pmatrix} J$$

The result is in the imaginary domain and imaginary power does not radiate. (Standing Wave)

$$a_x := \begin{pmatrix} 1 \\ 0 \\ 0 \end{pmatrix} \qquad a_y := \begin{pmatrix} 0 \\ 1 \\ 0 \end{pmatrix} \qquad a_z := \begin{pmatrix} 0 \\ 0 \\ 1 \end{pmatrix}$$

Here, curl is in the cartesian system of coordinates.

$$curl = \left(\frac{d}{dr_y} A_z - \frac{d}{dr_z} A_y\right) \cdot a_x + \left(\frac{d}{dr_z} A_x - \frac{d}{dr_x} A_z\right) \cdot a_y + \left(\frac{d}{dr_x} A_y - \frac{d}{dr_y} A_x\right) \cdot a_z$$

General form of curl in 3D. 166)

$$curl_x := \left(\frac{d}{dr_y} A(r_x, r_y, r_z)_2 - \frac{d}{dr_z} A(r_x, r_y, r_z)_1\right) \cdot a_x \qquad curl_x = \begin{pmatrix} 0 \times 10^{0} \\ 0 \times 10^{0} \\ 0 \times 10^{0} \end{pmatrix} N$$ 167)

$$curl_y := \left(\frac{d}{dr_z} A(r_x, r_y, r_z)_0 - \frac{d}{dr_x} A(r_x, r_y, r_z)_2\right) a_y \qquad curl_y = \begin{pmatrix} 0 \times 10^{0} \\ 0 \times 10^{0} \\ 0 \times 10^{0} \end{pmatrix} N$$ 168)

$$curl_z := \left(\frac{d}{dr_x} A(r_x, r_y, r_z)_1 - \frac{d}{dr_y} A(r_x, r_y, r_z)_0\right) \cdot a_z \qquad curl_z = \begin{pmatrix} 0 \times 10^{0} \\ 0 \times 10^{0} \\ -9.26442286059i \times 10^{-23} \end{pmatrix} N$$ 169)

170)

$$curl := curl_x + curl_y + curl_z \qquad curl = \begin{pmatrix} 0 \times 10^{0} \\ 0 \times 10^{0} \\ -9.26442286059i \times 10^{-23} \end{pmatrix} newton$$

The result is in the imaginary domain and is a force in the z direction.

$$\mu_o := 4 \cdot \pi \cdot 1 \cdot 10^{-07} \cdot henry \cdot m^{-1} \qquad \mu_o = 1.25663706144 \times 10^{-6} \frac{henry}{m}$$

171)

For electrogravitation:

$$F_{EG} := curl \cdot \mu_o \cdot curl \qquad F_{EG} = -1.07856569545 \times 10^{-50} newton \cdot \frac{henry}{m} \cdot newton$$

No longer a vector and is now a real negative force of Attraction

The conclusion is by using del (∇) cross A above, we manipulate the electric field force at the n1 energy level of the Hydrogen atom and arrive at the electrogravitational force between two electron charges. The force field is a standing wave which only appears to be a static force field.

$$F_{EG} = \nabla \times A \cdot (\mu_o) \cdot \nabla \times A$$ where curl is: $\nabla \times A$ and A is an energy vector. 172)

This method derives the magnetic force field from the electric force field and then further on, the electrogravitational field from two systems of magnetic force. It matters not that two newton terms are in the numerator of the electrogravitational force expression since they depend on the fact that the magnitude is derived from a $1/r^2$ aspect as shown above. By quantum superposition, only one newton in one system is engaged at a time in alternate fashion. The above operation yields a force in the z direction by a circulation of an energy field around that z axis in the xy plane.

The answers above for the magnetic and electrogravitational force fields are not exact. The Mathcad engine has trouble differentiating accurately at the small levels being examined. The answers act somewhat chaotic as small changes are made to the input variables. The best answers approach nominal when both restraint and tolerance values are made small in the math option settings. Also, note that 16-plus decimal places in the input variables help also.

