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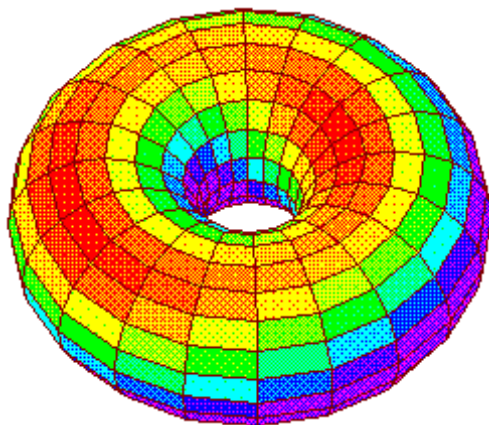
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**ELECTROGRAVITATION AS
A UNIFIED FIELD THEORY**

by

JERRY E. BAYLES



Included with this paper is a table of related constants which are pertinent to the formulas that will be presented. Most of the constants will be recognized immediately while some are developed within the text itself. All units are in the MKS system.

Table of Physical Constants:

-
1. Gravitational Constant, $G := 6.672590000 \cdot 10^{-11} \cdot \frac{\text{m}^3}{\text{kg} \cdot \text{sec}^2}$
 2. Speed of light, $c := 2.997924580000000 \cdot 10^8 \cdot \text{m} \cdot \text{sec}^{-1}$
 3. Magnetic permeability, $\mu_0, \mu_o := 1.256637061000001 \cdot 10^{-6} \cdot \frac{\text{newton}}{\text{amp}^2}$
 4. Electric permittivity, $\epsilon_0, \epsilon_o := 8.854187817000001 \cdot 10^{-12} \cdot \frac{\text{farad}}{\text{m}}$
 5. Bohr n1 Velocity, $V_{n1}, V_{n1} := 2.187691415844453 \cdot 10^6 \cdot \frac{\text{m}}{\text{sec}}$
 6. Electron charge, $q_0, q_o := 1.602177330000001 \cdot 10^{-19} \cdot \text{coul}$
 7. Electron mass, $m_e, m_e := 9.109389700000001 \cdot 10^{-31} \cdot \text{kg}$
 8. Compton Electron radius, $r_c, r_c := 3.861593228000001 \cdot 10^{-13} \cdot \text{m}$
 9. Bohr Radius, $r_{n1}, r_{n1} := 5.291772490000000 \cdot 10^{-11} \cdot \text{m}$
 10. Fine structure constant, $a, \alpha := 7.297353080000001 \cdot 10^{-03}$
 11. Plank constant, $h, h := 6.6260755 \cdot 10^{-34} \cdot \text{joule} \cdot \text{sec}$
 12. Compton Electron time, $t_c, t_c := 8.0933010000001 \cdot 10^{-21} \cdot \text{sec}$
 13. Quantum electromagnetic frequency, $f_{Lm}, f_{LM} := 1.00322480500001 \cdot 10^1 \cdot \text{Hz}$
 14. Quantum electric field frequency, $f_h, f_h := 9.016534884 \cdot 10^{17} \cdot \text{Hz}$
 15. Quantum acceleration field constant, $A_{em}, A_{em} := 3.007592302 \cdot 10^{09} \cdot \frac{\text{m}}{\text{sec}^2}$
 16. Field acceleration frequency constant, $f_a, f_a := 3.520758889 \cdot 10^{10} \cdot \text{Hz}$

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17. Free space resistance, R_s , $R_s := \mu_0 \cdot c$ and $1 \cdot \Omega = 1 \cdot \text{kg} \cdot \text{m}^2 \cdot \text{sec}^{-1} \cdot \text{coul}^{-2}$

$$R_s = 376.7303133310863 \cdot \text{ohm}$$

and/or... $R_s := \frac{1}{\epsilon_0 \cdot c}$

$$R_s = 376.730313488167 \cdot \text{ohm}$$

18. Quantum Hall Ohm, R_Q , $R_Q := \frac{h}{q_0^2}$

$$R_Q = 2.58128058743606 \cdot 10^4 \cdot \text{ohm}$$

Additional related constants are included for the discussions past page 21 below.

	(SUN MASS)		(SUN rad.)
$m_r := 1.99 \cdot 10^{30} \cdot \text{kg}$	= 1.99 x 10³⁰ kg	$r_s := 6.96 \cdot 10^8 \cdot \text{m}$	= 6.96 x 10⁸ m

$$\pi := 3.141592654000001$$

$$m_p := 1.672623100000001 \cdot 10^{-27} \cdot \text{kg}$$

$$m_e := 9.109389700000001 \cdot 10^{-31} \cdot \text{kg}$$

$$l_q := 2.817940920000001 \cdot 10^{-15} \cdot \text{m}$$

$$m_a := 1.660540200000001 \cdot 10^{-27} \cdot \text{kg}$$

Note.....

((V_{n1} & V_{LM} are SELECT))

$$V_{n1} := 2.187691415844453 \cdot 10^6 \cdot \text{m} \cdot \text{sec}^{-1}$$

$$V_{LM} := -0.085363289893272 \cdot \text{m} \cdot \text{sec}^{-1}$$

NOTE: $\frac{V_{n1}}{V_{LM}^2} = 3.002228710934959 \cdot 10^8 \cdot \text{m}^{-1} \cdot \text{sec}$

$$V_n := \frac{V_{n1}}{\alpha}$$

$$\frac{V_n}{c} = 0.999999999587411$$

$$\lambda_{\Delta} := 2 \cdot \pi \cdot r_{n1}$$

$$m_{\Delta} := m_e$$

$$t_{\Delta} := \frac{h}{m_e \cdot V_{n1}^2}$$

$$r_x := r_{n1}$$

$$t_h := \frac{t_c}{\alpha}$$

$$f_h := \frac{1}{t_h}$$

and constants in general that are also used are:

$$t := 1 \cdot \text{sec}$$

$$Q_i := q_0 \cdot t^{-1}$$

$$L := 1 \cdot \text{m}$$

III

PREFACE

Welcome to ELECTROGRAVITATION AS A UNIFIED FIELD THEORY. The first chapter deals with a non-relativistic approach employing concepts that utilize quantum limits as the fundamental force beginnings and whereby they are related to each other. The second chapter presents the electrical and magnetic forces in the light of the Special Theory of Relativity and how the electrogravitational force may be connected to that concept of space-time very intimately. The third chapter presents the connection of the electrogravitational force to the General Theory of Relativity and how the force itself generates curved space. The remaining chapters explore the finer aspects of my theory as well as its implications.

I have long been of the opinion that curved space is not the cause of what we call gravity but rather the effect of a very basic electrical-magnetic action force that is simply not understood for what it is. Curved space may very well exist and follow all of the rules as predicted by Einstein's General Theory of Relativity due to the amount of standing wave matter fields (we call mass) that affects the space-time geometry in a local region but curved space is again most likely the effect and not the cause of the gravitational field as presented in contemporary physics lectures and articles.

Another misleading aspect of contemporary physics is how the electromagnetic force concerning quantum electrodynamics is presented to the general public today which limits the forces to only four and completely overlooks the magnetic force which is the fundamental connection force necessary to unify all the other forces. By calling the electric and magnetic forces a single force (electromagnetic) the magnetic force is not given the weight that it may have otherwise had in the overall force picture.

It is my objective to illustrate a most likely causal mechanism of the force we call gravity and to not only unify that force to the strong, weak, coulomb (electric), and

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magnetic fields but to show that mass is a standing wave of the magnetic field vectors and that inertia is the result of the need to restore all matter from one instant to the next. What is left over from atomic constructs of matter-energy is the necessary energy to create the electrogravitational field as proposed in this paper.

Einstein pointed out that the three equations of the electric, magnetic, and gravitational forces all had the same general form of a constant times squared terms in the numerator divided by squared distance terms in the denominator. The problem with tying them to a common causal action has led to a very complicated approach which arrives at a description of the effect rather than a succinct description of the cause. The matter becomes even more confused when the effect is then promoted as the cause. Ergo, curved space is taken as the cause rather than the effect of gravity.

While we are on the subject of causal I would like to explain why I became fascinated at a very early age with the gravitational action. Very briefly I saw something in the sky in broad daylight as bright as the sun over a small town on the Columbia river in the state of Oregon named Umatilla. This was about 1952 and I was six or seven years old at the time. The object stayed in the sky all afternoon and had the town in an uproar as to what it was. Two smaller bright objects came out of it soon after it appeared and they flew geometric patterns around the much larger object until late in the afternoon. Then they returned to the larger craft and then the large object began to glow a reddish color on one side and then took off across the sky away from the sunset at a very accelerated pace and was gone in a matter of seconds leaving hardly any trail or vestige of its former existence. Ever since that sighting I have endeavored to determine how that object worked and as time has permitted, have continued working towards that conclusion.

J. E. Bayles

ELECTROGRAVITATION AS A UNIFIED

FIELD THEORY

- By -

Jerry E. Bayles

(Chapter 1)

The purpose of this book will be to present a plausible connection of the gravitational force-field to the electric and magnetic force-fields. It will also show a possible connection between these fields to the strong and weak force-fields.

While the conventional terminology of force-fields present force-fields as *The Four Forces* this book will present five force-fields, as the electromagnetic force will be expanded to include the component electric and magnetic force-fields. Thus the electric, magnetic, strong, weak, and the electrogravitational force-fields will encompass the normal *Four Forces* terminology.

Also, In this book, fields are considered as real entities and although invisible to the naked eye they represent a special case of energy which has a momentum and thus an equivalent rest mass. (With the possible exception of the electrogravitational field.) Fields are then treated as an extension of rest mass that embody time dependent properties that define the nature of the field being considered.

While contemporary work in quantum physics involving field theories tend to lead into complex mathematical realms involving gauge fields, metric tensors, gauge bosons, and so on, it is the purpose of this paper to present the five forces in terms that will involve as little abstract mathematics as possible. This will be done so as to

allow for the widest possible understanding of the field theory presented herein.

Again, the main intent of this paper is to unify the five forces by association of their common structures starting from one of the most commonly observed forces, namely the coulomb force between charges. Further, these forces will be reduced to their smallest level of quantum interaction in order that the quantum nature of charge and magnetism can best be presented. From there we will proceed to the electrogravitational case involving quantum charges in motion. Finally the quantum cases involving charge-field interactions for the strong and weak forces will be presented.

From all of this a possibly fundamental frequency for the electric, magnetic, and electrogravitational interactions will be derived which would be ubiquitous in all force-fields.

Suppose for the moment that the whole of creation consisted of a singular electron and that electron had just been created out of a singularity in as much the same fashion as the universe has been theorized to have been created in the Big Bang theory. Further, let the charge-field begin to expand away from the electron out into space towards infinity. This expansion process would take an infinite amount of time and would result in an infinite amount of energy. It is natural to ponder upon the source of all this field energy considering that the rest mass of the Electron is not infinite but very much smaller indeed than infinity.

A natural solution for this dilemma is to imagine that the electron is created repeatedly and that part of this creation energy is converted into field energy. Thus, over a period of many creations, the field energy is metered out through a series of equally timed field "gates". It is further natural to propose that all matter is thus recreated from one time interval to the next. This would have to include matter not normally exhibiting an external charge-field but in those cases the field is in motion

but is a terminated field. (The field vector is connected to a conjugate vector field.)

This would include neutrons, bosons, and particles exhibiting zero charge in general.

Mass would then be the result of standing wave fields.

The source for all this energy would come from the same place as the energy came from that initiated the Big Bang but due to the geometry of the electron, instead of being allowed one creation pulse of a very great magnitude and a very short duration, as in the Big Bang, it is allowed to have a great many creation pulses of the magnitude required to support its field and mass geometry. Also, since all electrons would exhibit like geometry and field expansion characteristics, then all electrons would be deriving the required energy pulse inputs from the same source.

It may be further theorized that the center of energy input for all Electrons may be at the same point in the dimension of time that in itself has the required built in singularity that unifies all matter throughout time and space. This is akin to a series of frames of a motion picture which are able to imply motion to an observer of the artifacts that are projected upon the screen and these frames must be of the proper time duration and interval in order to create continuity in the overall picture. The energy in this case is supplied by the projector lamp and the apparent motion is created by a displacement of the images in each successive frame, each one arriving at the screen in carefully metered out cadence. The entire picture, (our temporary local universe in this case), stems from one source and one time interval. It is easily seen that an image can be placed anywhere on the screen and then made to suddenly appear somewhere else, apparently instantaneously.

So what is charge that gives rise to field energy, energy without rest mass flowing seemingly forever into a counter-point in space. When it flows out, it flows across space and into a point and does so without losing strength over an infinitely long

period of time. An endless source of field energy absorbed by an oppositely charged bottomless receptor-well. No real power is absorbed at the termination point nor is any lost by the source. What a curious and unique phenomena. The source does not lose any mass energy in the process nor does the receptor gain any. The field rate of growth is equivalent to the velocity of light in free space.

The bottomless connector point may be connected to the source point through hyperspace, which is not our space but an extension thereof. The field has an equivalent momentum since it has energy. The rate of exchange of energy per unit time is power. This power is a constant over time for all field connected charges. The power remains constant whether the charges are proton to electron or positron to electron, etc. It has no rest mass. It has a rotational vector equivalent to momentum that is directly related to the energy transferred. The equation below will hopefully serve to illustrate this concept, where q_0 is the charge on the electron, h is Planks constant, ϵ_0 is the permittivity of free space and V_{n1t} is the rotational vector velocity.

$$(1) \quad V_{n1t} := \frac{q_0^2}{2 \cdot h \cdot \epsilon_0} \quad \text{or,} \quad V_{n1t} = 2.187691396926174 \cdot 10^6 \cdot \text{m} \cdot \text{sec}^{-1}$$

If the equivalent mass of the field goes up the radius related to a matter-field wavelength goes down so that V_{n1} remains a constant. This is by reason of Heisenbergs expression for h related to matterwaves and momentum wherein we consider a change in *relative field mass* while holding velocity a constant.

$$(2) \quad h_t := m_{\Delta} \cdot (V_{n1}) \cdot \lambda_{\Delta} \quad \text{or,} \quad h_t = 6.626075452110047 \cdot 10^{-34} \cdot \text{sec joule}$$

Therefore all charge fields move outwards from the source at $V = C$ and have a rotational vector component equal to V_{n1} . V_{n1} is 1/137 that of C , (1/137 is the fine structure constant), and powers of this constant appear throughout the Theory Of Quantum Electrodynamics. The quantum expression for power is Planks constant

and is related to the quantum ohm as shown in the below expression in (3) involving the charge of the electron squared divided into Planks constant.

$$(3) \quad R_{Qt} := \frac{h}{q_o^2} \quad R_{Qt} = 2.58128058743606 \cdot 10^4 \cdot \text{ohm}$$

$$(4) \quad \text{Power} = \text{Current}^2 \times \text{Impedance}$$

The expression in (4) is the classical expression for power in an electrical circuit. The two are equivalent to each other but h in (3) is equal to (energy x time) while classical power in (4) is equal to (energy / time). This is but one difference between the classical and the quantum in the realm of physics. Ergo, when energy is increased in the classical sense power increases but in the quantum sense power remains the same. This is true for momentum as well (including (2) above) as the two famous Heisenberg expressions below illustrate.

$$(5) \quad h_{t1} := m_{\Delta} \cdot V_{n1} \cdot \lambda_{\Delta} \quad (6) \quad h_{t2} := m_{\Delta} \cdot V_{n1}^2 \cdot t_{\Delta}$$

Again, the idea of the Electron being successively recreated makes it a distant grandson of the GREAT GREAT Granddaddy Big Bang which gave birth to the whole process of particle creation but instead of only happening once, the electron measures out its field energy in evenly spaced portions over evenly spaced pulse intervals over a potentially infinite time. It has been theorized that the Four forces were unified into the same force during the creation event but that they became separated while matter was expanding and cooling. The order of magnitude and time to separation would be the strong force, the electroweak force, the electromagnetic force, and then the gravitational force. When further examining the electromagnetic force, the two forces contained therein, namely the electric and the magnetic forces are also separated in magnitude and the electric force can be theorized to have been created before the magnetic force was as it will be shown

that the electric force is stronger than the magnetic force by a multiple equal to C^2 . It therefore is possible to prove that there is a connection particle for the electromagnetic force to the weak force called the Z^0 particle at 92 gigavolts of energy as well as a supposed X particle at even higher energies that will unite the strong force to the weak force. Thus the gravitational connection particle will not likely be discovered in the higher energy realm but in the very weakest as it will have the lowest quantum energy. It will be developed later what the mechanics of that connection may be.

Based on the above conceptual view of the electron and its associated energy field being constantly recreated, it can be postulated that there is no such thing as a static field, electrical or otherwise.

Secondly, it can be postulated that all charge-point sources are in exact synchronization with all other charge-point sources through a master clock in hyperspace where all charge-point sources become one point.

Since no real power is gained or lost in the uniform electric field source-to-receptor energy transfer, then for the sake of convention herein the electron can be defined as purely inductive and its counterpoint charge-receptor as purely capacitive so that the net resonant or reactive result consumes no real power.

It can be shown mathematically that the energy density at the surface of the electron is very large indeed compared to its rest mass. The concept of metered out energy which is properly scaled down by time and allowed area not only places this energy density at a real quantum value but gives a hint as to the geometrical construction of the electron mass-field itself.

If the rest-mass energy of the electron is divided by the field energy at the compton radius of the electron the quotient is the number 137.0359895 which is the inverse of the fine structure constant encountered throughout modern quantum

electrodynamic theory. (7) below is the equation for the potential field energy at the compton radius of the electron.

$$(7) \quad E_{\text{Epot}} := \frac{q_0^2}{4 \cdot \pi \cdot \epsilon_0 \cdot r_c} \quad (8) \quad r_{\text{ct}} := \frac{h}{2 \cdot \pi \cdot m_e \cdot c}$$

For those not familiar with the term compton radius, it is derived from the deBroglie expression for matterwaves and is shown in (8). This is the shortest possible wavelength related directly to the rest-mass of a particle taking the velocity to the theoretical maximum, or C, the velocity of light in free space. This is Planks constant divided by 2 times Pi times the momentum portion, mass times velocity C.

Now that the quantum potential field energy of the electron has been presented the total energy density of the field can be arrived at by dividing the potential field energy by the volume for the same compton radius. This expression for the total field related energy density is shown in (9).

$$(9) \quad E_{\text{density}} := \frac{q_0^2}{32 \cdot \pi^2 \cdot \epsilon_0 \cdot r_c^4} = \frac{\frac{q_0^2}{4 \cdot \pi \cdot \epsilon_0 \cdot r_c}}{8 \cdot \pi \cdot r_c^3}$$

The term on the left is arrived at directly from classical field theory, as in (11) below.

The expression for the E field potential in volts / meter is shown below in (10) also.

$$(10) \quad E := \frac{q_0}{4 \cdot \pi \cdot \epsilon_0 \cdot r_c^2} \quad (11) \quad E_{\text{density1}} := \frac{\epsilon_0 \cdot E^2}{2}$$

From all of this the volume is determined to be a special shape, that of a cylinder eight times as long as the radius! This infers a preferred shape for the volume of an electric field in general. One may well ask if that specially inferred shape may extend to any volume of space. In general, it logically should.

The energy density arrived at in equation (9) above is very large. It has been

argued that this is an inordinate amount of energy compared to the rest-mass energy of the electron and rightly so. It can be shown however that this large amount of energy does not exist at the quantum compton radius of the electron.

As was previously proposed where the term *time-gate* was used to describe the metering out of energy from the electron into its surrounding field, that concept applies to the energy density surrounding the electron at the compton radius where the quantum distance for the field can grow no smaller.

Since Planks constant h can be related to power which is equal to the electron charge squared times the quantum ohm, (which again is the same as the expression for electrical power), then h may be related to Poyntings` vector, ($S_{avg.}$) by the below expression in (12).

$$(12) S_{max} = E_{field\ density} \times c \quad (13) E_{field\ density} = E_{pot} / \text{field vol.}$$

If the value for ($S_{max.}$) is calculated based on the volume of the cylinder and then that value is scaled down by multiplying by the compton area and by the compton time a value approximately equal to the correct potential field energy is arrived at. If however a volume equal to a compton **torus** is assumed wherein the cylinder is bent around to form a torus, then the exact potential field energy is arrived at as required by the equation in (7).

