Photon/Atomic/Electrogravitational Energy Master Equation

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The expansion of the electrogravitational phase dependent force equation of chapter 7 of my book, (equation 236 on page 123), "Electrogravitation As A Unified field Theory," has yielded some very interesting results that apply directly to what makes up the electron as well as the hidden Extreme Low Frequencies that are connected to the electron and the energy levels (shells) in the atomic realm.

The phase dependent force equation suggests that huge external field forces may either attract or repel depending on the phase of the electrons internal capacitive and inductive geometry. Also, the equation outputs reveal that the main energy result is negative and imaginary. The negative energy result agrees with the standard concept of the energy levels of the atoms wherein the negative energy level signifies the amount of binding to the nuclear center of the atom. The highest negative energy is thus the energy shell closest to the atomic nucleus. Therefore, it requires the largest amount of energy to raise the electron nearest the nucleus to a non-binding distance from the nucleus. An incoming photon having enough positive energy would add its positive energy to the negative energy in a given atomic shell which would reduce that shells negative energy. This would <u>instantly</u> move the electron to a distance farther from the atomic nucleus. (Into a less negative energy shell, which is equivalent to saying into a higher positive potential energy shell.)

The imaginary state of the energy result from the master equation indicates that the energy in that state is mostly reactive, meaning that it represents a standing wave and abides in a closed loop transmission line geometry. Therefore, it does not radiate, although it may make its character known at a distance through David Bohm's magnetic vector potential as well as the electric scalar potential. The word "imaginary" does not mean that the energy or interaction field does not exist. It means that the energy is not subject to radiation in the free field sense. A non-imaginary energy is therefore a real energy field that could represent a radiative electromagnetic wave, or photon.

It has been established that the simple Bohr atomic theory cannot explain atoms much more complex that the Hydrogen atom. The measurement of the actual emitted spectrum had to be explained in terms of probability theory and via the Schrodinger wave equation, nearly all of the atomic spectra is predictable. The output from the Schrodinger wave equation contains imaginary as well as real energy results.

The expanded electrogravitational phase dependent force equation presented in this paper also has real and imaginary energy results. The real energy result is negative and the equivalent frequency is in the extreme low frequency, (ELF), realm. This ranges from a few thousandths of a Hz to a few kilohertz, and the fact that the energy is negative suggests that it has a far field cooling effect over time. Further, the energy being real suggests that it radiates. Therefore, it must be replenished through some process that connects the overall action to what I call energy space. This also suggests that if the mechanism can be manipulated properly, energy space could be tapped into and real energy could be brought into our normal space.

If a large craft is constructed based on the hypothetical parameters belonging to the mechanics of the electron being a standing wave of energy, we could easily cause the craft to jump through space (just as the electron does) when an adjustment to its phase parameters would cause a corresponding adjustment to its standing-wave energy state. Then the electron takes in energy from energy space and jumps to another point in space. By proper rotation of a standing wave field, the geometry of a very large atom is created with standing wave energy shells surrounding the craft that are themselves rotating. It is into the distant shells that the craft would jump to. The actual design is presented in the following text of this paper.

It may well be that extreme low frequency negative energy radiation is all around us and that the total combined energy of all of the radiation from matter in the universe creates a field that could be called dark matter. Also, negative energy ELF fields would subtract energy from all positive energy matter. Thus the Hubbell redshift may not indicate expansion of the universe.

Let the following constants be stated for the purpose of computations regarding the analysis of the electrogravitational formulas presented below. Note that these are in SI units.

The boldface constants are derived from my theory. This document prepared with Mathcad 6.0+ software and all results are units checked.

$h := 6.626075500\cdot 10^{-34}\cdot joule\cdot sec$	Planks constant.
$G := 6.672590000\cdot 10^{-11}\cdot newton\cdot m^{2}\cdot kg^{-2}$	Gravitational constant.
$m_{e} := 9.109389700\cdot 10^{-31}\cdot kg$	Electron rest mass.
$R_{Q} := 2.581280560\cdot 10^{04}\cdot ohm$	Quantum Hall Ohm.
$l_{q} := 2.817940920\cdot 10^{-15}\cdot m$	Classic electron radius.
$\varepsilon_{o} := 8.854187817\cdot 10^{-12}\cdot farad\cdot m^{-1}$	Electrical permittivity of free space.
$\mu_{o} := 1.256637061\cdot 10^{-06}\cdot henry\cdot m^{-1}$	Magnetic permeability of free space.
$r_{n1} := 5.291772490\cdot 10^{-11}\cdot m$	Bohr n1 radius
$c := 2.997924580\cdot 10^{08}\cdot m\cdot sec^{-1}$	Velocity of light in free space.
$r_{x} := r_{n1}$	Variable r_x preset to Bohr n1 orbital radius.
$q_{o} := 1.602177330\cdot 10^{-19}\cdot coul$	Basic electron charge.
$L_{Q} := 2.572983215822382\cdot 10^{3}\cdot henry$	**Quantum Electrogravitational Inductance.**
$C_{Q} := 3.86159328077508\cdot 10^{-06}\cdot farad$	**Quantum Electrogravitational Capacitance.**
$r_{LM} := 1.355203611\cdot 10^{-03}\cdot m$	**Quantum Electrogravitational radius.**
$f_{LM} := 1.003224805\cdot 10^{1}\cdot Hz$	**Quantum electrogravitational frequency.**
$t_{LM} := f_{LM}^{-1}$	**Quantum electrogravitational time.**
$v_{LM} := 8.542454612\cdot 10^{-02}\cdot m\cdot sec^{-1}$	**Quantum electrogravitational velocity.**
$i_{LM} := q_{o}\cdot t_{LM}^{-1}$	**Quantum electrogravitational current unit.**

Also; $\theta := \frac{\pi}{2}$ $\phi := \frac{\pi}{2}$ and; $\omega_{LM} := 2\cdot\pi\cdot f_{LM}$