That being said, the result suggests that the speed of light may be set by the above rotation of energy around an axis and that motional field process is also known as curl. Curl reduces the electric force to the magnetic force at the same radius of action. The action of curl simply reduces the force by geometric means. This is the long sought after top-down method I have been searching for for deriving the magnetic force directly from the electric force field and thus finally arriving directly at the electrogravitational force expression. Interestingly, an example of reduction of the electric force field by the H1n1 energy level velocity squared times G times the electric force field divided by the H1n1 energy level velocity squared yields the exact magnitude of the gravitational force in the single newton unit.

However, the magnetic force is not the correct magnitude or units to fit the electrogravitational equation. The final result is a re-stated form of the Newtonian equation for gravitational force.

$$v_{n1} := c \cdot \alpha \qquad v_{n1} = 2.18769208468 \times 10^{6} \frac{m}{s} \qquad G_k := 6.672590000 \cdot 10^{-11} \cdot N \cdot m^{2} \cdot kg^{-2}$$

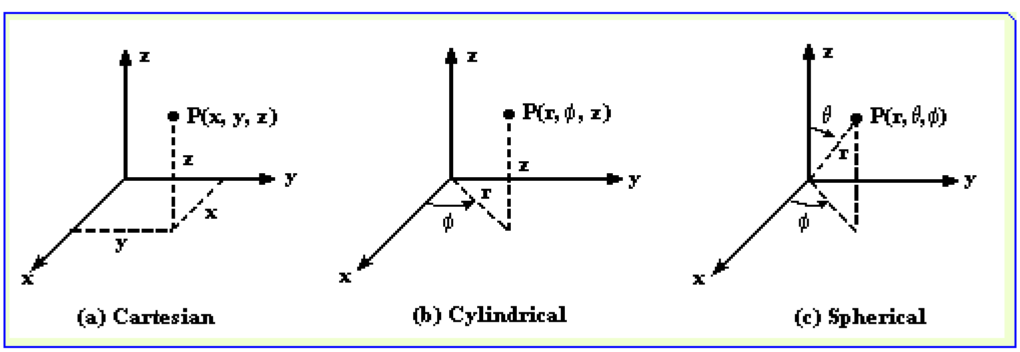
$$\frac{F_{n1}}{v_{n1}^{2}} = 1.72142399218 \times 10^{-20} \frac{kg}{m} \qquad \frac{F_{n1}}{v_{n1}^{2}} \cdot G_k \cdot \frac{F_{n1}}{v_{n1}^{2}} = 1.97728896894 \times 10^{-50} N \qquad 173)$$

It is thus suggested that the speed of light is what it is by the above explanation of how curl of energy reduces the electric force to the magnetic force without first invoking the speed of light as a reduction method. That is, the curl of the electric energy field sets the speed of light to what it is. I have never heard an explanation for why the speed of light is what it is other than what is presented above.

Rotation of an energy field (or matter) such as described above can explain such phenomena as high and low pressure zones in the atmosphere that cause wind and even hurricanes and tornadoes if the vertical gradient of temperature differential is great enough. Using the right hand rule, where the curled four fingers point in the direction of rotational motion, the thumb points in the direction of force. If the thumb points towards the viewer, the rotation is counterclockwise and it is a low pressure zone since the force vector is away from the Earth which creates a low pressure area and vis versa. This is the dynamic as seen on weather channels during weather reports. The math of curl above shows that the real electrogravitational force results in work which is energy expended. (Thus gravity is an entropic force.) It is proposed herein that although the temperature gradient acts as an initiator of the tornado action, energy is not extracted from the gradient: Energy is extracted from energy space. Then the energy expended is not only replaced by energy from energy space, it is boosted as time goes by as long as the temperature gradient is there to promote the process. The energy gradient acts as a control grid in a triode vacume tube or as the base in a transistor.

A graphic that shows the coordinate systems that pertain to curl is shown below.