In equation (13) above the general relationship involving the energy density of the electric field is shown whereas in (14) below the ($S_{max.}$) power of the compton torus is shown.

$$(14) S_{max} := \frac{q_o^2 \cdot c}{8 \cdot \pi^3 \cdot \epsilon_o \cdot r_c^4} \quad \text{or,} \quad S_{max} = 1.575750434657439 \cdot 10^{29} \cdot m^{-2} \cdot \text{watt}$$

Then in equation (15) the scaling factors of the compton area and the compton time of the electron are applied to arrive at the potential field energy of the electron which is 1 / 137.0359895 that of the electron rest-mass.

$$(15) \quad E_{nt} := S_{\max} \cdot \pi \cdot r_c^2 \cdot t_c \quad \text{or,} \quad E_{nt} = 5.97442411695454 \cdot 10^{-16} \cdot \text{joule}$$

Thus the quantum volume associated with the electric field related to energy density and potential field energy is very likely a **torus** while at a macroscopic scale the volume assumes the shape of a cylinder. The torus shape at a quantum level is quite interesting as it becomes possible to imagine such things as a closed system with such characteristics as standing wave energy or resonance involving matter and charge that would appear to a casual observer to be a *static* field.

One can imagine a torus that has both radius vectors equal to the compton radius of the electron and that has one of the radius vectors pointing out to the central circumference and a second radius vector rotating through an area perpendicular to the plane of rotation of the first radius vector. The combined action would take a net shape of a spring wrapped around to meet itself and the endpoints of the moving vectors would form a three dimensional moving torus in quantum space. The compton time would be the base time for this system and would be the fourth dimensional aspect of the torus described.

After some investigation and evaluation of the torus shape equation (16) below was discovered to present the area of the electron's compton torus and then relate that to Plank's constant h and the rest mass of the electron.

$$(16) \quad m_{et} := \left(\frac{q_o^2}{2 \cdot V_{n1} \cdot \epsilon_o} \right) \cdot \left(\frac{t_c}{4 \cdot \pi^2 \cdot r_c^2} \right) \quad \text{or,} \quad m_{et} = 9.109389745137863 \cdot 10^{-31} \cdot \text{kg}$$

The equations in (17 a & b) below are presented to help clarify the concept of torus area and volume discussed above. Also, in (16) above the term (charge squared) / ((2V_{n1}) x epsilon) is equal to Planks constant h, where V_{n1} is also equal to the velocity of the electron in the lowest orbital (n1 ground state) of the element Hydrogen.

$$(17.a) \text{ Torus Area} := 4 \cdot \pi^2 \cdot r_c^2 \quad (17.b) \text{ Torus Volume} := 2 \cdot \pi^2 \cdot r_c^3$$

Equation (18) below also shows a relationship between charge and Planks constant h and is where the term discussed in (16) came from.

$$(18) \quad q_{ot} := \sqrt{2 \cdot h \cdot V_{n1} \cdot \epsilon_0} \quad \text{or,} \quad q_{ot} = 1.602177336927495 \cdot 10^{-19} \cdot \text{coul}$$

Equation (18) is a very significant relationship as it relates charge to h directly in the quantum sense. By relating the charge of the Electron to h as in (18), charge is then related to momentum, wavelength, energy, and time through Heisenbergs formulas where (momentum x wavelength = h) and (energy x time also = h).

Equat. (18) also establishes V_{n1} as fundamental to the quantum electric charge of the Electron and it is suggested here that V_{n1} is a rotational vector end-point velocity equal to the fine structure constant times the velocity of light in free space. (Rotational vector end-point velocity is suggestive of an electric field action analogous to spin.)

The next force to consider is the magnetic force which exists any time there is a charge-particle in motion and for the main part of the following topic on the magnetic force action the rotational motion of the magnetic vector is the main theme.

The magnetic force in an electromagnetic wave is a vector force 90 degrees to an in-phase electric field in motion and it is 90 degrees away from both the electric field and the direction of the resultant particle/wave direction of motion.

When equal and distinct quantum charges separated by the same distance are considered however, the magnitude of the electric force is greater than the magnitude of the magnetic force by a factor of the speed of light squared. An equivalent formula for the force between two parallel wires is shown in (19) below where μ_0 is the magnetic permeability of free space and r_{n1} is the Bohr radius of the Hydrogen atom.

$$(19) \quad F_{Mt} := \frac{\mu_0 \cdot Q_i^2}{2 \cdot \pi \cdot r_{n1}} \cdot L \quad \text{or,} \quad F_{Mt} = 9.701748139743987 \cdot 10^{-35} \cdot \text{newton}$$

In equation (20) below the two wires are closed into parallel loops and then the corresponding geometrical correction is applied to arrive at the fundamental statement for magnetic force between parallel orbital charges. This discussion leads directly to the magnetic forces between charge-particles in circular motion on a quantum scale and the quantum scale is where the fundamental action forces play the basic role in quantum electrodynamics.

$$(20) \quad F_{MT} := \frac{V_{LM}^2 \mu_0 \cdot q_o^2}{L \cdot 2 \cdot l_q \cdot 2 \cdot \pi \cdot r_{n1}} \cdot L \quad \text{or,} \quad F_{MT} = 1.254383710426251 \cdot 10^{-22} \cdot \text{newton}$$

In equation (21) below the interrelationship between electric field mass-energy and magnetic-mass field energy is shown. This places the magnetic quantum field energy at a force level proportional to $1 / C^2$ that of the quantum electric field force at the same radius of action.

$$(21) \quad M_{Efield} := \frac{q_o^2 \cdot V_{LM}^2}{4 \cdot \pi \cdot \epsilon_o \cdot c^2 \cdot l_q} \quad \text{equals} \quad E_{Mfield} := \frac{\mu_o \cdot q_o^2 \cdot V_{LM}^2}{4 \cdot \pi \cdot l_q}$$

The next equation will assign a quantum frequency to this magnetic energy by use of the quantum expression ($E = h f$) which is a form of the Heisenberg equation

previously presented as $(E \cdot t = h)$. This equation is shown in (22) below and is the fundamental electrogravitational and magnetic action related quantum frequency as will be presented later on.

$$(22) \quad F_{Lmt1} := \frac{M_{Efield}}{h} \quad \text{and} \quad F_{Lmt1} = 10.01786534654713 \cdot \text{Hz}$$

The following is the result of much study of the different aspects of quantum magnetic energy as it relates to mass and the topic will be explained and developed further in the remainder of this paper. In equation (23) the electrogravitational expression involving two charge-field systems of interaction states the case for gravitation through the aspect of quantum electric and magnetic separate system forces creating another force, gravity.

$$(23) \quad F_{Gt} := \frac{\mu_o}{c^2} \cdot \left(\frac{\mu_o \cdot q_o^2 \cdot V_{LM^2}}{4 \cdot \pi \cdot r_x \cdot l_q} \right) \cdot \left(\frac{q_o^2 \cdot V_{LM^2}}{4 \cdot \pi \cdot \epsilon_o \cdot r_x \cdot l_q} \right)$$

or,

$$F_{Gt} = 1.977291389792974 \cdot 10^{-50} \cdot \text{m}^{-1} \cdot \text{henry} \cdot \text{newton}^2$$

Please refer to the APPENDIX #8 for comments on the units in eq. #(23).

The term $(\mu_o) / (C^2)$ can be likened to the gravitational constant and thereby designated as G' . The gravitational constant G is utilized in the normal expression for gravitational force and that equation is presented in equation (24). Notice that the general form of this force expression follows the electric and magnetic force expression forms very closely in the similar arrangement of terms. It will be developed later that the classical gravitational expression can be related to the magnetic force expression very closely.

$$(24) \quad F_G := \frac{G \cdot (m_e \cdot m_e)}{r_x^2} \quad \text{where,} \quad F_G = 1.97729138896852 \cdot 10^{-50} \cdot \text{newton}$$

The constant term that was expressed in equation (23) that was expressed as G' can be related directly to G in equation (25) wherein the fine structure constant and the V_{n1} constant are shown as related to G also. It is apparent that the macroscopic form of G then has a hidden aspect of the magnetic forces and also that this hidden aspect opens the door to a different perspective concerning the possible case for electrogravitation. In fact these new aspects can be expressed in the various forms that follow which may help to lend weight to the argument for the magnetic-electric case for the electrogravitational force-action.

$$(25) \quad G'_1 := \frac{G}{c^2 \cdot \alpha^2} = G'_2 := \frac{G}{V_{n1}^2} = G'_3 := \frac{\mu_0}{c^2}$$

Before moving on to present these various cases for electrogravitation a general form of G as it relates to the magnetic constant (μ_0) is presented in (26). This new form of G embodies the terms that appear frequently in electric and magnetic field theory. Magnitude is the feature of most interest in the below expression.

$$(26) \quad G_t := \mu_0 \cdot \alpha^2 \quad G_t = 6.691763500548768 \cdot 10^{-11} \cdot \text{kg} \cdot \text{m} \cdot \text{coul}^{-2}$$

The following equations are placed in groups of four cases each for the electric force, the magnetic force, the electrogravitational force, the weak force, and the strong force respectively. The weak force and the strong force equations follow naturally from the electrogravitational force equations wherein the main difference is that both the weak and the strong force equations embody the products of the electric and magnetic forces and an appropriate connecting constant in the overall product expressions.

It will be readily seen that a marked similarity between the equations in general is immediately apparent and that an even more fundamental relationship between the

five forces may be at work which is not so readily apparent. The one thing that may be at work is that time is a real dimension in all of our perceived three-dimensional space. That is, height, length, and depth are all distance related and distance is the result of the product of velocity and time. This implies that time may well be the foundation of n-dimensional space wherein intervals related to time translate in our three-dimensional senses into distance and related velocities.

ELECTRIC FORCE QUADSET of EQUATIONS:

$$\begin{aligned}
 \text{(I)} \quad F_{Et1} &:= \frac{q_o^2}{4 \cdot \pi \cdot \epsilon_o \cdot r_x^2} \\
 \text{(27)} \quad F_{Et1} &= 8.238729464946122 \cdot 10^{-8} \cdot \text{newton} \\
 \\
 \text{(II)} \quad F_{Et2} &:= \frac{q_o^2 \cdot (t_h) \cdot (f_h)}{4 \cdot \pi \cdot \epsilon_o \cdot r_x^2} \quad [\text{Where } (t_h) \times (f_h) = 1]. \\
 \text{(28)} \quad F_{Et2} &= 8.238729464946122 \cdot 10^{-8} \cdot \text{newton} \\
 \\
 \text{(III)} \quad F_{Et3} &:= \frac{h \cdot (V_{n1})}{2 \cdot \pi \cdot r_x^2} \\
 \text{(29)} \quad F_{Et3} &= 8.238729536191356 \cdot 10^{-8} \cdot \text{newton} \\
 \\
 \text{(IV)} \quad F_{Et4} &:= \frac{h \cdot (f_h) \cdot r_c}{r_x \cdot r_x} \\
 \text{(30)} \quad F_{Et4} &= 8.238729483360807 \cdot 10^{-8} \cdot \text{newton}
 \end{aligned}$$

The constant term f_h that appears in equations (28 & 30) above is the electric field quantum base frequency derived from the maximum field energy at the surface of the electron. Then also t_h is the inverse of that frequency which of course is time. Equation (31) next expresses the equation for this basic quantum frequency.

$$(31) \quad f_{hE1} := \frac{q_o^2}{4 \cdot \pi \cdot \epsilon_o \cdot r_c \cdot h}$$

where,

$$f_{hE1} = 9.016534864685412 \cdot 10^{17} \cdot \text{Hz}$$

MAGNETIC FORCE QUADSET of EQUATIONS:

$$(I) \quad F_{Mt1} := \frac{\mu_o \cdot q_o^2 \cdot V_{LM}^2}{4 \cdot \pi \cdot l_q \cdot r_x}$$

(32)

$$F_{Mt1} = 1.254383710426251 \cdot 10^{-22} \cdot \text{newton}$$

$$(II) \quad F_{Mt2} := \frac{q_o^2 \cdot (t_c) \cdot (f_{LM})}{4 \cdot \pi \cdot \epsilon_o \cdot l_q \cdot r_x}$$

(33)

$$F_{Mt2} = 1.256184635226011 \cdot 10^{-22} \cdot \text{newton}$$

$$(III) \quad F_{Mt3} := \frac{h \cdot (V_{n1}) \cdot V_{LM}^2}{2 \cdot \pi \cdot c^2 \cdot l_q \cdot r_x}$$

(34)

$$F_{Mt3} = 1.254383721796684 \cdot 10^{-22} \cdot \text{newton}$$

$$(IV) \quad F_{Mt4} := \frac{h \cdot f_{LM} \cdot l_q}{l_q \cdot r_x}$$

(35)

$$F_{Mt4} = 1.256184636426583 \cdot 10^{-22} \cdot \text{newton}$$

The constant term f_{LM} in equation (33) and (35) is the result of the equation (22) on page 12 and represents the quantum frequency associated with magnetic fields in general. This frequency is associated to the Compton frequency and radius of the electron in equation (36) on the next page.

$$\text{Let: } f_c := \frac{1}{t_c} \quad \text{then,} \quad (36) \quad f_{LMt} := \frac{V_{LM}^2}{(2 \cdot \pi \cdot r_{n1}) \cdot (2 \cdot \pi \cdot l_q) \cdot f_c}$$

$$f_{LMt} = 10.01786550605671 \cdot \text{Hz}$$

and where, $F_{Lmt1} = 10.01786534654713 \cdot \text{Hz}$

Equation (36) is a very basic quantum expression for showing how the case involving the n1 orbital of Hydrogen is directly involved with the magnetic quantum frequency and the classic radius of the electron.

The next set of four equations present the electrogravitational force quadset.

ELECTROGRAVITATIONAL FORCE QUADSET of EQUATIONS:

$$(I) \quad F_{Gt1} := \frac{\mu_o \cdot q_o^2 \cdot V_{LM}^2}{4 \cdot \pi \cdot (l_q) \cdot r_x} \cdot \mu_o \cdot \frac{\mu_o \cdot q_o^2 \cdot V_{LM}^2}{4 \cdot \pi \cdot (l_q) \cdot r_x}$$

(37)

$$F_{Gt1} = 1.977291388968526 \cdot 10^{-50} \cdot \text{m}^{-1} \cdot \text{henry} \cdot \text{newton}^2$$

$$(II) \quad F_{Gt2} := \frac{q_o^2 \cdot (t_c) \cdot (f_{LM})}{4 \cdot \pi \cdot \epsilon_o \cdot (l_q) \cdot r_x} \cdot \mu_o \cdot \frac{q_o^2 \cdot (t_c) \cdot (f_{LM})}{4 \cdot \pi \cdot \epsilon_o \cdot (l_q) \cdot r_x}$$

(38)

$$F_{Gt2} = 1.982973078403706 \cdot 10^{-50} \cdot \text{m}^{-1} \cdot \text{henry} \cdot \text{newton}^2$$

$$(III) \quad F_{Gt3} := \frac{h \cdot (V_{n1}) \cdot V_{LM}^2}{2 \cdot \pi \cdot c^2 \cdot (l_q) \cdot r_x} \cdot \mu_o \cdot \frac{h \cdot (V_{n1}) \cdot V_{LM}^2}{2 \cdot \pi \cdot c^2 \cdot (l_q) \cdot r_x}$$

(39)

$$F_{Gt3} = 1.977291424815071 \cdot 10^{-50} \cdot \text{m}^{-1} \cdot \text{henry} \cdot \text{newton}^2$$

$$(IV) \quad F_{Gt4} := \frac{h \cdot (f_{LM})}{r_x} \cdot \mu_o \cdot \frac{h \cdot (f_{LM})}{r_x}$$

(40)

$$F_{Gt4} = 1.982973082194077 \cdot 10^{-50} \cdot \text{m}^{-1} \cdot \text{henry} \cdot \text{newton}^2$$

The four equations above connect two separate magnetic force systems to the electrogravitational force. Notice that the interconnection constant μ_o is present in

all four equations and also that all four equations use terms that were developed for the electric and magnetic force equations previously presented. It can be postulated that this F_G action takes a vector in-line to the motion of the charge-action motion and that it differs from the magnetic force action only by the geometry involved for a two system magnetic interaction. Further, there is a magnetic vector interaction which has a rotational velocity equal to the square root of the quantum magnetic energy divided by the rest mass of the Electron or, $(E_m / m_e)^{1/2}$. This is the fundamental electrogravitational vector interaction velocity, V_{LM} .

The next set of four equations present the weak force in both electric and magnetic terms.

WEAK FORCE QUADSET OF EQUATIONS.

$$(I) \quad F_{Wt1} := \frac{q_o^2}{4 \cdot \pi \cdot \epsilon_o \cdot r_x^2} \cdot \left(\frac{\pi}{\epsilon_o} \right) \cdot \frac{\mu_o \cdot q_o^2 \cdot V_{LM}^2}{4 \cdot \pi \cdot r_c \cdot r_x}$$

$$(41) \quad F_{Wt1} = 2.675821566980811 \cdot 10^{-20} \cdot \text{kg}^{-1} \cdot \text{henry} \cdot \text{newton}^3$$

$$(II) \quad F_{Wt2} := \frac{q_o^2 \cdot (t_h) \cdot (f_h)}{4 \cdot \pi \cdot \epsilon_o \cdot r_x^2} \cdot \left(\frac{\pi}{\epsilon_o} \right) \cdot \frac{q_o^2 \cdot (t_c) \cdot (f_{LM})}{4 \cdot \pi \cdot \epsilon_o \cdot r_c \cdot r_x}$$

$$(42) \quad F_{Wt2} = 2.679663257031196 \cdot 10^{-20} \cdot \text{kg}^{-1} \cdot \text{henry} \cdot \text{newton}^3$$

$$(III) \quad F_{Wt3} := \frac{h \cdot (V_{n1})}{2 \cdot \pi \cdot r_x^2} \cdot \left(\frac{\pi}{\epsilon_o} \right) \cdot \frac{h \cdot (V_{n1}) \cdot V_{LM}^2}{2 \cdot \pi \cdot c^2 \cdot r_c \cdot r_x}$$

$$(43) \quad F_{Wt3} = 2.675821614375385 \cdot 10^{-20} \cdot \text{kg}^{-1} \cdot \text{henry} \cdot \text{newton}^3$$

$$(IV) \quad F_{Wt4} := \frac{h \cdot (f_h) \cdot r_c}{r_x \cdot r_x} \cdot \left(\frac{\pi}{\epsilon_o} \right) \cdot \frac{h \cdot (f_{LM}) \cdot l_q}{r_c \cdot r_x}$$

$$(44) \quad F_{Wt4} = 2.679663265581642 \cdot 10^{-20} \cdot \text{kg}^{-1} \cdot \text{henry} \cdot \text{newton}^3$$

The weak force follows the $1 / r_x^3$ dimensional expression where force falls off very rapidly as the distance from the center of energy increases. The weak force geometry gives rise to a connection particle called the Z^0 particle which has only recently been verified to exist as the Quantum Electrodynamics Theory predicted should exist. This particle has an energy of 91.2 GeV.

 Note: To help put the above in perspective as far as force -field magnitudes are concerned for a given distance of particle separation, page 110 of Scientific American (January 1990) in the article "Handedness of the Universe" states that "*The weak force is 1000 times less powerful than the electromagnetic force and 100,000 times less powerful than the strong nuclear force.*"

The next set of four force equations are for the strong nuclear force.