$A := \sin(\theta)$ $B := \sin(\phi)$ $A = 1$ $B = 1$

For the sake of comparing the absolute magnitude results during the following analysis, the forces derived will be considered as the gravitational equivalent force between the mass of two electrons at the Rn1 radius of the n1 orbital of the Bohr atom of Hydrogen. Then the force calculated by means of the standard gravitational equation is given as:

$$F_{gravity} := \frac{G \cdot m_e \cdot m_e}{r_x^2} \quad \text{where} \quad F_{gravity} = 1.977291388968519 \cdot 10^{-50} \cdot newton$$

Established below is the new equation for mass that relates charge, magnetic permeability, and the classic electron radius to the standard rest mass of the electron.

$$mass_{electron} := \frac{\mu_o \cdot q_o^2}{4 \cdot \pi \cdot l_q} \quad \text{or,} \quad mass_{electron} = 9.109389688253174 \cdot 10^{-31} \cdot kg$$

where the standard SI value for the electron rest mass is given as: $m_e = 9.109389700000001 \cdot 10^{-31} \cdot kg$

The new electrogravitational action equation is now stated below as:

System 1 System 2 Note the equalities exist below as:

$$F_{eg} := \left(\frac{\mu_o \cdot q_o^2 \cdot v_{LM}^2}{4 \cdot \pi \cdot l_q \cdot r_x}\right) \cdot \mu_o \cdot \left(\frac{\mu_o \cdot q_o^2 \cdot v_{LM}^2}{4 \cdot \pi \cdot l_q \cdot r_x}\right) \qquad \left(\frac{\mu_o \cdot q_o^2 \cdot v_{LM}^2}{4 \cdot \pi \cdot l_q \cdot r_x}\right) = \left(\frac{L_Q \cdot i_{LM}^2}{r_x}\right) = \left(\frac{m_e \cdot v_{LM}^2}{r_x}\right)$$

or,

$$F_{eg} = 1.982973075196837 \cdot 10^{-50} \cdot newton \cdot \frac{henry}{m} \cdot newton$$ at r_x = Rn1.

The above formula may be stated in terms of L_Q and C_Q and the quantum current i_{LM} as is shown next. (Force polarity is not corrected yet.)

$$F'_{eg} := \left[\frac{L_Q \cdot \left(i_{LM}^2\right) \cdot A \cdot B}{r_x}\right] \cdot \mu_o \cdot \left[\frac{C_Q \cdot R_Q^2 \cdot \left(i_{LM}^2\right) \cdot A \cdot B}{r_x}\right]$$

The result at the left is by reason of transmission path (line) impedance is given by:

$$R_Q := \sqrt{\frac{L_Q}{C_Q}}$$

where:

or, $$F'_{eg} = 1.982973070535905 \cdot 10^{-50} \cdot newton \cdot \frac{henry}{m} \cdot newton$$

The above may be expressed in terms of inductive and capacitive reactances in the following;

Let; $X_L := \omega_{LM} \cdot L_Q$ $\qquad X_C := \dfrac{1}{\omega_{LM} \cdot C_Q}$

where; $X_L = 1.621866424513917 \cdot 10^5 \cdot ohm$

and, $X_C = 4.108235582859004 \cdot 10^3 \cdot ohm$

then also arranging the above expressions for C_Q and L_Q;

$$L_Q = \frac{X_L}{\omega_{LM}} \qquad C_Q = \frac{1}{X_C \cdot \omega_{LM}}$$

Inserting the above expressions for the quantum inductive and capacitive reactances into the above equation with the proper phasor form of X_L and X_C we arrive at the next equation:

Source Receptor

$$F''_{eg} := \left[\frac{X_L \cdot e^{j\cdot\left(\frac{\pi}{2}\right)}\cdot\left(i_{LM}\right)^2}{\omega_{LM}\cdot r_x}\cdot A\cdot B\right]\cdot\mu_o\cdot\left[\frac{R_Q\cdot\left[R_Q\cdot\left(i_{LM}\right)^2\right]}{X_C\cdot e^{j\cdot\left(-\frac{\pi}{2}\right)}\cdot\omega_{LM}\cdot r_x}\cdot A\cdot B\right]$$ where,

or the quantum electrogravitational force in terms of the proper reactive signs is:

$$F''_{eg} = -1.982973078392333\cdot 10^{-50} + 2.42836143125797\cdot 10^{-66}j \quad \cdot newton\cdot\frac{henry}{m}\cdot newton$$

where: $$X_L\cdot e^{j\cdot\left(\frac{\pi}{2}\right)} = 9.93073964255462\cdot 10^{-12} + 1.621866424513917\cdot 10^{5}j \quad \cdot ohm$$

and: $$X_C\cdot e^{j\cdot\left(-\frac{\pi}{2}\right)} = 2.515485698884157\cdot 10^{-13} - 4.108235582859004\cdot 10^{3}j \quad \cdot ohm$$

Note that multiplying the source side of the equation above by X_L and dividing the receptor side by X_L, the equation below is obtained.

Source Receptor

$$F'''_{eg} := \left[\frac{\left[X_L\cdot e^{j\cdot\left(\frac{\pi}{2}\right)}\right]^2\cdot\left(i_{LM}\right)^2}{\omega_{LM}\cdot r_x}\cdot A\cdot B\right]\cdot\mu_o\cdot\left[\frac{R_Q\cdot\left[R_Q\cdot\left(i_{LM}\right)^2\right]}{X_L\cdot e^{j\cdot\left(\frac{\pi}{2}\right)}\cdot X_C\cdot e^{j\cdot\left(-\frac{\pi}{2}\right)}\cdot\omega_{LM}\cdot r_x}\cdot A\cdot B\right]$$

where again;

$$F'''_{eg} = -1.982973078392332\cdot 10^{-50} + 2.42836143125797\cdot 10^{-66}j \quad \cdot newton\cdot\frac{henry}{m}\cdot newton$$

The receptor side of the above equation now contains two cotangent forms of R_O/X_L and R_O/X_C that represent two interaction angles that can be made independent of the angular frequency of the interaction. The cotangent ratios are:

$$\frac{R_Q}{X_L} = 0.159154941868105 \qquad \frac{R_Q}{X_C} = 6.283185355492878$$

where the arctan of the inverse ratio will yield the phase angles:

$$\phi' := \operatorname{atan}\left(\frac{X_L}{R_Q}\right) \qquad \phi'' := -\operatorname{atan}\left(\frac{X_C}{R_Q}\right)$$

$$\phi' = 80.95693898934806\cdot deg \qquad \phi'' = -9.04306101065192\cdot deg$$

Where, $\cot(\phi')\cdot\cot(\phi'') = -1$

Check;

$\cot(\phi') = 0.159154941868105$ $\quad\quad \cot(\phi'') = -6.283185355492877$

This has the effect of rotating the first quadrant clockwise by ϕ" degrees which is in a negative time direction. (Counterclockwise is always in the positive and increasing time direction.) This represents a definite power loss and an increase in total system entropy. The previous equation may now be put in the form of the below equation where the cotangent ratios may be expressed as angles.