Figure 5



The below solution for curl in the cylindrical system of coordinates is a sample sheet from Mathcad's ebook "Electromagnetics". (Values reworked for electrogravitational solution.)

Chapter 9 Magnetic Field and Curl

9.3 Magnetic Potential

$r := 5.291772490 \cdot 10^{-11}$ $\phi := \frac{3.000000000000001}{2} \cdot \pi \cdot \text{rad}$ $z := 0$

$$A_{cyl}(r,\phi) := \begin{pmatrix} r \cdot \sin(\phi) \\ 0 \\ 0 \end{pmatrix} \cdot \left(8.2387294725353 \times 10^{-8}\right) \cdot i$$

Cylindrical solution cannot have units since the statements for length and angle do not match.

$\phi = 2.7 \times 10^{2}\,\text{deg}$ (Standing wave) $A_{cyl}(r,\phi) = \begin{pmatrix} -4.35974819753i \times 10^{-18} \\ 0 \times 10^{0} \\ 0 \times 10^{0} \end{pmatrix}$ 174)

$\sin(\phi) = -1 \times 10^{0}$ $a_r := \begin{pmatrix} 1 \\ 0 \\ 0 \end{pmatrix}$ $a_\phi := \begin{pmatrix} 0 \\ 1 \\ 0 \end{pmatrix}$ $a_z := \begin{pmatrix} 0 \\ 0 \\ 1 \end{pmatrix}$ 175)

Solution The curl of **A** is given by:

$$curl_r := \left[\frac{1}{r} \cdot \left(\frac{d}{d\phi} A_{cyl}(r,\phi)_2\right) - \frac{d}{dz} A_{cyl}(r,\phi)_1\right] \cdot a_r \qquad curl_r = \begin{pmatrix} 0 \times 10^{0} \\ 0 \times 10^{0} \\ 0 \times 10^{0} \end{pmatrix}$$ 176)

$$curl_\phi := \left(\frac{d}{dz} A_{cyl}(r,\phi)_0 - \frac{d}{dr} A_{cyl}(r,\phi)_2\right) \cdot a_\phi \qquad curl_\phi = \begin{pmatrix} 0 \times 10^{0} \\ 0 \times 10^{0} \\ 0 \times 10^{0} \end{pmatrix}$$ 177)

$$\mathrm{curl}_z := \frac{1}{r}\cdot\left[\frac{d}{dr}\left(r\cdot A_{cyl}(r,\phi)_1\right) - \frac{d}{d\phi}A_{cyl}(r,\phi)_0\right]\cdot a_z \qquad \mathrm{curl}_z = \begin{pmatrix} 0\times 10^{0} \\ 0\times 10^{0} \\ -1.24839998584i\times 10^{-22} \end{pmatrix} \qquad 178)$$

$$\mathrm{curl} := \mathrm{curl}_r + \mathrm{curl}_\phi + \mathrm{curl}_z$$

$$\mathrm{curl} = \begin{pmatrix} 0\times 10^{0} \\ 0\times 10^{0} \\ -1.24839998584i\times 10^{-22} \end{pmatrix} \qquad \mathrm{curl}\cdot\mathrm{curl}\cdot 4\cdot\pi\cdot 1\cdot 10^{-07} = -1.95847203281\times 10^{-50} \qquad 179)$$

Again, the answers are not exact for the reasons stated in the Cartesian solutions above. However, they are close considering the built in limitations of the software.

Instead of del cross the magnetic vector potential, which yields the magnetic flux density B, we applied the method of curl to a vector energy field and the result allowed us to derive the magnetic force from the electric field force without resorting to reduction by the speed of light as explained above. Thus the speed of light is built into to process and was arrived at by purely geometric means. I think Einstein would have liked that.