STRONG FORCE QUADSET OF EQUATIONS.

$$(I) \quad F_{St1} := \frac{q_o^2}{4 \cdot \pi \cdot \epsilon_o \cdot r_x^2} \cdot \left(\frac{2 \cdot \pi \cdot r_{n1}}{\epsilon_o \cdot r_x} \right) \cdot \frac{\mu_o \cdot q_o^2 \cdot V_{LM}^2}{4 \cdot \pi \cdot r_c \cdot r_x}$$

(45)

$$F_{St1} = 5.351643133961623 \cdot 10^{-20} \cdot \text{kg}^{-1} \cdot \text{henry} \cdot \text{newton}^3$$

$$(II) \quad F_{St2} := \frac{q_o^2 \cdot (t_h) \cdot (f_h)}{4 \cdot \pi \cdot \epsilon_o \cdot r_x^2} \cdot \left(\frac{2 \cdot \pi \cdot r_{n1}}{\epsilon_o \cdot r_x} \right) \cdot \frac{q_o^2 \cdot (t_c) \cdot (f_{LM})}{4 \cdot \pi \cdot \epsilon_o \cdot r_c \cdot r_x}$$

(46)

$$F_{St2} = 5.359326514062391 \cdot 10^{-20} \cdot \text{kg}^{-1} \cdot \text{henry} \cdot \text{newton}^3$$

$$(III) \quad F_{St3} := \frac{h \cdot (V_{n1})}{2 \cdot \pi \cdot r_x^2} \cdot \left(\frac{2 \cdot \pi \cdot r_{n1}}{\epsilon_o \cdot r_x} \right) \cdot \frac{h \cdot (V_{n1}) \cdot V_{LM}^2}{2 \cdot \pi \cdot c^2 \cdot r_c \cdot r_x}$$

(47)

$$F_{St3} = 5.351643228750769 \cdot 10^{-20} \cdot \text{kg}^{-1} \cdot \text{henry} \cdot \text{newton}^3$$

$$(IV) \quad F_{St4} := \frac{h \cdot (f_h) \cdot r_c}{r_x} \cdot \frac{r_c}{r_x} \cdot \left(\frac{2 \cdot \pi \cdot r_{n1}}{\epsilon_0 \cdot r_x} \right) \cdot \frac{h \cdot (f_{LM})}{r_c} \cdot \frac{1}{r_x} q$$

$$(48) \quad F_{St4} = 5.359326531163284 \cdot 10^{-20} \cdot \text{kg}^{-1} \cdot \text{henry} \cdot \text{newton}^3$$

It is of interest that the weak and strong force equations have both the electric and magnetic force expressions as products and have the connecting term of 1 over the permittivity of free space which is also the central connecting term. Also it should be noted that for the strong force, the force falls off even more rapidly than for the weak force, where the strong force falls off at the $1 / (r_x^4)$ rate. That means that the weak and the strong force cannot exist outside the nucleus where the given radius is on the order of less than one Fermi. (One Fermi is on the order of 1×10^{-15} meters.) Thus the strong and weak forces are not long range forces as are the electric, magnetic, and gravitational force fields.

The previous pages 14 through 19 have presented the five aforementioned force fields in four cases each where the four cases each present the associated force field in different aspects of geometrical constants such as the Bohr radius, the electric quantum field potential energy frequency f_h , the magnetic quantum potential field energy frequency f_{LM} , and the associated basic electron charge. These equations form the basic construct for the unification of the five forces but are not the only aspect equations that may be considered. For instance, the previous equation (12) presented the power involving the Poynting vector and this can be related to F_E , F_M , and F_G also.

For the electric force and S_h :

$$(49) \quad S_h := \frac{h \cdot (V_{n1})}{2 \cdot \pi \cdot r_c} \quad S_h = 5.974424127843209 \cdot 10^{-16} \cdot \text{joule}$$

$$(50) \quad S_{h\Delta} := \frac{h \cdot (V_{n1})}{2 \cdot \pi \cdot r_x} \quad S_{h\Delta} = 4.359748231216787 \cdot 10^{-18} \cdot \text{joule}$$

For the electric force and S_h :

$$(51) \quad F_{E\Delta} := \frac{S_h}{r_x} \quad F_{E\Delta} = 1.129002454117828 \cdot 10^{-5} \cdot \text{newton}$$

For the magnetic force and S_h :

$$(52) \quad F_{m\Delta} := \frac{S_h \cdot V_{LM}^2}{c^2 \cdot r_c} \quad F_{m\Delta} = 1.254383720145065 \cdot 10^{-22} \cdot \text{newton}$$

For the electrogravitational force and S:

$$(53) \quad F_{G\Delta} := \frac{S_h \cdot V_{LM}^2}{c^2 \cdot r_c} \cdot \mu_o \cdot \frac{S_h \cdot V_{LM}^2}{c^2 \cdot r_c}$$

$$F_{G\Delta} = 1.977291419608158 \cdot 10^{-50} \cdot \text{m}^{-1} \cdot \text{henry} \cdot \text{newton}^2$$

It is of interest to note that the electrogravitational force-action occurs not only at long ranges but at the Compton radius of the electron or proton charge-equivalent particle and thus is quite different insofar as the force-action mechanism compared to the other four force-action mechanisms. (Note the r_c term as well as the delta r_x term above in the electrogravitational expression, equ. (49) & (53).)

It should be noted at this time that S_h in equation (49) is not the same as S_{\max} of equation (12) since S_h in equation (49) is that quantum power obtained in equation

(15) which is expressed in energy/second which was obtained by the reduction to quantum power from power (max.) in equation (12). Equation (54) below further illustrates the quantum magnitude of S_h .

$$(54) \quad S_{\text{QuantumTorus}} := m_e \cdot c^2 \cdot \alpha$$

$$S_{\text{QuantumTorus}} = 5.974424089815703 \cdot 10^{-16} \cdot \text{joule}$$

Note that in equation (54) S_h is written as $S_{\text{QuantumTorus}}$ but they are one and the same. The $S_{\text{QuantumTorus}}$ is pertinent to the reduction of the S_{TorusMax} value in equation (14) by equation (15) which arrives at an energy that in magnitude is equivalent to power as time is taken at unity. Since the volume of a torus is $2 \pi^2 r^3$ then equation 14 is further clarified by equation (55) below wherein energy density is related to torus volume instead of cylindrical volume.

$$(55) \quad E_{\text{DTorus}} := \frac{q_o^2 \cdot c}{8 \cdot \pi^3 \cdot \epsilon_o \cdot r_c^4} = \left(\frac{q_o^2}{4 \cdot \pi \cdot \epsilon_o \cdot r_c} \right) \cdot \frac{c}{2 \cdot \pi^2 \cdot r_c^3}$$

or, $E_{\text{DTorus}} = 1.575750434657439 \cdot 10^{29} \cdot \text{m}^{-2} \cdot \text{watt}$

Again, the power related to energy density (max.) reduces to potential field energy (max.) at the Compton radius of the electron when the volume of the field involved is torus volume where both radius vectors are equal to each other and the energy density (max.) is multiplied by the Compton area and time of the electron as shown previously in equation (15) page 9.

The torus area also applies to the geometry of the electron wherein equation (16) page 9 utilized the area expression of the torus at the Compton radius of the electron, which is $4 \pi^2 r_e^2$. In equation (16) the Compton electron time divided by the

Compton torus area yields a fundamental constant that herein is labeled as $1 / G_0$. Note that the electron rest mass multiplied by $G_0 = h$ which is Planks constant and that the two forms of the Heisenberg expression for energy and momentum related to h contain G_0 in the $m \times (v^2) \times (t) = h$ and $m \times (v) \times (2 \times (\pi) \times r) = h$ expressions in the portions contained within the parentheses.

Within the aspect of the quantum force fields there may likely exist a quantum acceleration constant and thus in equation (56) below it is defined by the quantum terms of interaction, h , f_h , f_{Lm} , and the electron field mass at r_e .

$$(56) \quad A_{emt} := \sqrt{\frac{h \cdot f_h \cdot f_{LM}^2}{m_e \cdot \alpha}} \quad \text{or,} \quad A_{emt} = 3.007592302103937 \cdot 10^9 \cdot m \cdot \text{sec}^{-2}$$

This quantum acceleration is active at the the Compton radius of the electron and is directly field related and therefore influences the electron momentum. This is shown below where where the quantum field acceleration is applied to the rest mass of the electron in the case of the electrogravitational force at the Bohr radius of Hydrogen.

$$(57) \quad F_{GT1} := 4 \cdot \pi^2 \cdot \mu_o \cdot (m_e \cdot \alpha \cdot A_{emt})^2 \quad (\text{At the } r_{n1} \text{ radius.})$$

$$F_{GT1} = 1.982973054935436 \cdot 10^{-50} \cdot m^{-1} \cdot \text{henry} \cdot \text{newton}^2$$

In equation (57) above the quantum field acceleration is applied to the rest mass of the electron and the resultant force products yield the quantum electrogravitational force. This acceleration is most likely related to circular field motion in the quantum sense. No loss of field energy due to radiation is detectable and the field is likened to a standing wave.

In the past the question has been posed, "how can the electron located in an orbital remain in a stable orbital without falling into the nucleus since it is undergoing

acceleration by constantly changing direction?" (A charged particle that undergoes acceleration will radiate energy in the form of an electromagnetic wave causing that particle to give up its kinetic energy to wave energy.) This question is founded on the velocity having the two-component definition of direction as well as speed. A change of direction or speed will cause acceleration in other words. The answer is; *the action which makes a charge-particle radiate electromagnetically is a change in its kinetic energy which is a change in its linear speed.* For a charge-particle in orbital motion, a change in the radians per second or angular velocity would have to occur and this does not happen in a stable orbital. Note that one form of orbital acceleration is related to $\text{Force} = m \times a$ and also $\text{Force} = m \times v^2 / r$ so that $a = v^2 / r$ and this form of expressing acceleration is not time-dependent. Another way of expressing acceleration is where $a = (d1-d2) / (t1-t2)^2$ which is time dependent and thus related to frequency or a change in angular rate. It is this second definition of acceleration that causes electromagnetic radiation from a charge-particle. A stable electron orbital can have the first form of non-time dependent acceleration and not radiate electromagnetic energy. However, field energy is flowing to its terminus counterpart but it is not radiating away since it is a standing-wave energy.

Thus, there exists a resonant condition where the field is in circular motion but is purely reactive in nature and is not connected to the impedance of free space. When energy is coupled to the impedance of free space it radiates with maximum efficiency when the source impedance matches the load impedance. (Coupled is another term for impedance matched.) The cross-product of force terms above in

equation (57) using the $4 \pi^2 \mu_0$ term implies however that a small portion of each force term can interact with each other.

Equation (58) below shows how the quantum acceleration term is related to the rest mass of the electron. Again, two frequencies f_c and f_{LM} are involved.

$$(58) h_{t1} := \frac{(A_{em}^2) \cdot m_e}{(f_{LM}^2) \cdot f_c} \text{ or, } h_{t1} = 6.626075499542029 \cdot 10^{-34} \cdot \text{sec joule}$$

The two aforementioned frequencies are fundamental field interaction frequencies for the electric and magnetic fields respectively. They are very basic quantum derived field frequencies related to the electric and magnetic field energy flow between charged particles.

It is entirely possible to relate this energy flow to the quantum acceleration term A_{em} on page 22 previous wherein that energy flow has a field rotational vector velocity V_{LM} and the quantum frequencies f_{LM} and f_c . This is shown in (59) below. V_{LM} is the rotational vector velocity of the quantum magnetic field which is equal to $8.542454608 \times 10^{-2}$ m/s, f_c is the Compton frequency related to the electron rest mass, and f_{LM} is the electrogravitational interaction frequency as well as the quantum magnetic frequency.

$$(59) \quad A_{em} := (V_{LM}) \cdot \sqrt{(f_c) \cdot (f_{LM})}$$

or, $A_{em} = -3.005435617341997 \cdot 10^9 \cdot m \cdot \text{sec}^{-2}$

The above is the described field motion that was previously presented for equation (57) previous.

Figure (60) on the next page is much the same expression where A_{em} is

expressed in terms of time rather than frequency and t_c and f_c are Compton related time and frequency respectively. In quantum terms the field motion describes the particle action-line and is the reason the particle can be ascribed motion at all. Putting it another way, quantum field motion is more basic than the apparent observed particle position or velocity. The particle follows the field and not the other way around. This is why the electron does not fall into the nucleus. The field geometry will not allow it to do so as the particle has to follow the geometry allowed by the lowest energy state of the field.

$$(60) \quad A_{em} := \frac{V_{LM}}{\sqrt{t_c \cdot \left(\frac{1}{f_{LM}}\right)}} \quad \text{or, } A_{em} = -3.005435617341996 \cdot 10^9 \cdot \text{m} \cdot \text{sec}^{-2}$$

From all of the preceding it becomes possible to postulate that there is a basic quantum frequency related to the quantum acceleration term, the Compton frequency f_c , and the quantum magnetic frequency term f_{LM} . This is shown in equation (61) below. This frequency is likely to exist although it very likely has not been taken for what it is in the cosmic background radiation all around us.

$$(61) \quad f_{at} := \sqrt{f_{LM} \cdot f_c} \quad \text{or, } f_{at} = 3.520758889564392 \cdot 10^{10} \cdot \text{Hz}$$

The frequency shown in equation (61) above is basic in that it yields the same wavelength whether wavelength is derived from $\lambda = C / f$ or whether $\lambda = h / m_e \times (V_{LM}) = 8.514995423 \times 10^{-3}$ meters. The only time that this happens is when the Compton energy for the electron is related to frequency and then that frequency is divided into the velocity of light. That will yield the same wavelength as

when h is divided by $m \times c$. This does not happen for the quantum orbitals for example where multiples of the fine structure constant result when a frequency (classic) is divided by a frequency (quantum).

Lambda (VLm) is the fundamental electrogravitational and magnetic wavelength as set forth by the previous introduction to the concept of electrogravitation as this paper has presented and the frequency in equation (61) is an associated frequency. This frequency of interaction occurs in the quantum magnetic interaction of charge-fields at the Compton wavelengths of the interaction particles concerned. (It is electromagnetic-wave-like but interacts at the Compton wavelength of an interaction particle.) This is seen in the r_c terms in equations (37), (38), and (39) on page 16 previous. Also, this is applicable to the electrogravitational case only and thus the quantum field action for the electrogravitational field has the particles Compton radius as two of the radius terms and the other two radius terms are macroscopically variable radius terms.

In equation (62) below another form of the quantum case of the electrogravitational force is presented where the function of a power product in quantum electromagnetic terms is shown along with the free space resistance for that electromagnetic wave and where the force interaction as a whole depends on the Compton wavelength of the particles of interaction as well as the variable distance between them. (Squared).

$$(62) \quad F_{Gt3} := \frac{(376.73 \cdot \Omega) \cdot (q_o^2) \cdot V_{LM}^2}{4 \cdot \pi \cdot (c) \cdot l_q \cdot r_x} \cdot \mu_o \cdot \frac{(376.73 \cdot \Omega) \cdot (q_o^2) \cdot V_{LM}^2}{4 \cdot \pi \cdot (c) \cdot l_q \cdot r_x}$$

or, $F_{Gt3} = 1.977288099896321 \cdot 10^{-50} \cdot m^{-1} \cdot \text{henry} \cdot \text{newton}^2$

Equation (40) back on page 16 shows best that in the electrogravitational

equations presented previously the resultant interaction force is basically the result of h^2 or quantum power squared. There exists a quantum mechanics expression (the result of matrix mathematics) that relates the position operator \mathbf{q} and the momentum operator \mathbf{p} to the complex number i times $(h / 2 \times \pi)$. This is shown below in equation (63).

$$(63) \quad i \times (h / 2 \times \pi) = (\mathbf{p} \times \mathbf{q} - \mathbf{q} \times \mathbf{p})$$

When the above expression is inserted for the value of h in equation (40) the equation (64) below is the result.

$$(64) \quad FG = \frac{2 \cdot \pi \cdot (\mathbf{pq} - \mathbf{qp}) \cdot (\mathbf{f}_{LM})}{(i) \cdot r_x} \cdot \mu_o \cdot \frac{2 \cdot \pi \cdot (\mathbf{pq} - \mathbf{qp}) \cdot (\mathbf{f}_{LM})}{(i) \cdot r_x}$$

This is leading to a very interesting result, since the square of i is equal to (-1) . Note also that $2 \times \pi \times f_{LM}$ is ω_{LM} in radians per second. Equation (65) on the next page presents the resultant electrogravitational force as a negative $(-)$ force. A negative $(-)$ force is one of attraction within the conventional viewpoint of physics. It is also suggested that if one of the $(\mathbf{pq} - \mathbf{qp})$ terms should yield a $(-)$ result then the force of gravity would be one of repulsion as the F_G force would become positive.

$$(65) \quad -FG = \frac{(\mathbf{pq} - \mathbf{qp}) \cdot \omega_{LM}}{r_x} \cdot \mu_o \cdot \frac{(\mathbf{pq} - \mathbf{qp}) \cdot \omega_{LM}}{r_x}$$

The relationship of i to the quantum electric and magnetic force fields can also be presented by solving equation (63) previous for h and then substituting this h function for h in equation (29) for quantum electric force which was presented in terms of h and V_{n1} . Equation (66) (next) illustrates i in terms of the quantum electric force in

equation (29). The force sign can be either (+) or (-) by reason of the V_{n1} term.

$$(66) \quad FE = \frac{(pq - qp) \cdot (V_{n1})}{(i) \cdot \Delta r_x^2}$$

Equation (67) below illustrates i in terms of the quantum magnetic force from equation (34). The fact that electric and magnetic fields can exhibit a force of attraction or repulsion is due to the fact that the delta force terms in (66) and (67) rely on the vector nature of the V_{n1} term which can relate either to an aiding or opposing field structure. It is also suggested that either a capacitive or inductive situation can

$$(67) \quad FM = \frac{(pq - qp) \cdot (V_{n1})}{(i) \cdot C^2 \cdot \Delta r_x^2}$$

exist in quantum field terms. That is, reactive power can be nearly the whole of the field action force and thus exhibit real "static" forces but use virtually no real power in the force-field interaction. Note that the V_{n1} term is a real constant and relates to a rotational constant related to the quantum charge of the electron or quantum charge in general. The electrogravitational force expression in equation (39) shows this as well as in the weak and strong force expressions in equations (43) and (47) respectively. This rotational field velocity has an associated deBroglie matter wave that cannot be shielded against. (At least not in the conventional sense of shielding such as enclosing a volume of space by use of a metallic box, or the like.)

For the sake of presenting an easier to conceptualize view of the electron an its associated field the orbital description was presented wherein the electron follows a line around the nucleus in a well defined path. Alas, it actually resembles a cloud around the nucleus wherein the orbital position is the most probable location of the

electron at any given instant of time. That is, the square of the energy operator yields the most probable location in the field that the electron may be located at. This can apply to uncharged particles as well and has to do with the real uncertainty of where particles are in the quantum sense.

This may be expanded upon by saying that ***a matter-field is that particle displaced from its most probable location in space-time such that the time that the particle spends at some distance from its most probable location is inversely proportional to the distance from its most probable location.***

Since the concept of matter-fields is basic to all particles then the field around a charge-particle can also be considered to be the electron-charge displaced in the same manner as for the matter-field. All of this happens instantaneously within the established field out to the limits of the field. Then also the total time spent in all of the field displacement positions is less than the Compton time related to the rest mass energy of the electron. This is also related to the accepted concept of *action at a distance*.

The relativistic expressions for distance and time can be arranged such that the terms relating to the radical in each expression equate to a common radical and thus the resulting time and distance ratio can lead to some interesting results when t_x is allowed to become less than t_0 in the quantum sense. **This causes d_x to increase.** This relationship is shown in equation (68) below.

$$(68) \quad d_x / d_0 = \text{sq rt} (1 - v^2 / c^2) = t_0 / t_x$$

Again, when the quantum aspect of time and distance, (where the time and distance base terms are the Compton time and radius of the particle being considered), the

expression shown involves a common connection of terms for the relativistic as well as the quantum aspect of action at a distance. It is but one step in logic to realize that on a quantum scale if particles could be aligned in the proper phase and with the proper time characteristics and then impacted all at once with enough energy through a laser action of stimulation then all of the particles would displace to some new point in space-time. On a macroscopic scale this could have a significant effect on the particles new surroundings if enough particles participated in the distance transition displacement and other particles were already at the new location. Also, this action could not be shielded against as the action described does not transit through normal space as was shown by equation (68) where the action is shown to be partially independent of relativistic constraints. The new location would depend only on the phase of the impact energy and the frequency thereof for each particle impacted. The action would also be instantaneous.

This type of action at a distance is illustrated by the quantum jump of the electron from one orbital energy level to another where it has been noted that the action would have to be instantaneous in order that the laws of conservation of energy and momentum be conserved. Also the tunneling affect of the electron across an energy barrier is another famous example of action at a distance and in another case where in the famous two-slit experiment where the particle matter-field demonstrates that the particle can apparently be in two places at the same time! In fact the entire particle-wave duality principle of quantum mechanics is just this type of particle action wherein it appears that any given particle can at the same time be both a particle and a wave and that the particle can be in more than place in any given time within an established probability field.