Source $\quad\quad\quad\quad$ Receptor

$$F''''_{eg} := \left[\frac{X_L\cdot e^{j\cdot\left(\frac{\pi}{2}\right)}\cdot\left(i_{LM}\right)^2}{\omega_{LM}\cdot r_x}\cdot A\cdot B\right]\cdot\mu_o\cdot\left[\frac{\cot(\phi')\cdot\cot(\phi'')\cdot X_L\cdot e^{j\cdot\left(\frac{\pi}{2}\right)}\cdot\left(i_{LM}\right)^2}{\omega_{LM}\cdot r_x}\cdot A\cdot B\right] \quad \text{where, } (\cot(\phi')\cdot\cot(\phi'')) = -1$$

$$F''''_{eg} = 1.982973078392333\cdot10^{-50} - 2.42836143125797\cdot10^{-66}j \quad \cdot\text{newton}\cdot\frac{\text{henry}}{\text{m}}\cdot\text{newton}$$

It must be emphasized that now the electrogravitational force expression contains the cotangent functions that can be made independent of frequency so that any L, C, or R may be utilized so long as the reactive ratios are preserved for a given angular frequency of consideration. In other words, the electrogravitational interaction force is controlled in the receptor by the phase angles ϕ' and ϕ" which may be altered by means of suitable phase shifting techniques.

More specifically, ϕ" can be most easily altered to reverse the polarity of the total interaction force sign by altering the capacitive reactance, (through planar varactor diode action), where the planar surface is a capacitive plate layered with an insulating surface. The planar surface has a series of conductive dots etched upon an insulating surface which then forms a transmission line capable of emulating a coil that has a variable capacitor action to its ground plane surface. These dots would be charged in rapid sequence to emulate an actual circular-moving current if desired.

For the purpose of symmetry of action, It is possible to use the right side of the electrogravitational action equation in the left side also such that both sides have the same terms. (See below.) Now both systems have the same parameters. In general this should apply to all systems of electrogravitational interaction.

Then for an interaction distance at the n1 Bohr orbital of Hydrogen:

System 1 $\quad\quad\quad\quad$ System 2

$$FG := \left[\frac{\cot(\phi')\cdot\cot(\phi'')\cdot X_L\cdot e^{j\cdot\left(\frac{\pi}{2}\right)}\cdot\left(i_{LM}\right)^2}{\omega_{LM}\cdot r_x}\cdot A\cdot B\right]\cdot\mu_o\cdot\left[\frac{\cot(\phi')\cdot\cot(\phi'')\cdot X_L\cdot e^{j\cdot\left(\frac{\pi}{2}\right)}\cdot\left(i_{LM}\right)^2}{\omega_{LM}\cdot r_x}\cdot A\cdot B\right]$$

or; $\quad FG = -1.982973078392333\cdot10^{-50} + 2.42836143125797\cdot10^{-66}j \quad \cdot\text{newton}\cdot\frac{\text{henry}}{\text{m}}\cdot\text{newton}$

Please note that the sign of the FG equation above is now one of attraction, (-), and is real.

Note:

$$E_{Sys} := \left[\frac{\cot(\phi')\cdot\cot(\phi'')\cdot X_L\cdot e^{j\cdot\left(\frac{\pi}{2}\right)}\cdot\left(i_{LM}\right)^2}{\omega_{LM}}\cdot A\cdot B\right]$$

$$E_{Sys} = -4.070250647884233\cdot 10^{-49} - 6.647443295030629\cdot 10^{-33}j \quad \cdot m\cdot newton$$

The individual system least quantum energy , (1 or 2), above is standing wave (imaginary) while the total gravitational action involving two linked systems has a real negative major resulting force, not imaginary. The least quantum electrogravitational frequency related to the energy E_{Sys} is given by the equation below.

$$f_{Sys} := \frac{E_{Sys}}{h} \qquad \text{or,} \qquad f_{Sys} = -6.142777346687694\cdot 10^{-16} - 10.03224804038323j \quad \cdot Hz$$

The above equation shows that the right hand term is the electrogravitational frequency, f_{LM} , and is a negative imaginary number. Thus it does not radiate as a photon but makes its action known through the vector magnetic potential or scalar electric potential of David Bohms action, which cannot be shielded against.

The basic quantum force interaction between two systems involving the electrogravitational frequency f_{Sys} is shown below for a force interaction result between two electrons at the Rn1 shell of the Bohr atom.

$$F_{fLM} := \frac{h\cdot f_{Sys}}{r_x}\cdot\mu_o\cdot\frac{h\cdot f_{Sys}}{r_x}$$

Note that this is the same result as the FG equation result on the bottom of the previous page.

or, $$F_{fLM} = -1.982973078392333\cdot 10^{-50} + 2.42836143125797\cdot 10^{-66}j \quad \cdot newton\cdot\frac{henry}{m}\cdot newton$$

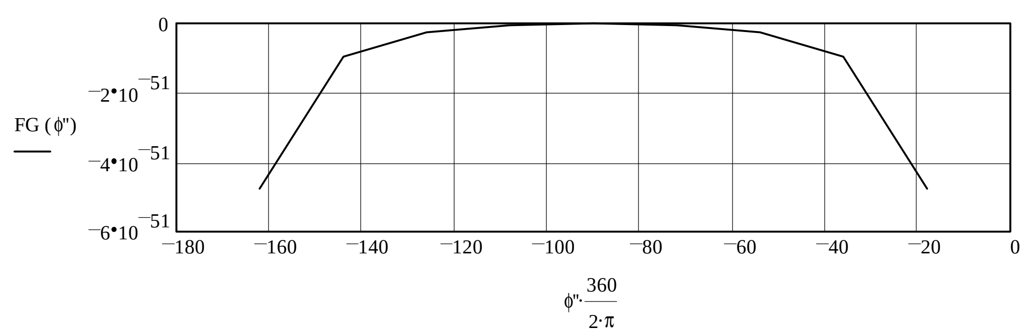
A very interesting aspect of the above equation is the possibility of the capacitive related cot(ϕ'') of both system 1 and 2 being coherently connected, or many systems being coherently connected, as in a star. If all systems in a star were to suddenly shift their phase angle (ϕ'') in the same direction, the result may be the sudden creation of a supernova.