A simplification of the curl is as follows: Curl simplified amounts to the inverse of distance or radius, especially if we are only considering one vector direction instead of three. Since del (∇) is now equivalent to 1/r, energy, which is force times distance, becomes force when multiplied by del. Likewise, the magnetic vector potential in (volt*sec)/meter becomes (volt*sec)/meter^2 which is tesla, or the magnetic flux density **B**. This is commonly stated as **B** = ∇ X **A** where **A** is the magnetic vector potential. In this case, the magnetic vector potential **A** circulates around an axis that is denoted as the **B** vector. For those of you who do not like the concept of superposition, or "spooky action at a distance", call Ghost Busters!

I suggest that Nicholas Geisens experiments with photons that proved instantaneous action at a distance does occur, He may also want to check for attraction between the entangled photons when one or the other is interfered with. This could be done by checking for a minute deflection at the target area.

The next topic is how there may be a transformation of the quantum of circulation in Heisenbergs uncertainty equation that leads directly to what I call the least quantum of energy.

The least quantum of circulation is in Heisenbergs equation as shown below.

$$kg \cdot \left(\frac{m}{sec} \cdot m \right) = joule \cdot sec \quad \text{and} \quad kg \cdot \left(\frac{m^2}{sec^2} \cdot sec \right) = joule \cdot sec \qquad 180)$$

The equation on the left is the statement involving momentum and wavelength while the equation on the right is for energy and time and both equations equal Planks constant although only the units are shown. The quantum of circulation is a constant and is expressed in magnitude and units as:

$$Q_C := 7.273896183 \cdot 10^{-04} \cdot m^2 \cdot sec^{-1}$$

A transformation from momentum to energy is accomplished by differentiating the quantum of circulation with respect to time and we arrive at a least quantum of energy.

$$\frac{d}{dt_{LM}} \left(\frac{\lambda_{LM}{}^2}{t_{LM}} \right) = -7.29735308629 \times 10^{-3} \frac{m^2}{sec^2} \text{where} \qquad \alpha = 7.297355308 \times 10^{-3} \qquad 181)$$

Then there can be two forms of the fine structure constant. One is without units and the other has units of meter squared per second squared and both have the same numerical magnitude. The transformation from one form to the other comes by way of a time perturbation of the least quantum of circulation and I liken this in a solid as Nyquist noise.

If we include the mass of the electron, we arrive at the least quantum of electromagnetic energy at the radius of the H1n1 energy level. (See eq. 82 through 84 above.)

$$E_{mag} := m_e \cdot \left(\frac{d}{dt_{LM}} \frac{\lambda_{LM}{}^2}{t_{LM}} \right) \cdot i \qquad E_{mag} = -6.64744329788i \times 10^{-33} \text{joule} \qquad 182)$$

Finally, the electrogravitational force between two electron masses at the radius r_{n1} of the H1n1 energy level of the Hydrogen atom is given as:

System 1 System 2

$$F_{EGn1} := \left[m_e \cdot \left[\left(\frac{d}{dt_{LM}} \frac{\lambda_{LM}{}^2}{t_{LM}} \right) \cdot i \cdot r_{n1}{}^{-2} \right] \right] \cdot \mu_o \cdot \left[m_e \cdot \left(\frac{d}{dt_{LM}} \frac{\lambda_{LM}{}^2}{t_{LM}} \right) \cdot i \right] \qquad 183)$$

The left and right-hand terms around μ_o are exchanging places

$$F_{EGn1} = -1.98297308078 \times 10^{-50} \frac{joule}{m^2} \cdot \frac{henry}{m} \cdot joule$$

The only variable is in the m^2 unit.

In equation 173 above, the system terms arrived at kilogram per meter and the two systems times the so called gravitational constant arrives at a value very close to the above magnitude but with a single newton term in the result. This is deceptively simple and as such leads us to think it is correct. Firstly, the gravitational constant is contrived so as to make the result what it is. The electrogravitational result does not contrive artificial unit structures to get a satisfying result. It is what it is and is arrived at through quantum constants as shown above. Secondly, in equation 173, the field is expressed in kilogram per meter terms. This is NOT a field. This so-called field is material and can be seen by the naked eye since it is MASS per unit meter.