One could now conceive of displacing an entire vehicle of some design in discrete steps at a rate dependent only on the desired velocity relative to some beginning point and perhaps also realize that the "top end" is theoretically unlimited. Also since the displacement is through hyperspace then normal objects would not be a barrier.

Previously the energy that created "field" energy was compared to the creation energy input and also how particles that exhibited fields came from and utilized that same energy source but "gated" that energy in order that a definite amount of field was created with each particle's restoring pulse. Imagine what would happen if that miniature creation pulse width in Compton time were to suddenly open up to a constantly "on" condition with nothing to restrict the energy output. The result would be another "Big Bang". It is fortuitous indeed that nature keeps house so very well as regards to time and this has not happened. (Except perhaps in the beginning, 15 billion years or so ago.)

In concluding chapter one would like to point out that in the effort to simplify this presentation a great deal of difficult but beautiful mathematics was not presented concerning the quantum aspects of field theory but this is readily available to those desiring to explore the subject in greater depth.

After pondering upon the order that is involved in the immense totality of the Universe I for one have to say that this grand organized design did not, or better yet, could not have been brought into existence by random chance, but by the "hand" of an All Powerful Creator.

32a

The table of constants are repeated below to allow for the equations that follow to be active and thus respond to changes in the variables input by the reader.

1. Gravitational Constant, $G := 6.672590000 \cdot 10^{-11} \cdot \frac{\text{m}^3}{\text{kg} \cdot \text{sec}^2}$
2. Speed of light, $c := 2.997924580000000 \cdot 10^8 \cdot \text{m} \cdot \text{sec}^{-1}$
3. Magnetic permeability, $\mu_0, \mu_o := 1.256637061000001 \cdot 10^{-6} \cdot \frac{\text{newton}}{\text{amp}^2}$
4. Electric permittivity, $\epsilon_0, \epsilon_o := 8.854187817000001 \cdot 10^{-12} \cdot \frac{\text{farad}}{\text{m}}$
5. Bohr n1 Velocity, $V_{n1}, V_{n1} := 2.187691415844453 \cdot 10^6 \cdot \frac{\text{m}}{\text{sec}}$
6. Electron charge, $q_0, q_o := 1.602177330000001 \cdot 10^{-19} \cdot \text{coul}$
7. Electron mass, $m_e, m_e := 9.109389700000001 \cdot 10^{-31} \cdot \text{kg}$
8. Compton Electron radius, $r_c, r_c := 3.861593228000001 \cdot 10^{-13} \cdot \text{m}$
9. Bohr Radius, $r_{n1}, r_{n1} := 5.291772490000000 \cdot 10^{-11} \cdot \text{m}$
10. Fine structure constant, $a, \alpha := 7.297353080000001 \cdot 10^{-03}$
11. Plank constant, $h, h := 6.6260755 \cdot 10^{-34} \cdot \text{joule} \cdot \text{sec}$
12. Compton Electron time, $t_c, t_c := 8.0933010000001 \cdot 10^{-21} \cdot \text{sec}$
13. Quantum electromagnetic frequency, $f_{Lm}, f_{LM} := 1.00322480500001 \cdot 10^1 \cdot \text{Hz}$
14. Quantum electric field frequency, $f_h, f_h := 9.016534884 \cdot 10^{17} \cdot \text{Hz}$
15. Quantum acceleration field constant, $A_{em}, A_{em} := 3.007592302 \cdot 10^{09} \cdot \frac{\text{m}}{\text{sec}^2}$
16. Field acceleration frequency constant, $f_a, f_a := 3.520758889 \cdot 10^{10} \cdot \text{Hz}$

32b

17. Free space resistance, R_s , $R_s := \mu_0 \cdot c$ and $1 \cdot \Omega = 1 \cdot \text{kg} \cdot \text{m}^2 \cdot \text{sec}^{-1} \cdot \text{coul}^{-2}$

$$R_s = 376.7303133310863 \cdot \text{ohm}$$

and/or... $R_s := \frac{1}{\epsilon_0 \cdot c}$

$$R_s = 376.730313488167 \cdot \text{ohm}$$

18. Quantum Hall Ohm, R_Q , $R_Q := \frac{h}{q_0^2}$

$$R_Q = 2.58128058743606 \cdot 10^4 \cdot \text{ohm}$$

Additional related constants are included for the discussions past page 21 below.

	(SUN MASS)		(SUN rad.)
$m_r := 1.99 \cdot 10^{30} \cdot \text{kg}$	= 1.99 x 10³⁰ kg	$r_s := 6.96 \cdot 10^8 \cdot \text{m}$	= 6.96 x 10⁸ m

$$\pi := 3.141592654000001$$

$$m_p := 1.672623100000001 \cdot 10^{-27} \cdot \text{kg}$$

$$m_e := 9.109389700000001 \cdot 10^{-31} \cdot \text{kg}$$

$$l_q := 2.817940920000001 \cdot 10^{-15} \cdot \text{m}$$

$$m_a := 1.660540200000001 \cdot 10^{-27} \cdot \text{kg}$$

Note.....

((V_{n1} & V_{LM} are SELECT))

$$V_{n1} := 2.187691415844453 \cdot 10^6 \cdot \text{m} \cdot \text{sec}^{-1}$$

$$V_{LM} := -0.085363289893272 \cdot \text{m} \cdot \text{sec}^{-1}$$

NOTE: $\frac{V_{n1}}{V_{LM}^2} = 3.002228710934959 \cdot 10^8 \cdot \text{m}^{-1} \cdot \text{sec}$

$$V_n := \frac{V_{n1}}{\alpha}$$

$$\frac{V_n}{c} = 0.999999999587411$$

$$\lambda_{\Delta} := 2 \cdot \pi \cdot r_{n1} \quad m_{\Delta} := m_e \quad t_{\Delta} := \frac{h}{m_e \cdot V_{n1}^2} \quad r_x := r_{n1}$$

$t_h := \frac{t_c}{\alpha}$ $f_h := \frac{1}{t_h}$ and constants in general that are also used are:

$t := 1 \cdot \text{sec}$ $Q_i := q_0 \cdot t^{-1}$ $L := 1 \cdot \text{m}$

Electrogravitation and the Special Theory

Chapter 2

Einstein's Special Theory of Relativity has yielded some curious results concerning the electric (E) and magnetic (B) fields which will now be presented in a way that will show how the electrogravitational field can be generated from the atomic level of the most simple case, the Hydrogen atom. Further an explanation of why the electron cannot fall into the nucleus due to the perfect balance between the electric and magnetic force fields will also be examined.

The Lorentz transformation of the electric and magnetic fields is referenced in SPECIAL RELATIVITY by Albert Shadowitz, Dover Publications Inc., New York, 1988 printing, pages 106-110, and the ENCYCLOPEDIA OF MODERN PHYSICS, article by John D. McGervey on Special Relativity, Academic Press Inc., 1989 printing, pages 632-633 are presented below.

Let the variables be defined as: $N := 1$ (Turns) $\theta := \frac{\pi}{2}$ deg.

$$\sin(\theta) = 1 \quad v := V_{n1}$$

$$(69) \quad E := \frac{q_o}{4 \cdot \pi \cdot \epsilon_o \cdot r_{n1} \cdot r_c} \quad (70) \quad B := \frac{\mu_o \cdot N \cdot q_o \cdot \sin(\theta)}{4 \cdot \pi \cdot l \cdot q \cdot r_c} \cdot V_{n1}$$

Then, (71) $F' := q_o \cdot (E + V_{n1} \cdot B)$ Note that $\sin \theta$ can be + or -.

$$F' = 2.258004888709334 \cdot 10^{-5} \cdot \text{newton}$$

where; $q_o \cdot V_{n1} \cdot B = 1.129002444354667 \cdot 10^{-5} \cdot \text{newton} = (F \text{ mag.})$

and $q_o \cdot E = 1.129002444354667 \cdot 10^{-5} \cdot \text{newton} = (F \text{ elec.})$

The previous equation (71) is considered here as the definition of both E and B and is likewise presented in the first reference as the definition of both also. The next equation (72) presents the relativistic form related to the above as:

Let $v_x := V_{n1}$ And.... defining V_{n1} as the velocity as above,

$$(72) \quad F'' := \left(\frac{q_o^2}{4 \cdot \pi \cdot \epsilon_o \cdot r_{n1} \cdot r_c} \right) \cdot \left[1 - \left(\frac{v_x}{c} \right)^2 \right]$$

Where.

$$(73) \quad F_{elec} := \frac{q_o^2}{4 \cdot \pi \cdot \epsilon_o \cdot r_{n1} \cdot r_c} \quad \text{and,} \quad (74) \quad F_{mag} := \left(\frac{v_x^2}{c^2} \right) \cdot F_{elec}$$

If the velocity term in the magnetic expressions above is taken as V_{n1} then the magnetic force will exactly balance out the electric force at the r_{n1} orbital of Hydrogen and thus the below equation is presented as the situation that explains how the forces balance to yield a stable orbital.

$$(74) \quad F_{n1} := \left(\frac{q_o^2}{4 \cdot \pi \cdot \epsilon_o \cdot r_{n1} \cdot r_c} - \frac{\mu_o \cdot q_o^2 \cdot V_{n1}^2}{4 \cdot \pi \cdot l \cdot q \cdot r_c} \right)$$

Applying Mathcads symbolic processor to simplify and find the exact solution:

$$(75) \quad F_{n1} := \frac{-1}{4} \cdot q_o^2 \cdot \frac{(-l \cdot q + \mu_o \cdot V_{n1}^2 \cdot \epsilon_o \cdot r_{n1})}{\left[\pi \cdot \left[\epsilon_o \cdot \left[r_{n1} \cdot (r_c \cdot l \cdot q) \right] \right] \right]}$$

$$F_{n1} = 0 \cdot \text{newton} \quad \text{Forces are equal and opposite.}$$

It is immediately apparent from (74) above that r_{n1} will change inversely as the square of the orbital velocity and the electric forces will still exactly balance the opposite magnetic forces.

Now let this be postulated:

The universe is still in the expansion phase and therefore energy is still decreasing per unit volume per unit time even if locally that cannot be perceived and that this is a cause for the above equation to be slightly unbalanced in the radiative mode for the magnetic force energy and resultant effect will be expressed as the following:

$$(76) \quad F_{MQta} := \left[\frac{q_o^2}{4 \cdot \pi \cdot \epsilon_o \cdot r_{n1} \cdot r_c} - \frac{\mu_o \cdot q_o^2}{4 \cdot \pi \cdot l_q \cdot r_c} \cdot V_{n1}^2 - \left(\frac{\mu_o \cdot q_o^2}{4 \cdot \pi \cdot l_q \cdot r_{n1}} \cdot V_{LM}^2 \right) \right]$$

$$\text{or, } F_{MQta} := \frac{-1}{4} \cdot q_o^2 \cdot \frac{(-l_q + \mu_o \cdot V_{n1}^2 \cdot \epsilon_o \cdot r_{n1} + \mu_o \cdot V_{LM}^2 \cdot \epsilon_o \cdot r_c)}{\left[\pi \cdot \left[\epsilon_o \cdot \left[r_{n1} \cdot (r_c \cdot l_q) \right] \right] \right]}$$

$$\text{thus, } F_{MQta} = -1.254383710426251 \cdot 10^{-22} \cdot \text{newton}$$

And please note that the extract expression from (76) above of:

$$(77) \quad m_t := \left(\frac{\mu_o \cdot q_o^2}{4 \cdot \pi \cdot l_q} \right) \quad \text{is equal to the rest mass of the Electron.}$$

$$\text{or, } m_t = 9.109389687063751 \cdot 10^{-31} \cdot \text{kg}$$

$$\text{where } m_e = 9.109389700000003 \cdot 10^{-31} \cdot \text{kg}$$

Thus two important connections are now established by (76) and (77) where in (76) the basic construct for the atomic radiation of the feeble magnetic force is related to the least quantum velocity V_{LM}^2 (which is caused by natural entropic action) and in (77) the mass of the Electron is tied directly to the least quantum magnetic energy expression.

The next equation is the natural result of combining the statement for the one atomic system in (76) with an identical energy acceptor system through the permeability constant as in equation (37) previous in chapter one.

$$(78) \quad F_{MQtb} := \left[\frac{q_o^2}{4 \cdot \pi \cdot \epsilon_o \cdot r_{n1} \cdot r_c} - \frac{\mu_o \cdot q_o^2}{4 \cdot \pi \cdot l_q \cdot r_c} \cdot V_{n1}^2 + \left(\frac{\mu_o \cdot q_o^2}{4 \cdot \pi \cdot l_q \cdot r_{n1}} \cdot V_{LM}^2 \right) \right]$$

$$\text{simplifying, } F_{MQtb} := \frac{-1}{4} \cdot q_o^2 \cdot \frac{(-l_q + \mu_o \cdot V_{n1}^2 \cdot \epsilon_o \cdot r_{n1} - \mu_o \cdot V_{LM}^2 \cdot \epsilon_o \cdot r_c)}{\left[\pi \cdot \left[\epsilon_o \cdot \left[r_{n1} \cdot \left(r_c \cdot l_q \right) \right] \right] \right]}$$

$$\text{or, } F_{MQtb} = 1.254383710426251 \cdot 10^{-22} \cdot \text{newton}$$

Note that the force sign is positive in this case as the formula expresses the case where energy is absorbed into the atomic system instead of radiated.

Multiplying the forces in (76) and (78) above by the permeability of free space we arrive at the electrogravitational expression in (79) below:

$$(79) \quad F_{MQtab} := F_{MQta} \cdot \mu_o \cdot F_{MQtb}$$

$$\text{and, } F_{MQtab} = -1.977291388968526 \cdot 10^{-50} \cdot \text{m}^{-1} \cdot \text{henry} \cdot \text{newton}^2$$

The electrogravitational interaction force is inversely dependent on the Compton radius of the particle interaction as well as being inversely dependent on the square of the distance between them and since mass is now taken to be standing waves that contain locked in electric and magnetic field vectors even *neutral* particles participate in the interaction since the force exchange occurs at an equal or smaller distance than the particle radius acted on by the electrogravitational particle.

The ability of electric and magnetic vector potentials to act at a distance through shielding has been substantiated by a recent experiment documented in SCIENTIFIC AMERICAN, April 1989. page 56, in the article titled "Quantum Interference and the Aharonov-Bohm Effect by Yoseph Imry and Richard A. Webb. The results of the experiment show that electric scalar potential and magnetic vector potential can

exhibit an interaction on shielded particles that from the outside of a shield would appear to have no discernible field but are affected nonetheless. It is thus a direct step in reasoning to arrive at the conclusion that so-called neutral particles can contain charge-fields that from the outside appear to be neutral also. It is postulated here that the electrogravitational interaction particle is very fundamentally the magnetic vector potential and is the portion shown below which is taken in part from the electrogravitational force equations in (76) and (78) previous.

Now let $\theta_1 := \frac{3 \cdot \pi}{2}$ and $\theta_2 := \frac{\pi}{2}$ (In radians)

Then,

$$(80a) \quad \gamma_{Ga} := \left(\frac{\mu_o \cdot q_o^2 \cdot \sin(\theta_1)}{4 \cdot \pi \cdot l_q \cdot r_{n1}} \cdot V_{LM}^2 \right)$$

$$(80b) \quad \gamma_{Gb} := \left(\frac{\mu_o \cdot q_o^2 \cdot \sin(\theta_2)}{4 \cdot \pi \cdot l_q \cdot r_{n1}} \cdot V_{LM}^2 \right)$$

thus,

$$(81a) \quad \gamma_{Ga} = -1.254383710426251 \cdot 10^{-22} \cdot \text{newton} \quad \text{Transfer action particle.}$$

$$(81b) \quad \gamma_{Gb} = 1.254383710426251 \cdot 10^{-22} \cdot \text{newton} \quad \text{Receptor basin conjugate.}$$

$$\text{and,} \quad F_{Gab} := \gamma_{Ga} \cdot \mu_o \cdot \gamma_{Gb}$$

$$\text{or,} \quad F_{Gab} = -1.977291388968526 \cdot 10^{-50} \cdot \text{m}^{-1} \cdot \text{henry} \cdot \text{newton}^2$$

Now let the below expressions yield the magnetic B portion of the force equations in 81 above;

$$(82a) \quad B_{MQta} := \left(\frac{\mu_o \cdot q_o \cdot \sin(\theta_1)}{4 \cdot \pi \cdot l_q \cdot r_{n1}} \cdot V_{LM} \right) \quad \text{and} \quad (82b) \quad B_{MQtb} := \left(\frac{\mu_o \cdot q_o \cdot \sin(\theta_2)}{4 \cdot \pi \cdot l_q \cdot r_{n1}} \cdot V_{LM} \right)$$

$$B_{MQta} = 9.171675459293661 \cdot 10^{-3} \cdot \text{tesla}$$

$$B_{MQtb} = -9.171675459293661 \cdot 10^{-3} \cdot \text{tesla}$$

and, $F_{MQta} := q_o \cdot V_{LM} \cdot B_{MQta}$
 $F_{MQta} = -1.254383710426251 \cdot 10^{-22} \cdot \text{newton}$
 $F_{MQtb} := q_o \cdot V_{LM} \cdot B_{MQtb}$
 $F_{MQtb} = 1.254383710426251 \cdot 10^{-22} \cdot \text{newton}$

and,
 (83) $F_{GMQtab} := (F_{MQta}) \cdot \mu_o \cdot (F_{MQtb})$

or finally, $F_{GMQtab} = -1.977291388968526 \cdot 10^{-50} \cdot \text{m}^{-1} \cdot \text{henry} \cdot \text{newton}^2$

where, $F_G := \frac{G \cdot m_e \cdot m_e}{r_x^2}$ or, $F_G = 1.97729138896852 \cdot 10^{-50} \cdot \text{newton}$

Wherein F_G is the classical gravitational force expression as a comparison.

As a matter of curiosity it may be of interest to investigate the equivalent quantum volts X meter X sec from the Sh equation (52) on page 20 previous.

where again: $S_h := h \cdot \frac{V_{n1}}{2 \cdot \pi \cdot r_c}$

(84a) $S_h = \frac{E_Q \cdot B_{MQta}}{2 \cdot \mu_o}$ and (84b) $E_Q := 2 \cdot \frac{S_h}{B_{MQta}} \cdot \mu_o$

or, $E_Q = 1.637145319958492 \cdot 10^{-19} \cdot \text{volt} \cdot \text{m} \cdot \text{sec}$

The above value of E_Q is conditional on the precept that the electrogravitational photon (or graviton) is like an ordinary photon, but the magnetic vector potential in the graviton is not like the ordinary photon in that the magnetic portion of the graviton is in-line with both the generating charge as well as the receptor charge and is a net pondermotive action which affects the kinetic energy of all matter such that mass equivalent energy is subtracted from the receptor system. (An analogy is that cooling

matter tends to condense but in this case is related to the very fabric of space-time becoming less than it was before the interaction.) Equation (77) is the field mass equivalent of real mass and is part of the B field of the electrograviton. Therefore the result of the electrogravitational action is a cooling of space and repeated pulsating contractions of space-time throughout the universe cause what we take as the gravitational attraction phenomena between mass systems.

Before moving on to chapter three I would like to point out that there exists the intriguing possibility of inductance and capacitance having a least quantum aspect just as the Compton radius of the electron does. After much study of the matter the following formula were developed from the ordinary expressions of inductance and capacitance taking into account the quantum aspects of how they must appear on a quantum scale.

$$(85) \quad \text{First,} \quad r_{LM} := \frac{V_{LM}}{2 \cdot \pi \cdot f_{LM}} \quad \text{or,} \quad r_{LM} = -1.354231820785828 \cdot 10^{-3} \cdot \text{m}$$

then,

$$(86) \quad L_Q := \frac{\pi \cdot \mu_o \cdot (r_{LM}^2)}{l_q}$$

$$L_Q = 2.569294467255001 \cdot 10^3 \cdot \text{henry}$$

$$(87) \quad C_Q := \frac{4 \cdot \pi \cdot \epsilon_o \cdot (r_{LM}^2)}{r_{n1}}$$

$$C_Q = 3.856057120803139 \cdot 10^{-6} \cdot \text{farad}$$

In equations (86) and (87) above the quantum inductance and capacitance depend on other quantum constants such as the classical radius of the electron (l_q) as

well as the Bohr radius of the Hydrogen atom (r_{n1}) and a radius (r_{LM}) derived from the quantum electromagnetic frequency (f_{LM}) and the quantum vector rotation velocity (V_{LM}). If we now consider the time and impedance related to the derived inductance and capacitance, L_Q and C_Q , we arrive at the following equations below.

$$(88) \quad T_Q := \sqrt{L_Q \cdot C_Q} \quad \text{or,} \quad T_Q = 0.099535653038993 \cdot \text{sec}$$

$$\text{and} \quad \frac{1}{T_Q} = 10.04665132008782 \cdot \text{Hz} = f_{LM}$$

The quantum time above is likened to the times derived from transmission line parameters relating delay along the line to the lumped L and C parameters of the line. The impedance equivalent can also be arrived at in similar fashion.

or,

$$(89) \quad Z_Q := \sqrt{\frac{L_Q}{C_Q}} \quad Z_Q = 2.581280565114179 \cdot 10^4 \cdot \text{ohm}$$

(Which is equal to the derived value of the classical quantum ohm, R_Q .)