For example, let $\phi'' := -0.1\cdot\pi, -0.2\cdot\pi .. -0.9\cdot\pi$ then:

System 1 System 2

$$FG(\phi'') := \left[\frac{\cot(\phi')\cdot\cot(\phi'')\cdot X_L\cdot e^{j\cdot\left(\frac{\pi}{2}\right)}\cdot\left(i_{LM}\right)^2}{\omega_{LM}\cdot r_x}\cdot A\cdot B\right]\cdot\mu_o\cdot\left[\frac{\cot(\phi')\cdot\cot(\phi'')\cdot X_L\cdot e^{j\cdot\left(\frac{\pi}{2}\right)}\cdot\left(i_{LM}\right)^2}{\omega_{LM}\cdot r_x}\cdot A\cdot B\right]$$

The above yields the plot:



The above plot shows 0 gravitational force attraction at -90 degrees. This would be disastrous for a star. The nuclear explosions that are held together by the gravitational force would cause an immediate supernova. Then a pulsar would be a star that is *bordering* on coherent loss of gravitational action.

If just system 1 or system 2 of the two system interaction were to have a variable phase related to the capacitive phase parameter, we can plot the result below. (This would be for the purpose of electrogravitational propulsion.)

Let: $\phi''' := -0.1\cdot\pi, -0.2\cdot\pi .. -0.9\cdot\pi$ Also restoring $\phi'' := -\operatorname{atan}\left(\frac{X_C}{R_Q}\right)$

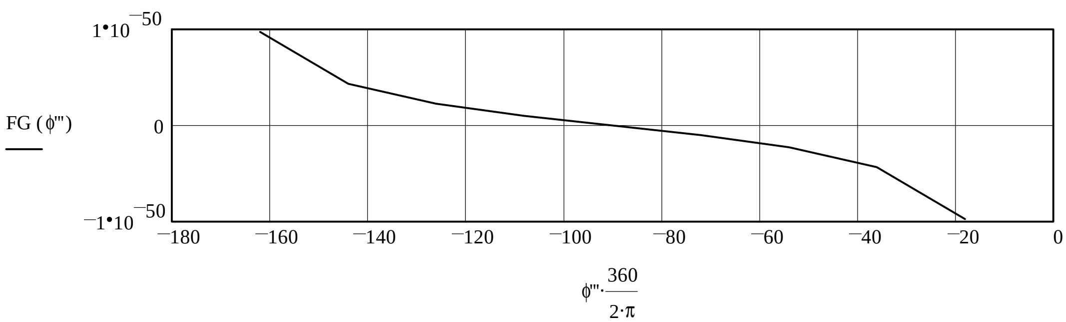
Then:

System 1 System 2, variable phase

$$FG(\phi''') := \left[\frac{\cot(\phi')\cdot\cot(\phi'')\cdot X_L\cdot e^{j\cdot\left(\frac{\pi}{2}\right)}\cdot\left(i_{LM}\right)^2}{\omega_{LM}\cdot r_x}\cdot A\cdot B\right]\cdot\mu_o\cdot\left[\frac{\cot(\phi')\cdot\cot(\phi''')\cdot X_L\cdot e^{j\cdot\left(\frac{\pi}{2}\right)}\cdot\left(i_{LM}\right)^2}{\omega_{LM}\cdot r_x}\cdot A\cdot B\right]$$

Note that only the right side of the above equation is changing related to capacitive phase, (Via ϕ''').

Then:



The force goes from one of attraction to one of repulsion as the phase goes from near 0 to near -180 degrees (right to left) with zero force being at -90 degrees. Again, it is not the magnitude of the parameters, but the system number 2 phase , (ϕ'''), of the interaction that controls the polarity and magnitude of the total system interaction. This is in agreement with what one would expect for a quantum interaction where the time related parameters control the energy.

Since the above equations have the quantum inductance L_O and the quantum capacitance C_O parameters, we can see that there is a definite phase difference relationship between the angle related to the inductive properties and that angle related to the associated transmission line capacitive properties. This angle difference is 90 degrees in the normal mode of interaction. For a transmission line, this is a situation of maximum standing wave ratio. We will have a condition of maximum and minimum potential, (as well as maximum and minimum current), separated 90 degrees timewise. I propose that this condition is equivalent to rest mass energy. In otherwords, particle *rest mass* is standing wave energy that does not radiate. (Electrical standing waves do not radiate through normal space). However, the associated scalar electric and vector magnetic potentials do convey the nature of the particle, perhaps at superluminal velocities. The nature of the particle (such as its velocity) may then also be related to the Schrodinger wave equation. David Bohm's quantum potential and his equation of motion in relationship to the vector potential is well established.

My FG electrogravitational equation presented above can be restated in terms of the vector magnetic potential, (**A**), and is presented below.