Energy, on the other hand has many forms and can be expressed as a field such as an electric, magnetic, and even electromagnetic field.

So we see that the fine structure constant can have a static form as well as a dynamic form and both can be regarded as constant. The static form expresses ratios of magnitudes in the same units while the dynamic form is derived from the perturbation of time of the least quantum of circulation.

Finally, the superposition of systems 1 and 2 above is instantaneous. Thus electrogravitation is proposed to be a nearly instantaneous process if not actually instantaneous.

The beginning of this paper I introduced the scaling of the universe based on the quantum realm. It is fitting to end the paper the same way but deriving a scale that is based on the quantum force constant F_{QG} from above that could be located inside of a proton or neutron.

$F_{QG} = 2.96437145031 \times 10^{-17} N$ $\qquad E_{LM} := h \cdot f_{LM} \cdot i$ $\qquad E_{LM} = 6.6474433014i \times 10^{-33} J$ 184)

$r_{\lambda small} := \dfrac{E_{LM}}{F_{QG} \cdot 2 \cdot \pi}$ $\qquad r_{\lambda small} = 3.56896387i \times 10^{-17} m$ 185)

(Fits inside the neutron)

Neutron mass: $m_n := 1.67498600 \cdot 10^{-27} \cdot kg$

Neutron wavelength: $\lambda_n := \dfrac{h}{m_n \cdot c}$ $\qquad r_n := \dfrac{\lambda_n}{2 \cdot \pi}$ $\qquad r_n = 2.10012249772 \times 10^{-16} m$ 186)

$\dfrac{r_n}{16} \cdot e = 3.56795301444 \times 10^{-17} m$ which is extremely close to $r_{\lambda small}$ above. 187)

Thus we see that the electrogravitational force constant plays a role in the binding force of the neutron and perhaps even the proton since the proton wavelength is very close to the neutron's.

Finally: $\dfrac{l_q}{2 \cdot \pi \cdot r_{\lambda small} \cdot 4 \cdot \pi} = -9.9999999947i \times 10^{-1}$ where lq is the classic electron radius. 188)

Let us return to the two forms of Heisenberg's equations where: $t_{n1} := 1.519829860 \cdot 10^{-16} \cdot sec$

$$m_e \cdot \left[(v_{LM})^2 \cdot t_{LM} \right] = -6.6260754965 \times 10^{-34}\, joule \cdot sec \quad \text{(Time and energy)}$$ 189)

And:

$$m_e \cdot \left[(v_{LM}) \cdot \lambda_{LM} \cdot i \right] = -6.6260754965 \times 10^{-34}\, joule \cdot sec \quad \text{(Wavelength and momentum)}$$ 190)

The least quantum of circulation exists in both forms of the above equations as:

$$\left[(v_{LM})^2 \right] \cdot t_{LM} = -7.2738961895 \times 10^{-4} \frac{m^2}{s} \quad \text{and} \quad (v_{LM}) \cdot \lambda_{LM} \cdot i = -7.27389618949 \times 10^{-4} \frac{m^2}{s}$$ 191)

A transformation occurs from equation 190 when differentiated with respect to time as:

$$\frac{d}{dt_{LM}} m_e \cdot \frac{(\lambda_{LM} \cdot i)^2}{t_{LM} \cdot i} = -6.647744329788i \times 10^{-33} J \quad \text{where} \quad \frac{\lambda_{LM} \cdot i}{t_{LM} \cdot i} = 8.54245461579 \times 10^{-2} \frac{m}{s}$$ 192)

which is the least quantum velocity $v_{LM} = 8.5424546158i \times 10^{-2} \frac{m}{s}$

The energy $-6.647744329788i \times 10^{-33} J$ compares to $h \cdot f_{LM} = 6.6474433014 \times 10^{-33} J$ 193)

but is energy that is in the imaginary realm, is a vector, and is most likely a standing wave. As such, it is prime for being the action through energy space that creates the electrogravitational force. If we now differentiate the energy in equation 192 with respect to distance, we arrive at free field least quantum force.