If a superconducting surface was filled with quarter wavelength pockets equal in depth to $1/4 \lambda_{LM}$ such that a proper magnetic field could cause the incoming electrogravitational packet of magnetic energy to resonate and form standing waves on the surface of the superconducting surface then the counter action force would be away from the direction of the incoming electrogravitational energy. Ergo, momentum reversed gravitational action. In so doing the surface would likely glow with radiant energy due to the action of these strong field interactions with air molecules as well as primary microwave and visible radiation being sent forth directly from the standing

wave surface itself.

It can be shown that the inductance and capacitance have a direct relationship in the electrogravitational interaction between two systems by the following equation.

$$(90) \quad F_{GCLQt} := \frac{h}{L_{Q \cdot r_{n1}}} \cdot \mu_o \cdot \frac{h}{C_{Q \cdot r_{n1}}}$$

$$\text{or,} \quad F_{GCLQt} = 1.988671067216686 \cdot 10^{-50} \cdot \text{m}^{-1} \cdot \text{henry} \cdot \text{newton}^2$$

$$\text{where,} \quad F_G = 1.97729138896852 \cdot 10^{-50} \cdot \text{newton} \quad (\text{Classical})$$

Thus electrogravitation may well have a resonant property to its basic construct.

The above equations involving a quantum inductance and capacitance suggest that the action of electrogravitation contains the purely reactive (or very nearly so) angles of + and - 90 degrees in a four quadrant system and that the sine of the angle determines the polarity of the force involved at the action point. It is pointed out here that the action point is at the Compton radius of a particle and that the action-force does not occur except at that radius. Further, the vehicle for the transportation is like a transmission line but a line in imaginary space where the electrogravitational particle (graviton) is in a relativistic sense outside the normal world-lines of normal space. The standard light cone illustrates this where the graviton would be defined as present but elsewhere while normal space has a past and a future with definite coordinate points as to where points in normal space are to be found. Page 74 of *SPECIAL RELATIVITY* by Albert Shadowitz, 1988 by Dover Publications explains the light cone concept in detail for those desiring more information on the light cone concept in special relativity. In that same book the complex rotation diagram on page 23 illustrates the imaginary space concept where;

$$(91) \quad \tau := \frac{i \cdot c \cdot t_C}{2 \cdot \pi} \quad x := \frac{1 \cdot c \cdot t_C}{2 \cdot \pi} \quad y := \frac{1 \cdot c \cdot t_C}{2 \cdot \pi} \quad z := \frac{1 \cdot c \cdot t_C}{2 \cdot \pi}$$

or,

$$(92) \quad s := i \cdot \sqrt{x^2 + y^2 + z^2 + \tau^2} \quad s = 5.461117552678115 \cdot 10^{-13} i \cdot m$$

where s = the invariance interval and;

$$(93) \quad r := \sqrt{x^2 + y^2 + z^2 + \tau^2} \quad r = 5.461117552678115 \cdot 10^{-13} \cdot m$$

is the radius vector of the rotation of the space-time vector.

The connection is now established between a rotation in space by way of the complex rotation diagram and the fourth dimension vector τ above which is intimately connected to imaginary space. Instead of attempting to unify forces through the adoption of a great many additional dimensions, a single line serving as a one dimensional thread through all dimensions forms the connection point to all the forces and that one line or end-on τ point connects all of the normal universe to one point in hyperspace and that point in hyperspace sees the same interval distance to all of normal space and that interval is very small indeed.

The balance between the electric and magnetic atomic force is not perfect and the loss energy that results is the cause of the cooling of the universe and thus there is a price to be paid for the gravitational force action. This gravitational entropy is natural and to be expected. Further it is herein postulated that the so called missing mass effect is simply the accumulation of the mass equivalent of the magnetic vector potential energy that is slowly filling space due to the fact that after each graviton is emitted only some actually ever interact again with other matter and further after reacting with other matter it is simply re-emitted to help stabilize the atomic system. Thus gravity is defined here as generated primarily by the magnetic vector potential acting on the electrical potential of particles at the particle Compton wavelength.

We now move on to the electrogravitational concept presented in terms of the curvature of space being caused by gravity instead of gravity being caused by curved space. Firstly, the magnetic term in the preceding formulas in equation 82a and b can be reduced to mv^2/r which is equal to force. Thus rotational force energy is embodied in the electrogravitational expressions as presented previously. Setting the rotational force equal to the classical gravitational force we obtain,

$$(94) \quad m_1 \times v^2 / r = G \times m_1 \times m_2 / r^2 \quad \text{or,} \quad v^2 = G \times m_2 / r$$

The above equation (94) forms the beginning of chapter three next.

43a

The active constants needed for the presentation of chapter three are again presented below.

1. Gravitational Constant, $G := 6.672590000 \cdot 10^{-11} \cdot \frac{\text{m}^3}{\text{kg} \cdot \text{sec}^2}$
2. Speed of light, $c := 2.997924580000000 \cdot 10^8 \cdot \text{m} \cdot \text{sec}^{-1}$
3. Magnetic permeability, $\mu_0, \mu_0 := 1.256637061000001 \cdot 10^{-6} \cdot \frac{\text{newton}}{\text{amp}^2}$
4. Electric permittivity, $\epsilon_0, \epsilon_0 := 8.854187817000001 \cdot 10^{-12} \cdot \frac{\text{farad}}{\text{m}}$
5. Bohr n1 Velocity, $V_{n1}, V_{n1} := 2.187691415844453 \cdot 10^6 \cdot \frac{\text{m}}{\text{sec}}$
6. Electron charge, $q_0, q_0 := 1.602177330000001 \cdot 10^{-19} \cdot \text{coul}$
7. Electron mass, $m_e, m_e := 9.109389700000001 \cdot 10^{-31} \cdot \text{kg}$
8. Compton Electron radius, $r_c, r_c := 3.861593228000001 \cdot 10^{-13} \cdot \text{m}$
9. Bohr Radius, $r_{n1}, r_{n1} := 5.291772490000000 \cdot 10^{-11} \cdot \text{m}$
10. Fine structure constant, $a, \alpha := 7.297353080000001 \cdot 10^{-03}$
11. Plank constant, $h, h := 6.6260755 \cdot 10^{-34} \cdot \text{joule} \cdot \text{sec}$
12. Compton Electron time, $t_c, t_c := 8.0933010000001 \cdot 10^{-21} \cdot \text{sec}$
13. Quantum electromagnetic frequency, $f_{LM}, f_{LM} := 1.00322480500001 \cdot 10^1 \cdot \text{Hz}$
14. Quantum electric field frequency, $f_h, f_h := 9.016534884 \cdot 10^{17} \cdot \text{Hz}$
15. Quantum acceleration field constant, $A_{em}, A_{em} := 3.007592302 \cdot 10^{09} \cdot \frac{\text{m}}{\text{sec}^2}$
16. Field acceleration frequency constant, $f_a, f_a := 3.520758889 \cdot 10^{10} \cdot \text{Hz}$

43b

17. Free space resistance, R_s , $R_s := \mu_0 \cdot c$ and $1 \cdot \Omega = 1 \cdot \text{kg} \cdot \text{m}^2 \cdot \text{sec}^{-1} \cdot \text{coul}^{-2}$

$$R_s = 376.7303133310863 \cdot \text{ohm}$$

and/or... $R_s := \frac{1}{\epsilon_0 \cdot c}$

$$R_s = 376.730313488167 \cdot \text{ohm}$$

18. Quantum Hall Ohm, R_Q , $R_Q := \frac{h}{q_0^2}$

$$R_Q = 2.58128058743606 \cdot 10^4 \cdot \text{ohm}$$

Additional related constants are included for the discussions past page 21 below.

(SUN MASS)	(SUN rad.)
$m_r := 1.99 \cdot 10^{30} \cdot \text{kg}$	$r_s := 6.96 \cdot 10^8 \cdot \text{m}$
= 1.99 x 10³⁰ kg	= 6.96 x 10⁸ m

$\pi := 3.141592654000001$ $m_p := 1.672623100000001 \cdot 10^{-27} \cdot \text{kg}$

$m_e := 9.109389700000001 \cdot 10^{-31} \cdot \text{kg}$ $l_q := 2.817940920000001 \cdot 10^{-15} \cdot \text{m}$

$m_a := 1.660540200000001 \cdot 10^{-27} \cdot \text{kg} = \text{AMU}$

Note..... ((V_{n1} & V_{LM} are SELECT))

$$V_{n1} := 2.187691415844453 \cdot 10^6 \cdot \text{m} \cdot \text{sec}^{-1}$$

$$V_{LM} := -0.085363289893272 \cdot \text{m} \cdot \text{sec}^{-1}$$

NOTE: $\frac{V_{n1}}{V_{LM}^2} = 3.002228710934959 \cdot 10^8 \cdot \text{m}^{-1} \cdot \text{sec}$ $V_n := \frac{V_{n1}}{\alpha}$

$$\frac{V_n}{c} = 0.999999999587411$$

$\lambda_{\Delta} := 2 \cdot \pi \cdot r_{n1}$ $m_{\Delta} := m_e$ $t_{\Delta} := \frac{h}{m_e \cdot V_{n1}^2}$ $r_x := r_{n1}$

$t_h := \frac{t_c}{\alpha}$ $f_h := \frac{1}{t_h}$ and constants in general that are also used are:

$t := 1 \cdot \text{sec}$ $Q_i := q_0 \cdot t^{-1}$ $L := 1 \cdot \text{m}$

Electrogravitation and The General Theory

Chapter 3

The following formulae will demonstrate how the electrogravitational expressions previously presented in (76, 78, & 79) can be modified by adding an expression that shortens the effective Compton radius by an amount related to the Lorentz transform and the effect of increasing velocity relative to an outside observer. Added to this special theory effect on relative force increase there is lumped in the additional force increase caused by near mass and then the entire effect is classified as a general theory of electrogravitation. Equation (95) below derives the velocity that is a vector rotational velocity from the cancellation of like terms in (94) above.

The Sun mass and radius are used in the following example of the above proposed combined action force result and the equations themselves are iterated so as to demonstrate that if the mass becomes large enough or the relative velocity becomes large enough then the electrogravitational action force becomes chaotic and terms become imaginary. This can also happen if the radius of the action force becomes smaller by a critical amount or the radius of the near-field mass becomes small enough.

Included below the electrogravitational equations are surface plots for the real and imaginary force amplitudes. These plots are then followed by regular x-y plots that reveal the chaotic nature of the individual (t) and (u) sub system component equations of the total electrogravitational equation. Please feel free to experiment by changing the variables such as mass, radius, or the equation forms themselves bearing in mind however that the original equation form should be saved beforehand or the new forms saved under a different filename.

Let the following constants for the purpose of calculation be established:

(SUN MASS)	(SUN rad.)
$m_r := 3.995 \cdot 10^{26} \cdot \text{kg} = 1.99 \times 10^{30}$	$r_s := 6.96 \cdot 10^{08} \cdot \text{m} = 6.96 \times 10^8$

The below equation is given as an example of near-mass related velocity that has a relativistic effect on its own individual electrons.

$$(95) \quad v_{\text{rel}} := \sqrt{\frac{G \cdot m_r}{r_s}} \quad v_{\text{rel}} = 6.188722252437582 \cdot 10^3 \cdot \text{m} \cdot \text{sec}^{-1}$$

Next, plug in the assumed particle velocity in the Sun (Which is likely close to c.)

$$(96) \quad V_n := 2.997924579 \cdot 10^{08} \cdot \text{m} \cdot \text{sec}^{-1} \quad \text{Where,} \quad \frac{V_n}{c} = 0.999999999666436$$

The below equations are the iteration engine from 1 to N.

$$N := 20 \quad t := 0..N$$

$$(97) \quad \begin{bmatrix} V_0 \\ L_0 \\ R_0 \\ B_0 \end{bmatrix} := \begin{bmatrix} \left(\frac{G \cdot m_r}{r_s} \right)^{\frac{1}{2}} \\ 1 \\ r_s \\ m_r \end{bmatrix} \quad \begin{bmatrix} V_{(t+1)} \\ L_{(t+1)} \\ R_{(t+1)} \\ B_{(t+1)} \end{bmatrix} := \begin{bmatrix} \left(\frac{G \cdot B_t}{R_t} \right)^{\frac{1}{2}} \\ \left[1 - \frac{(V_n + V_t)^2}{c^2} \right]^{\frac{1}{2}} \\ L_t \cdot r_s \\ \frac{m_r}{L_t} \end{bmatrix}$$

$$(98) \quad u := 0..N \quad \begin{bmatrix} V_0 \\ L_0 \\ R_0 \\ B_0 \end{bmatrix} := \begin{bmatrix} \left(\frac{G \cdot m_r}{r_s}\right)^{\frac{1}{2}} \\ r_s \\ 1 \\ r_s \\ m_r \end{bmatrix} \quad \begin{bmatrix} V_{(u+1)} \\ L_{(u+1)} \\ R_{(u+1)} \\ B_{(u+1)} \end{bmatrix} := \begin{bmatrix} \left(\frac{G \cdot B_u}{R_u}\right)^{\frac{1}{2}} \\ \left[1 - \frac{(V_n + V_u)^2}{c^2}\right]^{\frac{1}{2}} \\ L_u \cdot r_s \\ \frac{m_r}{L_u} \end{bmatrix}$$

$$r_x := r_{n1} \quad r_n := r_{n1} \quad l_{A1} := l_q \quad r_c := \frac{h}{2 \cdot \pi \cdot m_e \cdot c}$$

$$V_{LM} = -0.085363289893272 \cdot m \cdot \text{sec}^{-1} \quad r_c = 3.861593254172486 \cdot 10^{-13} \cdot m$$

= Compton radius of the electron

(99)

$$x_t := \left[\left[\frac{q_o^2}{4 \cdot \pi \cdot \epsilon_o \cdot r_n \cdot (L_t) \cdot r_c} - \frac{\mu_o \cdot q_o^2}{4 \cdot \pi \cdot l_q \cdot (L_t) \cdot r_c} \cdot V_{n1}^2 \right] - \left[\frac{\mu_o \cdot q_o^2}{4 \cdot \pi \cdot l_{A1} \cdot (L_t) \cdot r_x} \cdot V_{LM}^2 \right] \right]$$

$$x_t := \frac{-1}{4} \cdot q_o^2 \cdot \frac{(-l_q \cdot l_{A1} \cdot r_x + \mu_o \cdot V_{n1}^2 \cdot \epsilon_o \cdot r_n \cdot l_{A1} \cdot r_x + \mu_o \cdot V_{LM}^2 \cdot \epsilon_o \cdot r_n \cdot r_c \cdot l_q)}{[\pi \cdot \epsilon_o \cdot [r_n \cdot [L_t \cdot [r_c \cdot [l_q \cdot (l_{A1} \cdot r_x)]]]]]]]$$

(100)

$$y_u := \left[\left[\frac{q_o^2}{4 \cdot \pi \cdot \epsilon_o \cdot r_n \cdot (L_u) \cdot r_c} - \frac{\mu_o \cdot q_o^2}{4 \cdot \pi \cdot l_q \cdot (L_u) \cdot r_c} \cdot V_{n1}^2 \right] + \left[\frac{\mu_o \cdot q_o^2}{4 \cdot \pi \cdot l_{A1} \cdot (L_u) \cdot r_x} \cdot V_{LM}^2 \right] \right]$$

$$y_u := \frac{-1}{4} \cdot q_o^2 \cdot \frac{(-l_q \cdot l_{A1} \cdot r_x + \mu_o \cdot V_{n1}^2 \cdot \epsilon_o \cdot r_n \cdot l_{A1} \cdot r_x - \mu_o \cdot V_{LM}^2 \cdot \epsilon_o \cdot r_n \cdot r_c \cdot l_q)}{[\pi \cdot \epsilon_o \cdot [r_n \cdot [L_u \cdot [r_c \cdot [l_q \cdot (l_{A1} \cdot r_x)]]]]]]]$$

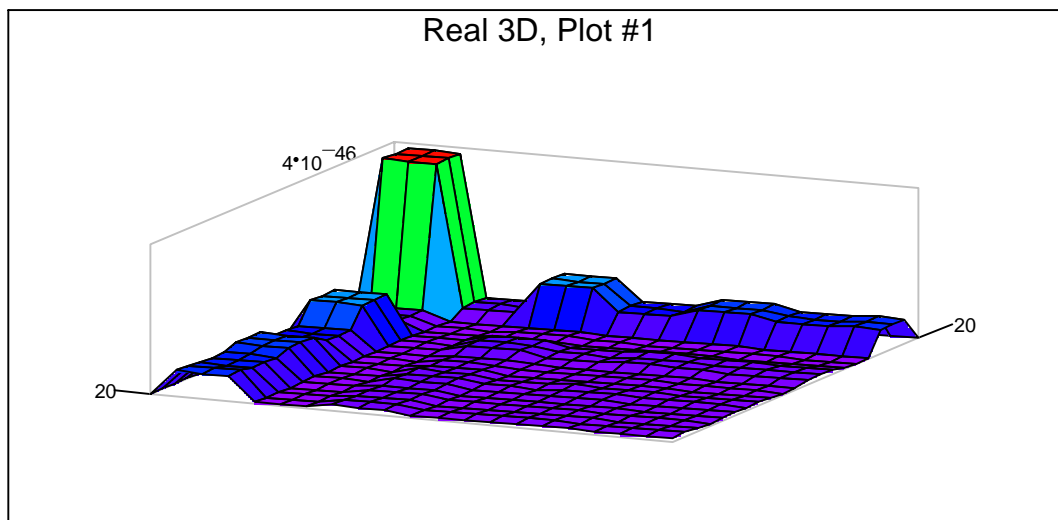
$$(101) \quad F_{(t,u)} := x_t \cdot \mu_o \cdot y_u \quad (\text{Total iterated gravitational force.})$$

The following plots 1 through 4 serve to show that large mass and near light velocities can cause instability in the gravitational force.