First we define the **electrogravitational wavelength:** $\lambda_{LM} := 2\cdot\pi\cdot r_{LM}$

Then:

(A) variable weber/meter	$F_{constant}$ |----------constant newton----------| (amp) (amp)	(A) variable weber/meter

$$F_{EG} := \left(\frac{\mu_o\cdot i_{LM}\cdot\lambda_{LM}}{4\cdot\pi\cdot r_x}\right)\cdot\left[\left(\frac{i_{LM}\cdot\lambda_{LM}}{l_q}\right)\cdot\mu_o\cdot\left(\frac{i_{LM}\cdot\lambda_{LM}}{l_q}\right)\right]\cdot\left(\frac{\mu_o\cdot i_{LM}\cdot\lambda_{LM}}{4\cdot\pi\cdot r_x}\right)$$

Or: $F_{EG} = 1.982973079530479\cdot 10^{-50}\cdot\frac{weber}{m}\cdot newton\cdot\frac{weber}{m}$

Which can also be expressed as:

$$F_{EG} = 1.982973079530479\cdot 10^{-50}\cdot newton\cdot\frac{henry}{m}\cdot newton$$

which is the same absolute magnitude as the previous electrogravitational results for the force at the R_{n1} radius of Hydrogen between two electrons. The force constant implies a power constant if multiplied by c, the velocity of light. Then the electrogravitational equation as presented above also has the mechanics of the vector magnetic potential. which cannot be shielded against.

How the ratio of the electrons free space impedance to its inner quantum space impedance determines the first atomic level, (as well as the photon coupling constant), is of interest. **First, however, the rest mass energy of the electron is derived using only the equation for system 1 or 2 below**. For the purpose of the following analysis let the following be stated:

Plank's constant: $h := 6.626075500\cdot 10^{-34}\cdot joule\cdot sec$

Then the quantum electron time is: $t_e := \frac{h}{m_e\cdot c^2}$ where, $t_e = 8.09330099961637\cdot 10^{-21}\cdot sec$

The current related to charge and time is: $i_e := \frac{q_o}{t_e}$ where, $i_e = 19.79633934380971\cdot amp$

The frequency f_e is: $f_e := \frac{1}{t_e}$ where, $f_e = 1.23558977980357\cdot 10^{20}\cdot Hz$

Then: $$E_{equiv} := \frac{\cot(\phi')\cdot\cot(\phi'')\cdot X_L\cdot e^{j\cdot\left(\frac{\pi}{2}\right)}\cdot\left(i_e\right)^2}{2\cdot\pi\cdot f_e}$$ **(Equivalent electron rest mass energy.)**

or, $E_{equiv} = -5.012994173090265\cdot 10^{-30} - 8.187111160158774\cdot 10^{-14}j\ \cdot joule$

Note the major energy result is imaginary, (suggesting a standing wave condition), and negative.

and also, $\phi' = 80.95693898934806\cdot deg$ and $\phi'' = -9.04306101065192\cdot deg$

Compare this with the actual electron rest mass energy:

$E_{standard} := m_e\cdot c^2$ where $E_{standard} = 8.187111168006826\cdot 10^{-14}\cdot joule$

Note below that there is a complex frequency result associated with the above E_{equiv} energy:

$$f_{me} := \frac{E_{equiv}}{h} \quad \text{where,} \quad f_{me} = -7.56555546807498 \cdot 10^{3} - 1.23558977861915 \cdot 10^{20} j \cdot \text{Hz}$$

Then the electron has a calculated subtractive real (-) energy related ELF frequency of approximately -7.56 KHz and is geometrically equal to a standing wave in the imaginary part which agrees with my earlier postulates. We will see below that the ELF energy subtractive concept also applies to the energy related frequencies of energy differentials related to the atomic shells of atoms in general. This will cause far-field cooling and thus may also be related directly to the electrogravitational action.

It is possible to state the case for the electron having a quantum potential energy, (via changing ϕ''), that could be very large. Large enough to have the self-energy predicted by David Bohm's quantum potential Q. Note that this energy is standing wave energy. This is also the type of energy required for a quantum jump.

It is of interest that by carefully adjusting the phase angle, we can obtain the field energy in the energy levels (shells) of atoms. Let the atomic space electromagnetic impedance R_S be defined below as:

where, $n := 1$ (n reduces R_S inversely as the orbital #.)

$z := 1$ (equal to atomic nuclear charge.)

Then: $$R_S := \frac{z \cdot \mu_o \cdot c}{2 \cdot n}$$

thus: $R_S = 188.3651566655429 \cdot \text{ohm}$

where: $X_L = 1.621866424513917 \cdot 10^{5} \cdot \text{ohm}$ and $X_C = 4.108235582859004 \cdot 10^{3} \cdot \text{ohm}$

Then: $$\frac{X_L}{R_S} = 861.0225230739823 \qquad \frac{X_C}{R_S} = 21.80995495973546$$

$$\phi' := \text{atan}\left(\frac{X_L}{R_S}\right) \quad \phi' = 89.9334561498496 \cdot \text{deg} \qquad \phi'' := -\text{atan}\left(\frac{X_C}{R_S}\right) \quad \phi'' = -87.37479148370825 \cdot \text{deg}$$

In the above, R_S is inversely proportional to n, the atomic electron energy level, and directly proportional to z, the atomic nuclear charge number. Now let the following parameters be established:

$$i_e := q_o \cdot f_e \quad \text{or,} \quad i_e = 19.79633934380971 \cdot \text{amp} \qquad \lambda_e := \frac{c}{f_e} \quad \text{or,} \quad \lambda_e = 2.426310600008849 \cdot 10^{-12} \cdot \text{m}$$

Then:

$$E_n := \frac{\cot(\phi') \cdot \cot(\phi'') \cdot X_L \cdot e^{j \cdot \left(\frac{\pi}{2}\right)} \cdot (i_e)^2}{4 \cdot \pi \cdot f_e}$$

where:

$$\cot(\phi') \cdot \cot(\phi'') = -5.325136188587006 \cdot 10^{-5}$$

And where: $E_n = -1.334743834214938 \cdot 10^{-34} - 2.179874095947301 \cdot 10^{-18} j \cdot \text{joule}$

$$f_n := \frac{E_n}{h} \qquad f_n = -0.201438066049042 - 3.289841922186522 \cdot 10^{15} j \cdot \text{Hz}$$

Then: Normal energy (absolute) expected is: Where: $R_S = 188.3651566655429 \cdot \text{ohm}$

$$E_{nx} := \frac{m_e \cdot c^2}{2} \cdot \left(\frac{R_S}{R_Q}\right)^2 \quad E_{nx} = 2.179874098036759 \cdot 10^{-18} \cdot \text{joule}$$

where, $$f_{nx} := \frac{E_{nx}}{h} \qquad f_{nx} = 3.289841925339908 \cdot 10^{15} \cdot \text{Hz}$$