$$\left[\frac{d}{d\lambda_{LM}} \left[\frac{d}{dt_{LM}} m_e \cdot \frac{(\lambda_{LM} \cdot i)^2}{t_{LM} \cdot i} \right] \right] \cdot \frac{1}{2} = -7.80674912096i \times 10^{-31} N$$ 194)

Dividing the energy by the radius of the H1n1 energy level of the Hydrogen atom, we arrive at the magnetic force of the same energy level which is the key force of either system regarding the electrogravitational force as presented above.

$$\left[\frac{d}{dt_{LM}} m_e \cdot \frac{(\lambda_{LM} \cdot i)^2}{t_{LM} \cdot i} \right] \cdot \left[\left(\frac{d}{dr_{n1}} r_{n1}^2 \right) \cdot \frac{1}{2} \right]^{-1} = -1.25618463576i \times 10^{-22} N$$ 195)

The Casimer force may be developed by the method above since *fluctuations in the background energy* of space is assumed to be the cause thereof.

It is possible to bring forth a geneses of the electric force at the H1n1 energy level as well as the associated magnetic force by perturbation of the quantum of circulation parameters. The forms of the quantum circulation necessary are shown below.

$$\frac{(\lambda_{n1})^2}{t_{n1}} = 7.27389162323 \times 10^{-4} \frac{m^2}{s} \quad \text{and} \quad \frac{\lambda_{LM}^2}{t_{LM}} = 7.27389618949 \times 10^{-4} \frac{m^2}{s} \qquad 196)$$

Both of the above equations are equal to the quantum of circulation. We will put Mathcad's symbolic solver engine to work and solve for a combined perturbation of time and wavelength in the H1n1 energy level of the Bohr Hydrogen atom using the quantum of circulation on the upper left above.

$$\frac{d}{dt_{n1}}\left[\frac{d}{d\lambda_{n1}}\frac{(\lambda_{n1})^2}{t_{n1}}\cdot m_e\right]\pi \quad \text{yields} \quad -2\cdot\frac{\lambda_{n1}}{t_{n1}^2}\cdot m_e\cdot\pi = -8.23872683146 \times 10^{-8} N \qquad 197)$$

This is a force of attraction which is equal but opposite in sign to the standard field equation:

$$FE_{n1} := q_o^2\cdot\left(4\cdot\pi\cdot\varepsilon_o\cdot r_{n1}^2\right)^{-1} \qquad FE_{n1} = 8.23872947254 \times 10^{-8} N \qquad 198)$$

The magnetic force at the H1n1 energy level of the Bohr Hydrogen atom is derived in much the same manner as above. (Using Mathcad's symbolics solver.)

$$\frac{d}{d\lambda_{LM}}\frac{\lambda_{n1}\cdot\lambda_{LM}}{t_{n1}\cdot t_{LM}}\cdot m_e\cdot 2\cdot\pi \quad \text{yields} \quad 2\cdot\frac{\lambda_{n1}}{t_{n1}\cdot t_{LM}}\cdot m_e\cdot\pi = 1.25618423235 \times 10^{-22} N \qquad 199)$$

In the above, only the quantum electrogravitational distance is perturbed as shown.

The main geometric frequency of this fundamental magnetic quantum force is:

$$\left(\sqrt{t_{n1}\cdot t_{LM}}\right)^{-1} = 2.56922207245 \times 10^{8} Hz$$ This frequency will interact with both times. 200)

Thus, out of a marrying of the two forms of the quantum circulation constant shown above, we can derive the quantum magnetic force that leads directly to the final result of electrogravitational force as discussed previously in the above paper.

Then using Hydrogen, separated by the electrogravitational wavelength of λ_{LM} and the frequency of 256.922207245 MHz, we should cause interesting things to happen to ordinary water.

End of Paper

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