Define: $f(x, y) := x \cdot \mu_0 \cdot y$ and, $M_{(t, u)} := f(x_t, y_u)$

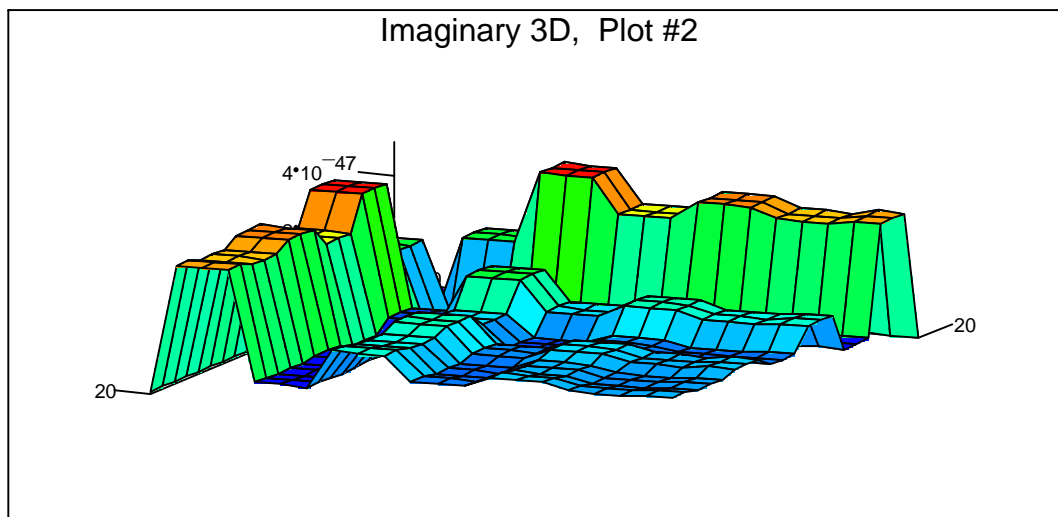
then:

$M_r := \text{Re}(M)$



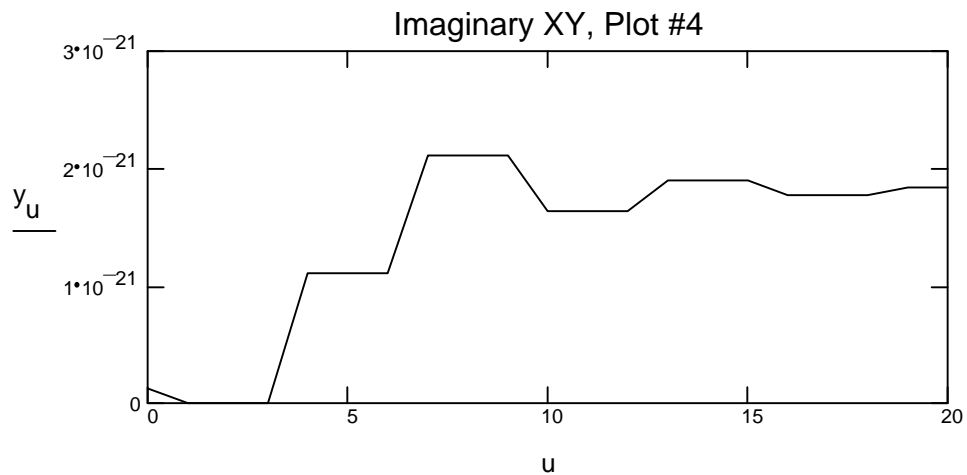
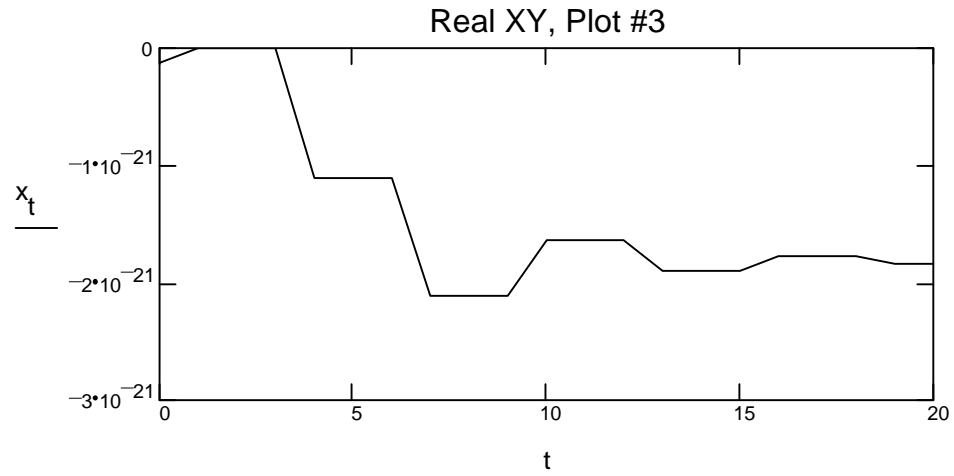
M_r

$M_i := \text{Im}(M)$



M_i

Note that in the below plots 3 & 4 that a zero force can occur.



Notice that in the example above, a mass is chosen that is four orders of magnitude less than the actual Earth mass. Notice also the instability that results through the total iteration. If, however, the actual mass is used in the iteration process, the instability settles rapidly. Therefore I suggest that as our Sun loses mass through radiation, it may become unstable at the mass chosen above which is about 86% of its present mass. It may pulsate or actually ring like a very large bell.

It may be of interest to input V_{rel} in (95) above in the Lorentz transform and apply that to degrees related to rotational motion. This will relate that mass related velocity to the bending of light near the surface of a large mass such as the surface of our Sun.

Let $m_r := 1.99 \cdot 10^{30} \cdot \text{kg}$ Then:

$$(102) \quad v_{rel} := \sqrt{\frac{G \cdot m_r}{r_s}} \quad v_{rel} = 4.367864312158207 \cdot 10^5 \cdot \text{m} \cdot \text{sec}^{-1}$$

and,

$$(103) \quad \gamma' := \left[1 - \left(\frac{v_{rel}}{c} \right)^2 \right]^{\left(\frac{-1}{2} \right)} \quad \text{which is a form of the Lorentz transform in Special Relativity}$$

$$\text{or,} \quad \gamma' = 1.000001061371855$$

$$\gamma'' := 2 \cdot \pi \cdot (\gamma' - 1)$$

$$\gamma'' = 6.668796044712661 \cdot 10^{-6} \cdot \text{rad} \quad \text{equals} \quad 3.820938678 \cdot 10^{-4} \cdot \text{deg}$$

which is equivalent to 0 deg., 0 min., 1.38 sec. of arc since there are 2pi rad. in 360 degrees and is in the range predicted by Einstein's formula below:

where; $\gamma := 1$

$$(104) \quad \theta_E := \frac{(1 + \gamma) \cdot 2 \cdot G \cdot m_r}{c^2 \cdot r_s} \quad \theta_E = 8.490961321074942 \cdot 10^{-6} \cdot \text{rad}$$

or,

$$(105) \quad \theta_E := \frac{4 \cdot v_{rel}^2}{c^2} \quad \theta_{Edeg} := \theta_E \cdot 57.29577951 \cdot \frac{\text{deg}}{\text{rad}}$$

$$\text{or,} \quad \theta_{Edeg} = 4.864962476802483 \cdot 10^{-4} \cdot \text{deg}$$

which is equivalent to 0 deg., 0 min., 1.75 sec. of arc which is the value that has been verified by measurement according to the Encyclopedia Of Modern Physics, page 605 of the General Relativity section, 1989.

The above discussion of the bending of light near the surface of the sun brings out the fact that the units involved are directly related to angular velocity and further that gravitational action on near-field mass has rotational motion or rotating vector forces that impart that motion in the form of an arc to passing particles. It is therefore herein suggested that gravitational forces are born of rotational motion and are thus able to impart that motion to other systems when acting on those systems at the quantum level. Thus the equations (80a) and (80b) are the electrogravitational equivalent of the mv^2/r rotational force.

Since mass was previously defined as the result of a torus shaped arrangement of quantum state magnetic fields in a standing wave rotational action then one possible way to interact or counteract it would be to form standing waves on a conductive surface wherein the entire surface would be covered with continuously linked bubbles of these standing waves where each bubble was phase locked in counter rotation with its neighboring bubble-field neighbor. This would be most efficient on a super conducting surface and a likely frequency would be related to the quantum magnetic frequency f_{LM} as in equation (106) on the next page. First let us establish the quantum electrogravitational radius as:

$$r_{LM} := \frac{h}{2 \cdot \pi \cdot m_e \cdot |V_{LM}|} \quad \text{or,} \quad r_{LM} = 1.356176097373951 \cdot 10^{-3} \cdot m$$

Then the electromagnetic frequency related to the least quantum electrogravitational radius is:

$$(106) \quad f_{\text{atc}} := \left| \frac{c}{2 \cdot \pi \cdot r_{\text{LM}}} \right| \quad \text{or,} \quad f_{\text{atc}} = 3.518234223308455 \cdot 10^{10} \cdot \text{Hz}$$

This frequency is also defined as the quantum acceleration frequency constant as well as the f_{at} frequency of equation (61) previous. Standing waves do not radiate energy and as such they may build to extremely high levels without being dissipated. Therefore they may be able to block completely the electrogravitational energy which of course would have at least two interesting results. The first would be the obvious counter-gravitation and the second would be the building of gravitational energy within the confines of the gravity shield. This energy would arise due to the entropic radiation of the field mass inside the shield that is still able to radiate away gravitons assuming the shield was able to stop them from going out and was able to stop outside ones from going in. This is also assuming that the normal case for gravity allows not only for the absorption of the electrogravitation on the one side of an interacting particle but later on the emission of the same energy on the opposite side in the original direction giving the necessary attraction action that we observe as gravity. However the particle acted on still emits gravitons as a result of the normal gravitational entropic action and therefore not only counter-gravitation is a serious consideration but a way to harness gravitational energy directly might be possible in a properly designed and constructed pondermotive force vehicle. This force field could be directed much like a phased array by suitable magnetic fields behind the skin of a surface conductor that would allow for the direction and

concentration of the repelling forces in the desired direction. This would very likely have to be computer controlled as fast control would be essential for a stable and controllable field action to be possible.

The suggested conclusion from the preceding pages is that gravity is the result of a rotational magnetic vector having a basic frequency f_{LM} and a basic radius related to its quantum wavelength of λ_{LM} . Further, this action is carried by a type of particle that has the geometry of the formulas in (80a and b) and also can impart a reverse pondermotive action force that cannot be shielded against by normal means of shielding such as with a wire cage and the like. The magnetic vector potential is closely related to this action force if not the same. I suggest that not only can anti-gravity be developed but that it very likely already is.

A scheme for the technical workings of a propulsion system for gravitating is now presented by the author with the basics foremost in mind. Variations on the scheme are quite possible.

The author is now asking the reader to visualize a saucer shaped metal covered craft that is mostly hollow with the exception of a centrally located engine that vaporizes a fuel that is ionized totally and the electrons are stored in a ring that contains them by the use of magnetic force and they circulate around a heavily insulated metal rod that is connected to the metal skin of the craft. The protons are jetted out of the craft to allow the surface of the craft to become highly charged and the protons will be skating around the superconducting surface. Next the circulating electrons in the centrally located gravitational wave resonance oscillator will be allowed to jump back and forth by changing the path radius through switching the

intensity of the magnetic field that controls the force that confines the electrons. This will couple the negative pulsating charge field to the surface of the craft through the highly insulated center rod that is connected to the outside conductive skin and the protons will move in sympathetic alternating motion towards and away from the surface of the craft. The magnetic vector potential is in-line to the motion of the charge particle and therefore in-line also with the incoming electrogravitons. The change of distance of the radius of the electron orbit in the gravity oscillator is equal to or multiples of the previously calculated r_{LM} in (85) previous. The rate of pulsation will determine the amount of force and shifting the action center on the surface will determine the translational motion of the craft. The incoming electrogravitation interacts at the Compton wavelength of the proton and not with the electric field of the proton externally. The action is electromagnetic internally in the proton wavelength however.

There is now hypothesized a line of matter-wave action that can be drawn from the protons to the electrons at the center of the craft and any matter that existed in between would be influenced by those matter-wave action lines. I propose that the in-between matter becomes phase locked between the two oscillating fields and therefore becomes immobilized in direct proportion to the strength of the crafts pondermotive fields. Thus the craft could make abrupt changes in velocity and the cargo or passengers would be atomically restrained and thus feel no stress at all. The material to be vaporized for ionization purposes should have as heavy a proton count as possible for the highest plant efficiency and preferably not naturally radioactive. The skin of the craft should be superconductive if possible.

I have seen craft that convinced me that something along the lines of what is herein described as a possible construct is a very elegant and efficient way to mote indeed. I would be very happy in the endeavor of actually constructing one if allowed the possibility. With what has been presented in this paper and the new materials and technology that is emerging in high temperature superconductivity, I feel that the possibility that we can construct such a craft is very close to becoming a reality.

The next chapter expands on the concept of a least quantum energy being available at the r_{n1} level of Hydrogen. The concept is not limited to the atomic level but is applicable to the elementary particles such as the electron and proton also.

From that concept, it is then suggested that energy may be extracted from matter by properly phasing a stimulus of coherent electromagnetic energy to cause the system to either release more energy or take in more energy. All of this as a result of the centripetal force being slightly greater than the coulomb and magnetic forces respectively. The difference is the electrogravitational force.

Electrogravitational Dynamics

Chapter 4

The below constants are stated for the equations that are in the following chapter.

$$\mu_o := 1.256637061 \cdot 10^{-6} \cdot \frac{\text{newton}}{\text{amp}^2}$$

$$q_o := 1.602177330 \cdot 10^{-19} \cdot \text{coul}$$

$$V_{LM} := .08542454612 \cdot \text{m} \cdot \text{sec}^{-1}$$

$$t_{LM} := 9.967855609 \cdot 10^{-2} \cdot \text{sec}$$

$$l_q := 2.817940920 \cdot 10^{-15} \cdot \text{m}$$

$$m_e := \frac{\mu_o \cdot q_o^2}{4 \cdot \pi \cdot l_q}$$

$$r_{n1} := 5.291772490 \cdot 10^{-11} \cdot \text{m}$$

$$l_{LM} := q_o \cdot t_{LM}^{-1}$$

$$\lambda_{LM} := V_{LM} \cdot t_{LM}$$

$$G := 6.672590000 \cdot 10^{-11} \cdot \text{m}^3 \cdot \text{kg}^{-1} \cdot \text{sec}^{-2}$$

$$Fg_{\text{classic}} := G \cdot \frac{m_e^2}{r_{n1}^2} \quad \text{or,} \quad Fg_{\text{classic}} = 1.977291383868968 \cdot 10^{-50} \cdot \text{newton}$$

For the centripetal force expression, where the fine structure constant times the free space velocity of light will yield the Bohr n1 orbital velocity;

$$\alpha := 7.297353080 \cdot 10^{-3} \quad c := 2.99792458 \cdot 10^{08} \cdot \frac{\text{m}}{\text{sec}} \quad V_{n1} := \alpha \cdot c$$

$$V_{n1} = 2.187691416747071 \cdot 10^6 \cdot \text{m} \cdot \text{sec}^{-1} \quad = \text{standard value.}$$

$$\text{Also let: } \theta := \frac{\pi}{2} \quad \text{and,} \quad \epsilon_o := 8.854187817 \cdot 10^{-12} \cdot \frac{\text{farad}}{\text{m}}$$

Let the three forces centripetal 1 & 2, magnetic, and coulomb be defined as:

(107)

$$F_{1cent} := \frac{\mu_o}{4 \cdot \pi} \cdot \frac{q_o^2}{l_q \cdot r_{n1}} \cdot (V_{n1}) \cdot V_{LM} \quad F_{1cent} = 3.217042954200647 \cdot 10^{-15} \cdot \text{newton}$$

(108)

$$F_{1cn} := \frac{\mu_o}{4 \cdot \pi} \cdot \frac{q_o^2}{l_q \cdot r_{n1}} \cdot V_{n1}^2 \quad F_{1cn} = 8.238729472820284 \cdot 10^{-8} \cdot \text{newton}$$

(109)

$$F_{1mag} := \frac{\mu_o}{4 \cdot \pi} \cdot \frac{q_o^2}{l_q \cdot r_{n1}} \cdot (V_{n1} - V_{LM}) \cdot V_{LM} \quad (\text{Vectored with centripetal force.})$$

$$F_{1mag} = 3.217042828582184 \cdot 10^{-15} \cdot \text{newton}$$

(110)

$$F_{1coul} := \frac{1}{4 \cdot \pi \cdot \epsilon_o} \cdot \frac{q_o^2}{r_{n1}^2} \quad \text{or:} \quad F_{1coul} = 8.238729466021871 \cdot 10^{-8} \cdot \text{newton}$$

Therefore, the magnetic force at r_{n1} for system 1 is given as;

(111)

$$F_{1sys} := (\cos(\theta)) \cdot (F_{1cn} - F_{1coul}) + i \cdot \sin(\theta) \cdot (F_{1cent} - F_{1mag})$$

or,

$$F_{1sys} = 4.162690177641084 \cdot 10^{-33} + 1.25618463377314 \cdot 10^{-22} i \cdot \text{newton}$$

Assuming a second identical system below, F_{2sys} is defined as;

$$F_{2cn} := F_{1cn} \quad F_{2cent} := F_{1cent} \quad F_{2mag} := F_{1mag} \quad F_{2coul} := F_{1coul}$$

Then the magnetic force for system 2 is given by equation 112 on the next page as;

(112)

$$F2_{\text{sys}} := \cos(\theta) \cdot (F2_{\text{cn}} - F2_{\text{coul}}) + i \cdot \sin(\theta) \cdot (F2_{\text{cent}} - F2_{\text{mag}})$$

or,

$$F2_{\text{sys}} = 4.162690177641084 \cdot 10^{-33} + 1.25618463377314 \cdot 10^{-22} i \cdot \text{newton}$$

There will be two components to the centripetal force, one of which is normal and balances the coulomb electric force and the other will be a vectored action (as above) with the magnetic force so that the resultant sum of differences is complex. The total electrogravitational force expression is shown below.

$$(113) \quad F_{\text{tot}} := F1_{\text{sys}} \cdot \mu_0 \cdot F2_{\text{sys}}$$

or for the total system complex expression;

$$F_{\text{tot}} = -1.982973073816794 \cdot 10^{-50} + 1.314218040083849 \cdot 10^{-60} i \cdot \text{m}^{-1} \cdot \text{henry} \cdot \text{newton}^2$$

The above serves to illustrate that due to the complex number nature of each force system expression the resulting total electrogravitational force is negative (one of attraction) by the accepted definition of force. This is by reason of the (i) squared term being equal to (-1). The +(i) term on the right occurs as a result of Mathcad not resolving the cosine of 90 deg. with enough precision to yield exactly zero.

The difference of the magnetic and centripetal forces in one system should then yield a constant force at 90 degrees reactive and that force should be very nearly equal to the expected electrogravitational force for that system.

Thus the total local one-system force (electrogravitational) is the interplay sum of the double component centripetal force which tends to be balanced against the nearly equal but lesser coulomb and magnetic forces respectively. The resultant difference of the forces interplayed will yield the electrogravitational force graviton

that will react with another like system to produce the total electrogravitational action-reaction force.

It follows that the number of minor systems expressed as the ratio of the total mass of the composite local system to the mass of an electron will yield a pure number that will yield the total one-system force that can be multiplied by the permeability of free space and another macroscopic system to yield the total electrogravitational force.

Therefore, let the following be established:

$$\text{Mass1} := m_e \quad \text{Mass2} := m_e \quad \text{Ratio1} := \text{Mass1} \cdot m_e^{-1} \quad \text{Ratio2} := \text{Mass2} \cdot m_e^{-1}$$

At r_{n1} ;

$$(114) \quad F_{\text{total}} := ((\text{Ratio1}) \cdot F_{1\text{sys}}) \cdot \mu_0 \cdot ((\text{Ratio2}) \cdot F_{2\text{sys}})$$

or,

$$F_{\text{total}} = -1.982973073816794 \cdot 10^{-50} + 1.314218040083849 \cdot 10^{-60} i \cdot \text{m}^{-1} \cdot \text{henry} \cdot \text{newton}^2$$

Now let the equations be solved for a velocity that will yield the proper value of force for one system at the Bohr radius. The following solution assumes the most primary case where all angles = 90 degrees. (It is the case is for the centripetal force F_{cn} nearly balancing the magnetic force where the magnetic force related velocity is slightly different enough to generate the required electrogravitational *one* system force F_{total} above.) The solution will term $F_{1\text{sys}}$ (simplified) as F_{m1} .