Please note, however, that the energy radiated or absorbed from an atom is related to the energy differential between the respective electron energy levels inside an atom. For the purpose of examining this mechanism, let the following new parameters be established:

$$nl := 1 \qquad nh := 2 \qquad z' := 1 \qquad R'_S := \frac{z' \cdot \mu_o \cdot c}{2 \cdot nl} \qquad R''_S := \frac{z' \cdot \mu_o \cdot c}{2 \cdot nh}$$

In the above, nl is the lower energy level and nh is the higher energy level. Then the following is also established:

$$\phi l' := \operatorname{atan}\left(\frac{X_L}{R'_S}\right) \quad \phi l' = 89.9334561498496 \cdot deg \qquad \phi l'' := -\operatorname{atan}\left(\frac{X_C}{R'_S}\right) \quad \phi l'' = -87.37479148370825 \cdot deg$$

$$\phi h' := \operatorname{atan}\left(\frac{X_L}{R''_S}\right) \quad \phi h' = 89.96672806370491 \cdot deg \qquad \phi h'' := -\operatorname{atan}\left(\frac{X_C}{R''_S}\right) \quad \phi h'' = -88.68670648019329 \cdot deg$$

Then the energy differential between any two levels of the simple Bohr atom is given by:

$$E_{Dn} := \frac{\cot(\phi l') \cdot \cot(\phi l'') \cdot X_L \cdot e^{j \cdot \left(\frac{\pi}{2}\right)} \cdot (i_e)^2}{4 \cdot \pi \cdot f_e} - \frac{\cot(\phi h') \cdot \cot(\phi h'') \cdot X_L \cdot e^{j \cdot \left(\frac{\pi}{2}\right)} \cdot (i_e)^2}{4 \cdot \pi \cdot f_e}$$

or, $E_{Dn} = -1.001057875661205 \cdot 10^{-34} - 1.634905571960478 \cdot 10^{-18} j \quad \cdot joule$

$$f_{Dn} := \frac{E_{Dn}}{h} \qquad f_{Dn} = -0.151078549536782 - 2.467381441639894 \cdot 10^{15} j \quad \cdot Hz$$

$$f_{standard} := \frac{m_e \cdot q_o^{\,4} \cdot z'^2}{8 \cdot \varepsilon_o^{\,2} \cdot h^3} \cdot \left(\frac{1}{nl^2} - \frac{1}{nh^2}\right) \qquad f_{standard} = 2.467381403387264 \cdot 10^{15} \cdot Hz$$

[$f_{standard}$ from p. 741 of Modern University Physics.] [1]

A quick check of the above results is given below:

$$El := \frac{m_e \cdot c^2}{2} \cdot \left(\frac{R'_S}{R_Q}\right)^2 \qquad El = 2.179874098036759 \cdot 10^{-18} \cdot joule$$

$$Eh := \frac{m_e \cdot c^2}{2} \cdot \left(\frac{R''_S}{R_Q}\right)^2 \qquad Eh = 5.449685245091897 \cdot 10^{-19} \cdot joule$$

or, $Ediff := El - Eh$ or, $Ediff = 1.634905573527569 \cdot 10^{-18} \cdot joule$

$$fdiff := \frac{Ediff}{h} \qquad fdiff = 2.467381444004931 \cdot 10^{15} \cdot Hz$$

The previous page equation results provide a extreme low (real) negative frequency, (perhaps having scalar energy), and an atomic high frequency that is an imaginary negative energy standing wave. The equations suggests that there is a real ELF frequency of action that is entropic, (subtracts energy from its surrounding matter in space), and likely is supported over time from energy space via the electrons' internal connection to that space. The frequency of 10.03224805 Hz, which has been proposed by this author as being the electrogravitational frequency, may be represented as the average mean frequency or perhaps the base ELF of all of the possible electrogravitational atomic scalar frequencies.

The following tables map the energy levels according to increasing atomic outer shell number

$z' := 1 \qquad nl := 1 \qquad nh := 12 \qquad \Delta nh := nl + 1, nl + 2 .. nh$

$$R'_S := \frac{z' \cdot \mu_o \cdot c}{2 \cdot nl} \qquad R''_S(\Delta nh) := \frac{z' \cdot \mu_o \cdot c}{2 \cdot \Delta nh}$$

And: $$\phi l' := \mathrm{atan}\left(\frac{X_L}{R'_S}\right) \qquad \phi l'' := -\mathrm{atan}\left(\frac{X_C}{R'_S}\right)$$

$$\phi h'(\Delta nh) := \mathrm{atan}\left(\frac{X_L}{R''_S(\Delta nh)}\right) \qquad \phi h''(\Delta nh) := -\mathrm{atan}\left(\frac{X_C}{R''_S(\Delta nh)}\right)$$

Then the energy differential between any two levels of the simple Hydrogen atom is given by:

$$\Delta E_{Dn}(\Delta nh) := \frac{\cot(\phi l') \cdot \cot(\phi l'') \cdot X_L \cdot e^{j \cdot \left(\frac{\pi}{2}\right)} \cdot (i_e)^2}{4 \cdot \pi \cdot f_e} - \frac{\cot(\phi h'(\Delta nh)) \cdot \cot(\phi h''(\Delta nh)) \cdot X_L \cdot e^{j \cdot \left(\frac{\pi}{2}\right)} \cdot (i_e)^2}{4 \cdot \pi \cdot f_e}$$

Where, $$\Delta fR_{Dn}(\Delta nh) := \mathrm{Re}\left(\frac{\Delta E_{Dn}(\Delta nh)}{h}\right) \quad \text{and,} \quad \Delta fI_{Dn}(\Delta nh) := \mathrm{Im}\left(\frac{\Delta E_{Dn}(\Delta nh)}{h}\right)$$