For that purpose let the following constants be established:

$$h := 6.6260755 \cdot 10^{-34} \cdot \text{joule} \cdot \text{sec} \quad m_e = 9.109389688253175 \cdot 10^{-31} \cdot \text{kg}$$

$$r_c := \frac{h}{2 \cdot \pi \cdot m_e \cdot c} \quad r_c = 3.861593259656345 \cdot 10^{-13} \cdot \text{m}$$

(115)

$$F_{m1} := \frac{\mu_o \cdot (q_o^2) \cdot V_{LM}^2}{4 \cdot \pi \cdot l_q \cdot r_{n1}} \quad \text{or,} \quad F_{m1} = 1.256184634210259 \cdot 10^{-22} \cdot \text{newton}$$

The result for F_{m1} above squared times μ_o will yield the gravitational force.

$$(116) \quad F_{1g} := F_{m1}^2 \cdot \mu_o$$

$$\text{or,} \quad F_{1g} = 1.982973075196837 \cdot 10^{-50} \cdot \text{m}^{-1} \cdot \text{henry} \cdot \text{newton}^2$$

Compare this with the classical expression remembering that only the $1 / r_{n1}$ terms are variable.

$$(117) \quad F_{g \text{ classic}} := \frac{G \cdot m_e^2}{r_{n1}^2} \quad F_{g \text{ classic}} = 1.977291383868968 \cdot 10^{-50} \cdot \text{newton}$$

Finally, the V_{nx} variable is solved for that would yield the proper value for the electrogravitational force as outlined above;

$$\text{where,} \quad V_{n1} = 2.187691416747071 \cdot 10^6 \cdot \text{m} \cdot \text{sec}^{-1}$$

$$\text{and,} \quad V_{nx} := V_{n1} - V_{LM}$$

$$\text{or:} \quad V_{nx} = 2.187691331322525 \cdot 10^6 \cdot \text{m} \cdot \text{sec}^{-1}$$

$$\text{compare to:} \quad V_{n1} = 2.187691416747071 \cdot 10^6 \cdot \text{m} \cdot \text{sec}^{-1}$$

$$\text{where:} \quad V_{n1} - V_{nx} = 0.085424546152353 \cdot \text{m} \cdot \text{sec}^{-1} \quad \text{difference. (Check)}$$

therefore,

$$(118) \quad F'_{m1} := \frac{\mu_o}{4 \cdot \pi} \cdot \left[\frac{q_o^2}{l_q \cdot r_{n1}} \cdot (V_{n1} - V_{nx})^2 \right]$$

$$\text{or;} \quad F'_{m1} = 1.256184635161782 \cdot 10^{-22} \cdot \text{newton}$$

$$\text{comparing } F_{m1} \text{ to } F'_{m1} \text{ above;} \quad F_{m1} = 1.256184634210259 \cdot 10^{-22} \cdot \text{newton}$$

The above solutions for F'_{m1} assumes that the normal V_{n1} velocity is used for the centripetal force while V_{LM} is used in the magnetic force equation.

The system mechanics above for the $n1$ orbital illustrate that a velocity just slightly below the V_{n1} velocity ($= V_{nx}$) will create a differential velocity V_{LM} that will generate the electrogravitational force. In contrast it may be noted that the differential of the kinetic energy in each orbital in an atom will be found by taking the electron mass times the lower velocity squared and then subtracting that from the electron mass times the velocity squared of the higher velocity orbital.

or; the Bohr energy differential $n1-n2$ is;

$$\text{Let: } V_{n2} := \frac{V_{n1}}{2} \quad \text{and} \quad (119) \quad E_{nx} := \left(\frac{\mu_o \cdot q_o^2}{4 \cdot \pi \cdot l_q} \right) \cdot (V_{n1}^2 - V_{n2}^2)$$

and thus; or, $E_{nx} = 3.269811148261693 \cdot 10^{-18} \cdot \text{joule}$

$$(120) \quad \text{freq}_{\text{rad}} := \frac{E_{nx}}{h} \quad \text{or} \quad \text{freq}_{\text{rad}} = 4.934762889830781 \cdot 10^{15} \cdot \text{Hz}$$

The case for generation of the electrograviton however does not depend on the orbital energy difference but on the very slight difference between the expected normal velocity V_{n1} and the slightly lower actual velocity of V_{nx} in the same orbital. This lower velocity would cause the electron to precess in an attempt to close the required distance λ_n and also the orbital would have just the slightest amount of lesser energy that the expected normal energy level. We may call this a negative energy that when added to the normal quantum energy level will produce the energy level that requires orbital precession as well as just a very slightly greater energy to

raise an electron to a higher energy level than might be predicted by the normal math. This negative energy may also yield an action mechanism that would increase the entropy of the atomic system and in fact all atomic systems.

This could be extended to any system even into the nuclear realm of quarks and gluons. Any such energy deprived system would have reverse interaction momentum since the energy interaction involves a negative energy mechanism. That further, the very slight negative energy in the orbital is likened to a negative energy particle that has a quantum radius equal to r_{LM} and thus extends far away from the atom. The basic electrogravitational mechanism is embodied in the very slight momentum differential that yields V_{nx} which suggests that the second law of thermodynamics applies even in a quantum sense to what would otherwise be considered a stable atomic orbit. It suggests that even the proton and electron are slowly yielding to the requirement that they also must give up their stability in the form of gravitational energy derived from the very slight energy loss that causes and promotes the electrogravitational force. Thus *gravity* is the result of entropy. Entropy that converts stability to less stability and less of a well defined energy. All matter would thus be affected in a like manner. Electrogravitation is one of the final results.

Again, the electrogravitational force is derived from the slight difference between the expected orbital velocity and the slightly lower actual velocity which is expressed below as;

$$(121) \quad V_{LM} := (V_{n1} - V_{nx}) \quad \text{or}; \quad V_{LM} = 0.085424546152353 \cdot m \cdot \text{sec}^{-1}$$

Note that it is apparent that the V_{LM} velocity is directly related to a differential in

momentum within one orbital while the differential in V_n orbital jump velocity is most closely related to energy differential as far as normal radiation of form-loss is considered. The quantum frequency related to the momentum differential is:

$$(122) \quad E_{LM} := \frac{\mu_o \cdot q_o^2}{4 \cdot \pi \cdot l_q} \cdot V_{LM}^2 \quad \text{or,} \quad E_{LM} = 6.647443294709804 \cdot 10^{-33} \cdot \text{joule}$$

and,

$$(123) \quad f_{LM} := \frac{E_{LM}}{h} \quad \text{or,} \quad f_{LM} = 10.03224803989904 \cdot \text{Hz}$$

which of course is the fundamental electrogravitational interaction momentum differential related frequency as posited previously. Also please note that the expression for mass is given above as:

$$(124) \quad m_e := \frac{\mu_o \cdot q_o^2}{4 \cdot \pi \cdot l_q} \quad \text{where} \quad m_e = 9.109389688253175 \cdot 10^{-31} \cdot \text{kg}$$

Which is the mass of the electron to a very exact and extreme precision. Note then that the expression defines the electron mass as the product of charge squared and the magnetic permeability of free space divided by 4 times π and the classical radius of the electron. It is postulated here that the classic electron radius is directly connected to all other electrons throughout the universe by that same distance in hyperspace where all distances become the same distance and further that all same type particles share this feature of a unique same distance to each other through that hyperspace which is a connection path realm connected to all space. The momentum differential result of the orbital velocity is expressed in (125) next.

(62)

$$(125) \quad \text{momentum} \quad P_{LM} := \frac{\mu_0 \cdot q_0^2}{4 \cdot \pi \cdot l_q} \cdot (V_{n1} - V_{nx})$$

$$\text{or,} \quad P_{LM} = 7.781654798439545 \cdot 10^{-32} \cdot \text{kg} \cdot \text{m} \cdot \text{sec}^{-1}$$

and,

$$(126) \quad \lambda_{LM} := \frac{h}{P_{LM}} \quad \text{or,} \quad \lambda_{LM} = 8.514995424017943 \cdot 10^{-3} \cdot \text{m}$$

which is then capable of reaching out much further than the atomic orbitals that generate that wavelength. This is also the fundamental electrogravitational wavelength that is of interest when designing superconducting interaction surfaces that would either absorb or radiate gravitational energy in the most controllable and efficient manner.

On a large scale the entropy associated with the electrogravitational mechanism would cause a energy loss to all electromagnetic phenomena and when considering interactions to the radiation on a line normal or perpendicular to the direction of propagation on a local scale the action inline to the propagation would cause an apparent upshift when viewed head on in the gravitational field locally and a downshift when viewed from behind, if that were possible. However, on the overall large scale, the energy would be less when it was observed on the local scale and therefore could erroneously be taken as redshift due to the universe expanding and then be given a constant of expansion velocity proportional to distance, in this case called the Hubbell constant. It therefore is postulated herein that the universe may not be expanding as the data is being interpreted but simply cooling off due to entropy acting on all energy to cause all radiated energy to be at a slightly less energy level

per unit time than our math would predict and the difference is so small per unit energy that on a local scale and small time interval of measurement Hubbell redshift is not taken for what it really is. It is further postulated that this energy loss accumulates as a converted energy to matter material that can be termed *cold dark matter*, a term coined in the recent past by scientists for unseen matter that could explain a very large gravitational attraction in spiral galaxies that is much greater than can be accounted for by the calculated and/or observed matter density of the space region in question. The conservation of energy/mass must be conserved so the energy/mass converted from radiation/matter by entropy leading to the electrogravitational action mechanism is therefore postulated to be converted to a mass-field that has the form of the equation below.

$$(127) \quad m_{\text{field}} := \frac{\mu_0}{4 \cdot \pi} \cdot \left(\frac{q_0^2}{r_c} \right) \quad m_{\text{field}} = 6.647443226850642 \cdot 10^{-33} \cdot \text{kg}$$

where the above mass-field is simply the mass of the electron multiplied by the fine structure constant and applies equally well to the proton or any case where the field around a quantum mass at a quantum distance may be derived.

or;

$$(128) \quad m'_{\text{field}} := \alpha \cdot \left(\frac{\mu_0}{4 \cdot \pi} \right) \cdot \left(\frac{q_0^2}{l_q} \right) \quad m'_{\text{field}} = 6.647443289849455 \cdot 10^{-33} \cdot \text{kg}$$

The quantum coulomb electric field energy at the near surface of the electron is derived by taking the mass-energy of the electron times the fine structure constant squared which is similar to the above process for finding the mass-field above.

$$(129) \quad E_{\text{field}} := \alpha \cdot \left[\left(\frac{\mu_0}{4 \cdot \pi} \right) \cdot \left(\frac{q_0^2}{l_q} \right) \cdot c^2 \right] \quad \text{or,} \quad E_{\text{field}} = 5.974424082111506 \cdot 10^{-16} \cdot \text{joule}$$

And;

$$(130) \quad E'_{\text{field}} := \frac{1}{4 \cdot \pi \cdot \epsilon_0} \cdot \left(\frac{q_0^2}{r_c} \right) \quad \text{or,} \quad E'_{\text{field}} = 5.97442402798209 \cdot 10^{-16} \cdot \text{joule}$$

Thus the quantum electric coulomb field energy divided by the velocity of light in free space squared will yield the quantum magnetic field energy where the electric field energy is derived from the mass-energy times the fine structure constant in the first case and the magnetic field energy is derived from the product of the mass times the fine structure constant in the second case. Ergo; mass is the case for locked-in field energy in the form of a standing wave and the mass of the electron is the least quantum energy state that has a prime number in frequency not divisible by any other number except one. That guarantees a stable state. The same can be said of the proton but it may not be quite as stable as the electron. It may decay due to the fact that its prime is not as prime as the electron in relation to long periods of time. The case for the other particles in the particle realm suggests that they all may be more unstable in time by a factor related directly to the size of their prime divided by their Compton frequency.

The macroscopic form for the electrogravitational expression may be stated where mass total for each system may be expressed as a multiple of the quantum mass of the electron in a simplified form below. This will be stated for a one kilogram mass on the surface of the Earth at mean sea level.

First, let the following constants be stated:

$$\begin{aligned}
 m1_{\text{total}} &:= 1 \cdot \text{kg} & m2_{\text{total}} &:= 5.98 \cdot 10^{24} \cdot \text{kg} & r_x &:= 6.37 \cdot 10^6 \cdot \text{m} \\
 n1 &:= \frac{m1_{\text{total}}}{m_e} & n2 &:= \frac{m2_{\text{total}}}{m_e} & \text{Acc}_{\text{earth}} &:= 9.80665 \cdot \text{m} \cdot \text{sec}^{-2} \\
 n1 &= 1.097768384296403 \cdot 10^{30} & n2 &= 6.564654938092488 \cdot 10^{54} & & \text{(Pure ratios)}
 \end{aligned}$$

then, (where the only variable concerning distance of system separation is r_x):

(131)

$$Fg := \left[n1 \cdot \left[\frac{\mu_o \cdot q_o^2}{4 \cdot \pi \cdot l_q \cdot r_x} \cdot \left[(V_{n1} - V_{nx})^2 \right] \right] \right] \cdot \mu_o \cdot \left[n2 \cdot \left[\frac{\mu_o \cdot q_o^2}{4 \cdot \pi \cdot l_q \cdot r_x} \cdot \left[(V_{n1} - V_{nx})^2 \right] \right] \right]$$

or, $Fg = 9.861952438899696 \cdot \text{m}^{-1} \cdot \text{henry} \cdot \text{newton} \cdot (\text{newton})$

and;

(132) $Fg' := m1_{\text{total}} \cdot \text{Acc}_{\text{earth}}$ or, $Fg' = 9.806649999999999 \cdot \text{newton}$ (classical)

and compare this with the standard or classical gravitational expression below.

(133) $Fg'_{\text{classic}} := \frac{G \cdot (m1_{\text{total}} \cdot m2_{\text{total}})}{r_x^2}$

or, $Fg'_{\text{classic}} = 9.833695575561464 \cdot \text{newton}$

The units show that for the electrogravitational form, only one Newton expression is variable and depends on the $1/r_x$ squared term which insures that the mechanics for changing distance between systems are equal.

The above macroscopic electrogravitational expression is rather straightforward owing to the fact that the electron mass has been shown to be identical to the quantum magnetic field mass-energy at the classical electron radius. They can be

taken to be the same quantum pea in a quantum pod.

$$(134) \quad m_e = \frac{\mu_o \cdot q_o^2}{4 \cdot \pi \cdot l_q} \quad \text{where,} \quad \frac{m_e}{\frac{\mu_o \cdot q_o^2}{4 \cdot \pi \cdot l_q}} = 1$$

Let us now return to the case for the n1 orbital where we can expand on the total orbital system mechanics that may yield the total electrogravitational expression in terms of the centripetal, magnetic, and electrostatic forces all combining to provide the total electrogravitational force.

$$\text{Let } \theta := \frac{\pi}{2} \quad \phi := \frac{\pi}{2} \quad \text{orbital \# } n := 1$$

Demonstrating the simplified form of the electrogravitational atomic n1 action below;

$$(135) \quad F_{M1} := (\sin(\theta) \cdot \sin(\phi)) \cdot \left[\left(\frac{\mu_o \cdot q_o^2}{4 \cdot \pi \cdot l_q \cdot r_{n1}} \right) \cdot \left(\frac{V_{n1}}{n} - V_{LM} \right) \right] \cdot V_{LM}$$

$$\text{or,} \quad F_{M1} = 3.217042829800592 \cdot 10^{-15} \cdot \text{newton}$$

$$(136) \quad F_{C1} := \frac{\mu_o \cdot q_o^2}{4 \cdot \pi \cdot l_q \cdot r_{n1}} \cdot \left(\frac{V_{n1}}{n} \right) \cdot V_{LM}$$

$$\text{or,} \quad F_{C1} = 3.217042955419055 \cdot 10^{-15} \cdot \text{newton}$$

$$(137) \quad F1_{tot} := i \cdot (F_{C1} - F_{M1})$$

$$\text{or,} \quad F1_{tot} = 1.25618463377314 \cdot 10^{-22} i \cdot \text{newton}$$

Check:

$$(138) \quad F_{1 \text{ tot}} \cdot \mu_0 = -1.982973073816794 \cdot 10^{-50} \cdot \text{m}^{-1} \cdot \text{henry} \cdot \text{newton}^2$$

$$\text{and,} \quad F_{g \text{ classic}} = 1.977291383868968 \cdot 10^{-50} \cdot \text{kg} \cdot \text{m} \cdot \text{sec}^{-2}$$

where the classic force is assumed to be negative since the force is one of attraction. In $F_{1 \text{ tot}}$ no assumption need be made as the sign is correct.

$$\text{And note that;} \quad (V_{n1} \cdot V_{LM} - V_{nx} \cdot V_{LM}) = 7.297353091416881 \cdot 10^{-3} \cdot \text{m}^2 \cdot \text{sec}^{-2}$$

which is the fine structure constant times one meter-squared per second-squared.

The force differential between the centripetal and magnetic forces has also an energy differential to be examined for the two related quantum electrogravitational standing wave frequencies that when taken as a differential will yield the basic quantum electrogravitational frequency f_{LM} .

or,

$$(139) \quad F_{M1} \cdot r_{n1} = 1.702385874589052 \cdot 10^{-25} \cdot \text{joule}$$

$$(140) \quad F_{C1} \cdot r_{n1} = 1.702385941063485 \cdot 10^{-25} \cdot \text{joule}$$

And;

$$(141) \quad f_{M1rn1} := \frac{F_{M1} \cdot r_{n1}}{h} \quad f_{M1rn1} = 2.569221969458471 \cdot 10^8 \cdot \text{Hz}$$

$$(142) \quad f_{C1rn1} := \frac{F_{C1} \cdot r_{n1}}{h} \quad f_{C1rn1} = 2.569222069780951 \cdot 10^8 \cdot \text{Hz}$$

the differential freq. is;

$$(143) \quad f_{\text{diff}} := f_{C1rn1} - f_{M1rn1} \quad \text{or,} \quad f_{\text{diff}} = 10.03224802017212 \cdot \text{Hz}$$

This is the quantum electrogravitational frequency that is a result of the frequency difference in the quantum frequency structure of atomic matter of all forms. It is to be expected to be found in all matter-energy signatures and is displayed at very low order magnitude.

The related electromagnetic wavelength differential is;

$$(144) \quad \lambda_{\text{diff}} := c \cdot \left(\frac{1}{f_{M1rn1}} - \frac{1}{f_{C1rn1}} \right) \quad \lambda_{\text{diff}} = 4.556335470344859 \cdot 10^{-8} \cdot \text{m}$$

and;

$$(145) \quad f_{\text{diff}} := \frac{c}{\lambda_{\text{diff}}} \quad \text{or,} \quad f_{\text{diff}} = 6.579683606512612 \cdot 10^{15} \cdot \text{Hz}$$

where also the equivalent frequency in the n1 orbital is;

$$(146) \quad \frac{m_e \cdot \left(\frac{V_{n1}}{n} \right)^2}{h} = 6.579683853107708 \cdot 10^{15} \cdot \text{Hz}$$

The two frequencies above, f_{C1rn1} and f_{M1rn1} , may be taken to be integrally related to the generation of the electrograviton in the case above and the differential between the two represented as a flipping from one to the other forming an energy pump that is supplied by a source directly related to the energy that keeps the electron pulsing from hyperspace as has been postulated in the previous chapters. The energy "radiated" carries negative momentum to everything that it interacts with.

Since the two standing wave frequencies above are considered as a primary step to the formation of the graviton then it may be also inferred that they play a direct role in the receptor interaction with the incoming electrograviton. Therefore if the two frequencies are interfered with by a strong enough electromagnetic wave (at the just

the right wavelength) the process can be made either stronger in the attractive action or made to oppose or reverse the momentum action altogether. The average of the sum of the two frequencies is calculated below.

$$(147) \quad f_{CMavg} := \frac{f_{C1rn1} + f_{M1rn1}}{2} \quad \text{or; } f_{CMavg} = 2.569222019619711 \cdot 10^8 \cdot \text{Hz}$$

and the average electromagnetic wavelength is:

$$(148) \quad \lambda_{CMavg} := \frac{c}{f_{CMavg}} \quad \text{or, } \lambda_{CMavg} = 1.166860846243154 \cdot \text{m}$$

and the diameter related to that wavelength is:

$$(149) \quad D_{\lambda_{CM}} := \frac{\lambda_{CMavg}}{\pi} \quad \text{or, } D_{\lambda_{CM}} = 0.37142334315998 \cdot \text{m}$$

where also; $D_{\lambda_{CM}} = 14.62296626614094 \cdot \text{in}$

Change the orbital # n back on page eight to see how the average frequency will change but the frequency differential remains the same. The wavelength differential will grow larger as an integer increase of orbital # n will demonstrate. This suggests that a particular atomic orbital could be selected for probing by the appropriate frequency that would force the quantum energy level into only one level instead of alternating between the higher and lower energy level that defines the energy difference that generates the quantum electrogravitational frequency f_{LM} . The lower energy level would act as a gravitational energy vacuum as long as it was in that energy level and if the higher energy level were forced to exist by changing the probe input frequency accordingly, the orbital would act as a gravitational generator. By changing the phase of the probe, the polarity of either energy case could be changed

at will. Making the process coherent by using a well organized atomic target, the effect could be focused and magnified.

It is postulated that since a charge may build a non terminated field indefinitely and an atom containing charges can replenish energy lost through the matter wave radiation at a given rate as long as it is within the differential limits set above. Energy would thus flow from hyperspace instead of out and then back. A photon has not the same ability to replenish its energy lost to negative matter wave interaction since it does not build an external field like an electron or proton does. Therefore photons in space over a period of time lose energy and redshift as a result while atomic matter is much more stable.