Δnh	Real Value frequency $\Delta fR_{Dn}(\Delta nh)$	Imaginary value frequency $\Delta fI_{Dn}(\Delta nh)$	Imaginary Energy $\mathrm{Im}(\Delta E_{Dn}(\Delta nh))$
2	$-0.151078549536782 \cdot sec^{-1}$	$-2.467381441639894 \cdot 10^{15} \cdot sec^{-1}$	$-1.634905571960478 \cdot 10^{-18} \cdot kg \cdot m^2 \cdot sec^{-2}$
3	$-0.179056058710257 \cdot sec^{-1}$	$-2.924303930832426 \cdot 10^{15} \cdot sec^{-1}$	$-1.937665863064243 \cdot 10^{-18} \cdot kg \cdot m^2 \cdot sec^{-2}$
4	$-0.188848186920978 \cdot sec^{-1}$	$-3.084226802049878 \cdot 10^{15} \cdot sec^{-1}$	$-2.043631964950604 \cdot 10^{-18} \cdot kg \cdot m^2 \cdot sec^{-2}$
5	$-0.193380543407083 \cdot sec^{-1}$	$-3.158248245299109 \cdot 10^{15} \cdot sec^{-1}$	$-2.092679132109441 \cdot 10^{-18} \cdot kg \cdot m^2 \cdot sec^{-2}$
6	$-0.195842564214345 \cdot sec^{-1}$	$-3.198457424347981 \cdot 10^{15} \cdot sec^{-1}$	$-2.119322037726526 \cdot 10^{-18} \cdot kg \cdot m^2 \cdot sec^{-2}$
7	$-0.197327085109264 \cdot sec^{-1}$	$-3.222702291121464 \cdot 10^{15} \cdot sec^{-1}$	$-2.13538686949938 \cdot 10^{-18} \cdot kg \cdot m^2 \cdot sec^{-2}$
8	$-0.198290596267027 \cdot sec^{-1}$	$-3.238438142152382 \cdot 10^{15} \cdot sec^{-1}$	$-2.145813563198141 \cdot 10^{-18} \cdot kg \cdot m^2 \cdot sec^{-2}$
9	$-0.198951176344732 \cdot sec^{-1}$	$-3.249226589813845 \cdot 10^{15} \cdot sec^{-1}$	$-2.152962070071406 \cdot 10^{-18} \cdot kg \cdot m^2 \cdot sec^{-2}$
10	$-0.199423685388551 \cdot sec^{-1}$	$-3.256943502964648 \cdot 10^{15} \cdot sec^{-1}$	$-2.158075354987823 \cdot 10^{-18} \cdot kg \cdot m^2 \cdot sec^{-2}$
11	$-0.199773288643677 \cdot sec^{-1}$	$-3.262653145970094 \cdot 10^{15} \cdot sec^{-1}$	$-2.161858607551036 \cdot 10^{-18} \cdot kg \cdot m^2 \cdot sec^{-2}$
12	$-0.200039190590367 \cdot sec^{-1}$	$-3.266995797726876 \cdot 10^{15} \cdot sec^{-1}$	$-2.1647360813921 \cdot 10^{-18} \cdot kg \cdot m^2 \cdot sec^{-2}$

Below is a table of the above values converted into meters, Angstroms, and electron volts, respectively.

z' = 1 nl = 1

Δnh	Real(m) $\left(\frac{c}{\Delta fR_{Dn}(\Delta nh)}\right)$	Imaginary(A) $\left(\frac{c}{\Delta fI_{Dn}(\Delta nh)}\cdot\frac{1}{1\cdot10^{-10}\cdot m}\right)$	Imaginary electron volts $\left(\frac{Im\left(\Delta E_{Dn}(\Delta nh)\right)}{q_o}\right)$
2	$-1.984348267303245\cdot10^{9}\cdot m$	$-1.21502274816799\cdot10^{3}$	$-10.20427353044921\cdot kg\cdot m^{2}\cdot sec^{-2}\cdot coul^{-1}$
3	$-1.674293850537137\cdot10^{9}\cdot m$	$-1.025175443766756\cdot10^{3}$	$-12.09395381386555\cdot kg\cdot m^{2}\cdot sec^{-2}\cdot coul^{-1}$
4	$-1.587478613842591\cdot10^{9}\cdot m$	-972.0181985343885	$-12.75534191306155\cdot kg\cdot m^{2}\cdot sec^{-2}\cdot coul^{-1}$
5	$-1.550272083830639\cdot10^{9}\cdot m$	-949.2365220062286	$-13.06147011897516\cdot kg\cdot m^{2}\cdot sec^{-2}\cdot coul^{-1}$
6	$-1.530782949062518\cdot10^{9}\cdot m$	-937.3032628724578	$-13.22776198391551\cdot kg\cdot m^{2}\cdot sec^{-2}\cdot coul^{-1}$
7	$-1.519266642154061\cdot10^{9}\cdot m$	-930.2517915661258	$-13.32803073364782\cdot kg\cdot m^{2}\cdot sec^{-2}\cdot coul^{-1}$
8	$-1.511884394135796\cdot10^{9}\cdot m$	-925.7316176517956	$-13.39310900871467\cdot kg\cdot m^{2}\cdot sec^{-2}\cdot coul^{-1}$
9	$-1.506864465483406\cdot10^{9}\cdot m$	-922.6578993900693	$-13.43772645985077\cdot kg\cdot m^{2}\cdot sec^{-2}\cdot coul^{-1}$
10	$-1.503294141896404\cdot10^{9}\cdot m$	-920.4717789151471	$-13.4696410601929\cdot kg\cdot m^{2}\cdot sec^{-2}\cdot coul^{-1}$
11	$-1.500663377148086\cdot10^{9}\cdot m$	-918.8609533020461	$-13.49325425513939\cdot kg\cdot m^{2}\cdot sec^{-2}\cdot coul^{-1}$
12	$-1.498668621459803\cdot10^{9}\cdot m$	-917.6395580569491	$-13.51121402642803\cdot kg\cdot m^{2}\cdot sec^{-2}\cdot coul^{-1}$

For the case of Hydrogen, the Angstrom units are very close to the actual energy-level diagram on page 744 of the book, Modern University Physics.[1] These are the Lyman, Balmer, Paschen, Brackett, and Pfund, respectively in the order of lower to the higher shells. (Increasing n levels.) The very slight differences may point to something important not yet discovered.

What is intriguing in the above analysis of the atomic orbitals is that the free space impedance is modified via changing the phase angles related to ϕ' and ϕ'' to create the electron jump. Further, there is an extreme (-) low frequency component in all of the possible orbital energy difference results. This negative energy related frequency is similar to a balloon that has a small pinhole leak and the energy pump from energy space is constantly working to eliminate the loss of negative energy. The mechanics of this quantum energy leak fit naturally into the large scale mechanics of the universe where the law of entropy demands that order moves towards disorder, heat moves towards cooling, etc. Finally, these ELF real frequencies are so low that for most cases, they would be measured only as a very, very low level noise and individual frequencies would likely not be measurable against the level of background noise.

However, the generation of a strong ELF of sufficient power level at just the right frequency could affect the atomic ELF and cause a corresponding change in its associated imaginary quantum high frequency. This could both be used to "melt" the atomic shell structure of an atom, or to change its basic structure to some other type of atom if it were to be applied to the structure of the nucleus, which may be similarly constructed as the atomic realm. If the ELF were to be applied to the large structure macro electron craft, as previously mentioned above, the craft would jump from one point in space to another, just as an electron jumps from one shell to another in the atomic realm.

Recent calculations by Dr. Fran DeAquino[2] of Maranhao State University, Brazil, strongly suggests that gravitational mass may be reduced if the mass is bombarded by coherent ELF photons of sufficient power level. (Below 1000 Hz.). I find this very interesting since the above equations of the atom provide for a ELF frequency that is unique to every possible atomic energy state. We thus have a very interesting theoretical resonance in the two different approaches. I hope for very positive outcome regarding a new breakthrough in atomic electrogravitation that may be extended to the very large scale as a result of these results being similar.

The concept of how a craft nay be designed is presented below. The basic idea is to use the quarter-wave standing wave on a transmission line to generate the simulated structure of an electron at a large scale suitable for human conveyance.

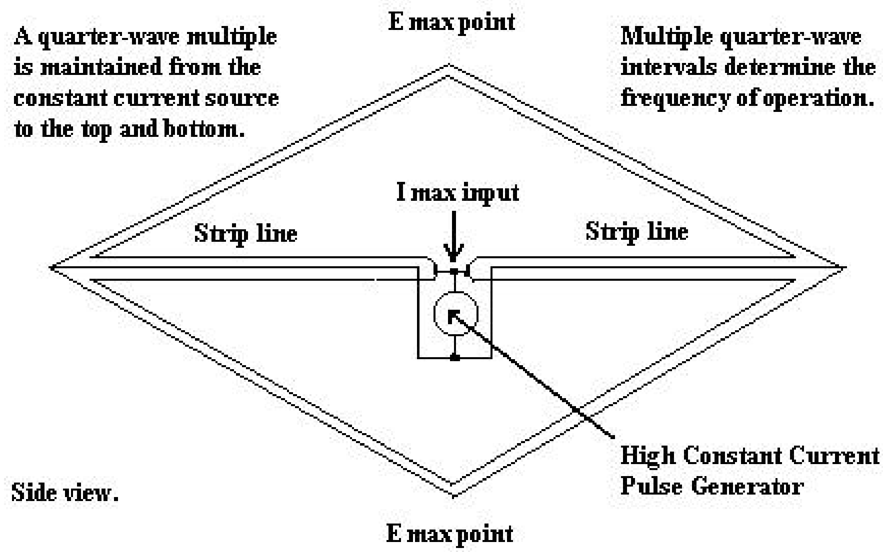


Figure 1.

The voltage at the top and bottom of the craft will be maximum due to the fact that the top and bottom of the craft is exactly 1/4 wavelength multiple, (i.e., 1/4, 3/4, 1 1/4, etc. wavelength), from the high-current (constant-current) impulse generator located at the center of the drawing above. The impulse generator sees a short circuit, thus the current must be limited to protect the generator. The voltage at the top and bottom of the craft are in phase, therefore the craft is not able to radiate an ordinary electromagnetic wave, only a scalar standing wave will exist around the craft. Theoretically, an extremely high voltage will appear at the top and bottom of the craft. This will be sufficient to ionize the surrounding air if the craft is in our atmosphere for instance. This phenomena however, is not incidental to how the craft operates as ionized medium around the craft is not needed. The craft will likely operate best in the vacuum of outer space.

Early on, I determined that the strip-line fed outer/inner transmission line "skin" construction would be most suitable for a couple of reasons. First, the build is extremely light and simple, leaving the most room available for transport of people and related equipment. Secondly, there is no voltage differential across the top and bottom, so no real power is expended by radiation of electromagnetic type waves. Thirdly, the field set up around the craft would represent closely the standing wave fields associated with atomic structure. Thus, by manipulating a portion of the standing wave at some point on the perimeter of the craft, the craft would act like a macro electron and jump to some point in the standing wave field that surrounds the craft. If it works in atoms, it likely would work for a macro-quantum electron/vehicle. The dielectric insulation between the strip transmission lines would have to be very good, especially at the top and bottom of the craft due to the extreme high voltages at those points.

There would most likely be a very low level ELF real (-) energy radiated from even the most efficient design. This fact was presented in the atomic shell analysis above. It is also likely that if real UFO's operate on phase-shifted standing wave principles, there would be associated with there presence a strong ELF wave. Also, as in the atomic realm, there would be energy being sucked into the craft from surrounding space, making things a bit cooler in the vicinity of the craft. It would also cause cars to stall, lights to dim, etc.

I feel that the design in figure 1 above is easy enough to build by technically adept persons. It is my hope that if it is built and works as theorized, no attempt will be made to suppress or capitalize at others expense on the design or the benefits. It should be made available to anyone and everyone who wants one and also be buildable by anyone and everyone who wants to, without negative inputs or repercussions. --END--

References

1) Richards J. A. R. Jr., Sears F. W., Wher M. R., Zemansky M. W., Modern University Physics, Addison-Wesley Publishing Co., March 1964.

2) DeAquino F., URL web site: http://xxx.lanl.gov/abs/gr-qc/9910036.

The reader is also invited to visit my web site: http://www.electrogravity.com where my book, "Electrogravitation As A Unified Field Theory," may be downloaded along with many related files and graphics. It is in Adobe Acrobat 3.0 format and can be read with the Adobe Acrobat free reader.