It is possible to expand the Ftot equation (113) using the formulae (107-112) and (131-132) to yield a formula that combines features of both quantum expressions so that an equation will be arrived at that will apply to macroscopic world size parameters and still retain the quantum expression constants.

First, let us insert the expressions for input variables from page seven previous as primed variables where a 1 kg mass is assumed at the surface of the Earth;

$$\begin{aligned}
 m1'_{total} &:= 1 \cdot \text{kg} & m2'_{total} &:= 5.98 \cdot 10^{24} \cdot \text{kg} & r'_x &:= 6.37 \cdot 10^6 \cdot \text{m} \\
 n1' &:= \frac{m1'_{total}}{m_e} & n2' &:= \frac{m2'_{total}}{m_e} & \text{Acc}_{earth} &:= 9.80665 \cdot \text{m} \cdot \text{sec}^{-2} \\
 n1' &= 1.097768384296403 \cdot 10^{30} & n2' &= 6.564654938092488 \cdot 10^{54} & & \text{(Pure ratios)}
 \end{aligned}$$

Next the (107-110) quantum force expressions are repeated below:

$$\begin{aligned}
 F_{cent} &:= \frac{\mu_o \cdot q_o^2}{4 \cdot \pi \cdot l_q \cdot r'_x} \cdot (V_{n1}) \cdot V_{LM} & F_{cn} &:= \frac{\mu_o \cdot q_o^2}{4 \cdot \pi \cdot l_q \cdot r'_x} \cdot V_{n1}^2 \\
 F_{cent} &= 2.672505401983493 \cdot 10^{-32} \cdot \text{newton} & F_{cn} &= 6.844188693378739 \cdot 10^{-25} \cdot \text{newton}
 \end{aligned}$$

$$F_{\text{mag}} := \frac{\mu_0}{4 \cdot \pi} \cdot \frac{q_0^2}{|q \cdot r'_x|} \cdot (V_{n1} - V_{LM}) \cdot V_{LM} \quad (\text{Vectored with centripetal force.})$$

$$F_{\text{mag}} = 2.672505297628025 \cdot 10^{-32} \cdot \text{newton}$$

$$F_{\text{coul}} := \frac{1}{4 \cdot \pi \cdot \epsilon_0} \cdot \frac{q_0^2}{r'_x{}^2}$$

$$F_{\text{coul}} = 5.685696925291126 \cdot 10^{-42} \cdot \text{newton}$$

Then F_{gtot} is stated as;

(150)

$$F_{\text{gtot}} := \mu_0 \cdot n1' \cdot n2' \cdot ((\cos(\theta) \cdot (F_{\text{cn}} - F_{\text{coul}})) + i \cdot \sin(\theta) \cdot (F_{\text{cent}} - F_{\text{mag}}))^2$$

or;

$$F_{\text{gtot}} = -9.846048356804058 + 0.792074767145431i \cdot \text{m}^{-1} \cdot \text{henry} \cdot \text{newton}^2$$

It can be shown that for an interaction distance less than the Bohr radius r_{n1} the electrogravitational force reverses sign and begins to grow in magnitude as a force of repulsion. This has a very interesting consequence since it means that the collapse of matter would have a limit and while "black holes" may still be possible, they would not collapse indefinitely to a zero diameter.

Let us assemble the variables for input again but this time assign a range variable to r_x around the r_{n1} diameter and also set the interaction masses to paired electrons.

$$m1'_{\text{total}} := m_e \quad m2'_{\text{total}} := m_e \quad r_{\text{var}} := 1 \cdot 10^{-12} \cdot \text{m}, 1.1 \cdot 10^{-12} \cdot \text{m} .. 1 \cdot 10^{-11} \cdot \text{m}$$

$$n1' := \frac{m1'_{\text{total}}}{m_e} \quad n2' := \frac{m2'_{\text{total}}}{m_e} \quad \text{Acc}_{\text{earth}} := 9.80665 \cdot \text{m} \cdot \text{sec}^{-2}$$

$$n1' = 1 \quad n2' = 1 \quad (\text{Pure ratios})$$

Next, the formulae (107-110) involving the quantum force expressions;

$$F_{cent}(r_{var}) := \frac{\mu_o}{4 \cdot \pi} \cdot \frac{q_o^2}{l_q \cdot r_{var}} \cdot (V_{n1}) \cdot V_{LM} \quad F_{cn}(r_{var}) := \frac{\mu_o}{4 \cdot \pi} \cdot \frac{q_o^2}{l_q \cdot r_{var}} \cdot V_{n1}^2$$

$$F_{mag}(r_{var}) := \frac{\mu_o}{4 \cdot \pi} \cdot \frac{(q_o)^2}{l_q \cdot r_{var}} \cdot (V_{n1} - V_{LM}) \cdot V_{LM}$$

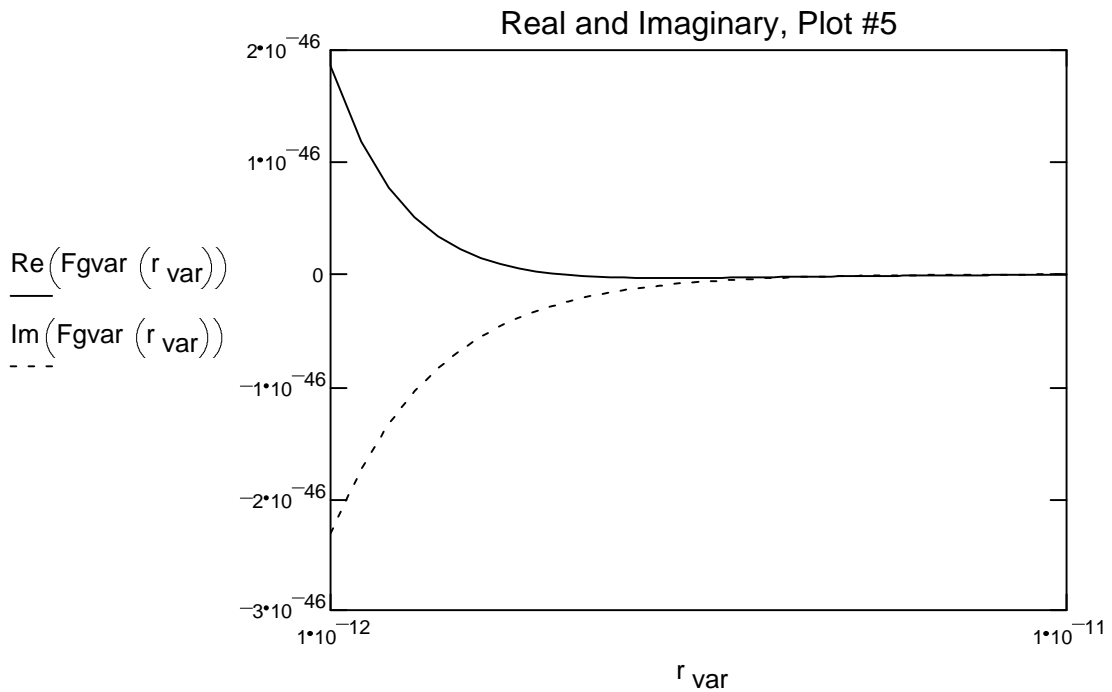
$$F_{coul}(r_{var}) := \frac{1}{4 \cdot \pi \cdot \epsilon_o} \cdot \frac{q_o^2}{r_{var}^2} \quad \text{(Vectored with centripetal force.)}$$

Then Fgvar is stated as;

(151)

$$F_{gvar}(r_{var}) := \mu_o \cdot n1' \cdot n2' \cdot \left[\begin{array}{l} \cos(\theta) \cdot (F_{cn}(r_{var}) - F_{coul}(r_{var})) \dots \\ + i \cdot \sin(\theta) \cdot (F_{cent}(r_{var}) - F_{mag}(r_{var})) \end{array} \right]^2$$

The plot of the real and imaginary resultant forces is given below in plot #5.



It is immediately apparent that as the radius of interaction decreases, the force of repulsion in the real sense increases.

For those who are in the active Mathcad mode, the X-Y plot above has the capability of being read by crosshairs if you click inside the graph to enclose the entire graph region with a blue box and then click on the pull down menu item X-Y plot and then on crosshair. Below are some copied data points from the graph above where the Compton radius was chosen as a point of interest.

$$x := 2.43493 \cdot 10^{-12} \quad y := 1.55727 \cdot 10^{-62}$$

Notice that the y value is slightly positive marking the beginning of a positive force of repulsion. This is where the zero "y" point on the left of the graph is right on the X-Y crosshair line.

The F_{coul} force is responsible for the repulsion action described above since it is of the order of 1/r² while the other terms are on the order of 1/r in each force-sum before squaring of the two force-sums to find the total force F_{gvar}. Above the Bohr radius the F_{coul} force has little effect on the total force outcome. If we allow the radius to approach the Plank length which is accepted as the radius of the beginning of the universe or the smallest possible quantum radius, the electrogravitational force exceeds the coulomb force as a force of repulsion overcoming the coulomb force of attraction and therefore the expansion phase during the big bang is accounted for as well as placing the above equation F_{gvar} as able to unify the gravitational force with the coulomb force at the beginning of the universe. The strong and weak forces have already been proposed to be unified at the same distance according to some popular contemporary works on the subject. The Plank length is arrived at in the following equation;

$$(152) \quad d_{\text{plank}} := \sqrt{\frac{G \cdot h}{2 \cdot \pi \cdot c^3}} \quad d_{\text{plank}} = 1.616048615934886 \cdot 10^{-35} \cdot \text{m}$$

Substituting this into the electrogravitational force equation for the radius of interaction instead of r_{VAR} will yield an extremely large force of repulsion. Let the new radius R_0 be equal to the Plank distance from above for the following:

$$m1'_{total} := m_e \quad m2'_{total} := m_e \quad R_0 := d_{plank}$$

$$n1' := \frac{m1'_{total}}{m_e} \quad n2' := \frac{m2'_{total}}{m_e} \quad Acc_{earth} := 9.80665 \cdot m \cdot sec^{-2}$$

$$n1' = 1 \quad n2' = 1 \quad (\text{Pure ratios})$$

next the formulae (107-110) involving the quantum force expressions;

$$F_{cent R_0} := \frac{\mu_o}{4 \cdot \pi} \cdot \frac{q_o^2}{l_q \cdot R_0} \cdot (V_{n1}) \cdot V_{LM} \quad F_{cn R_0} := \frac{\mu_o}{4 \cdot \pi} \cdot \frac{q_o^2}{l_q \cdot R_0} \cdot V_{n1}^2$$

$$F_{mag R_0} := \frac{\mu_o}{4 \cdot \pi} \cdot \frac{(q_o)^2}{l_q \cdot R_0} \cdot (V_{n1} - V_{LM}) \cdot V_{LM} \quad (\text{Vectored with centripetal force.})$$

$$F_{coul R_0} := \frac{-1}{4 \cdot \pi \cdot \epsilon_o} \cdot \frac{q_o^2}{R_0^2} \quad (\text{Negative signed to stipulate a force of attraction.})$$

Then $F_{g_{R_0}}$ is stated as;

$$(153) \quad F_{g R_0} := \mu_o \cdot n1' \cdot n2' \cdot \left[\cos(\theta) \cdot (F_{cn R_0} - F_{coul R_0}) \dots \right. \\ \left. + i \cdot \sin(\theta) \cdot (F_{cent R_0} - F_{mag R_0}) \right]^2$$

Then the force at the Plank distance taken as the beginning radius of the universe is;

$$F_{g R_0} = 3.67663353658978 \cdot 10^{45} + 5.591911902223744 \cdot 10^{22} i \cdot m^{-1} \cdot \text{henry} \cdot \text{newton}^2$$

And the coulomb force at the same radius is;

$$F_{coul R_0} = -8.833925400368829 \cdot 10^{41} \cdot \text{newton}$$

It is immediately apparent that the electrogravitational force of repulsion is greater

than the coulomb force and here we define the coulomb force as one of attraction. Thus there could be no prevalent electrical binding force until the electric force of attraction could overcome the electrogravitational force of repulsion at some larger radius of charge interaction. Let it further be stipulated that the two types of forces (centripetal), along with the coulomb, and the magnetic forces should still be active constituents in the beginning where also the major centripetal and coulomb forces are capable of switching their identities in alternate fashion so that they would all appear to be individual forces at a point in future time.

If we now assign an increasing range variable to the basic Plank radius and plot the forces electromagnetic and coulomb for the increasing force interaction radius we may be able to examine the two in a better light.

$$l := 1, 2 \dots 10 \quad m1'_{total} := m_e \quad m2'_{total} := m_e \quad R(l) := 1 \cdot 10^{-33} \cdot l \cdot m$$

$$n1' := \frac{m1'_{total}}{m_e} \quad n2' := \frac{m2'_{total}}{m_e} \quad Acc_{earth} := 9.80665 \cdot m \cdot sec^{-2}$$

$$n1' = 1 \quad n2' = 1 \quad (\text{Pure ratios})$$

$$F_{cent}'(l) := \frac{\mu_o}{4 \cdot \pi} \cdot \frac{q_o^2}{l_q \cdot R(l)} \cdot (V_{n1}) \cdot V_{LM} \quad F_{cn}'(l) := \frac{\mu_o}{4 \cdot \pi} \cdot \frac{q_o^2}{l_q \cdot R(l)} \cdot V_{n1}^2$$

$$F_{mag}'(l) := \frac{\mu_o}{4 \cdot \pi} \cdot \frac{(q_o)^2}{l_q \cdot R(l)} \cdot (V_{n1} - V_{LM}) \cdot V_{LM} \quad (\text{Vectored with centripetal force.})$$

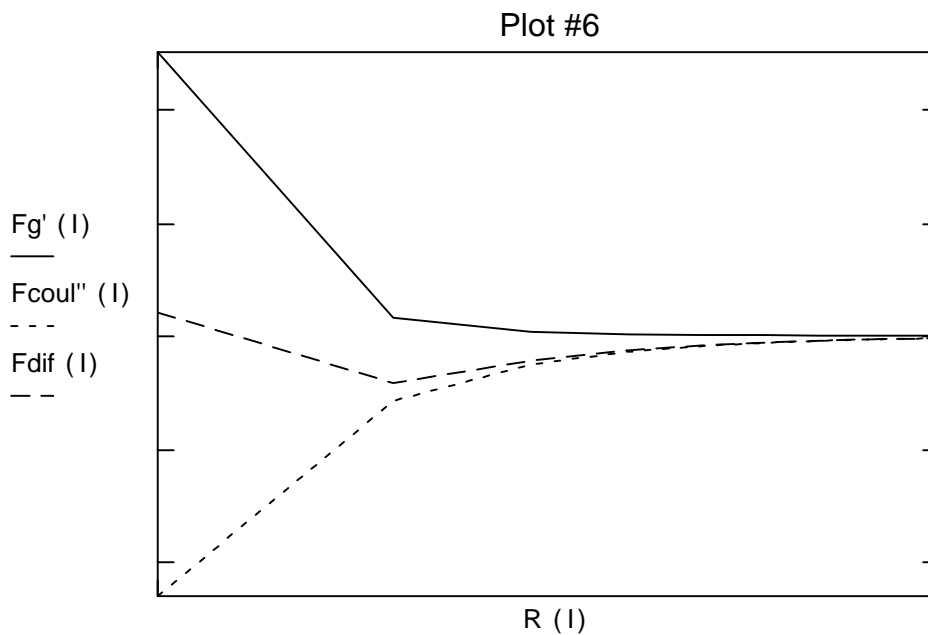
$$F_{coul}'(l) := \frac{-1}{4 \cdot \pi \cdot \epsilon_o} \cdot \frac{q_o^2}{R(l)^2}$$

Then $F_g(l)$ is stated as;

$$(154) \quad Fg' (I) := \mu_o \cdot n1' \cdot n2' \cdot \left[\cos(\theta) \cdot (F_{cn}' (I) - F_{coul}' (I)) \dots \right. \\ \left. + i \cdot \sin(\theta) \cdot (F_{cent}' (I) - F_{mag}' (I)) \right]^2$$

Assigning compatible units to Fcoul: $F_{coul}'' (I) := F_{coul}' (I) \cdot m^{-1} \cdot \text{henry} \cdot \text{newton}$

$$\text{and; } F_{dif} (I) := Fg' (I) + F_{coul}'' (I)$$



The plot above shows that the green line plotting the differential between the coulomb force and the electrogravitational force reaches a balance at the below radius where the X-Y plot feature is again used to find the value on the graph.

$$\text{Or, } Ro_{null} := 1.26602 \cdot 10^{-33} \cdot m$$

$$\text{and; } \frac{Ro_{null}}{d_{plank}} = 78.34046497837605$$

The R_o interaction distance above can be shown to have some interesting features as related to deriving the mass of the proton from the electron in the below equation;

$$(155) \quad m_{p'} := 2 \cdot m_e \cdot \left(\frac{R_{o \text{ null}}}{\sqrt{\alpha \cdot d_{\text{plank}}}} \right)$$

where;

$$m_{p'} = 1.67079336385379 \cdot 10^{-27} \cdot \text{kg}$$

and the actual mass of the proton is given by present measurements to be;

$$m_p := 1.672623100 \cdot 10^{-27} \cdot \text{kg}$$

The exact R_o can be calculated if we assume that the present proton mass is an accurate representation of what it was at the beginning of the universe, or;

$$(156) \quad R_{o \text{ actual}} := \frac{m_p}{2 \cdot m_e} \cdot \sqrt{\alpha \cdot d_{\text{plank}}}$$

$$\text{or; } R_{o \text{ actual}} = 1.267406456641462 \cdot 10^{-33} \cdot \text{m}$$

This would be the interaction distance for the electrogravitational force to equal the coulomb force where the gravitational force would begin to become one of attraction instead of repulsion. Also, please note that the equation suggests that there may be two electrons for every proton and/or that two electrons paired motion may form a mechanism related to one proton in general. The first atomic orbital for example has the capability of holding two electrons and also it is suggested by popular theory that electrons prefer to form spin pairs in a superconducting copper-oxide lattice. The distance that they are separated while this occurs may have a direct bearing on the balance of forces magnetic to centripetal as they rotate about a common center creating both forces simultaneously and generating a counter emf that isolates the

pair from the atomic lattice. Calculating a frequency differential related to the paired electron radius of separation, as in equations (139-147) previous, would allow for the possibility of inducing high temperature superconductivity in ordinary crystalline conductors by forcing electrons to oscillate around a common radius set by the external pump frequency differential that is constantly alternating between a higher to lower frequency to produce the needed differential frequency and thus wavelength differential. This may induce the so called d-wave that is theorized to be linked to superconductive action. It is suggested that instead of creating a mechanical arrangement of the right kinds of atoms in a lattice spaced just at the right wavelength one may be able to create superconductivity by impinging upon a conducting electron group a frequency-differential created wavelength as described above and the conditions would be set by the wave rather than a lattice for high temperature superconductivity. The condition may be satisfied when the centripetal force F_{C1} exactly balances the magnetic force F_{M1} in equations (139-142) previous. The slight difference allowed would be related to the least quantum electrogravitational energy derived from $E_{LM} = hf_{LM}$. Therefore, superconductivity may be related directly to electrogravitation.

It is of interest that the λ_{diff} result in (144) previous has a unique wavelength that is related fundamentally to the Compton wavelength of the electron by the square of the fine structure constant which is in itself the ratio of the coulomb field energy to the rest mass energy at the Compton radius of the electron.

(156)

$$\frac{2 \cdot \pi \cdot r_C}{\alpha} = 3.324918743191261 \cdot 10^{-10} \cdot m \quad \text{and} \quad \frac{2 \cdot \pi \cdot r_C}{\alpha^2} = 4.556335299581339 \cdot 10^{-8} \cdot m$$

where;

$$2 \cdot \pi \cdot r_{n1} = 3.324918715810513 \cdot 10^{-10} \cdot \text{m} \quad \text{and} \quad \lambda_{\text{diff}} = 4.556335470344859 \cdot 10^{-8} \cdot \text{m}$$

It is postulated by this author that the wavelength calculated to be λ_{diff} above and in equation (144) previous is possibly not only a wavelength that may be fundamental to the spin coupling of electrons in the superconducting mechanism but also fundamental to the electrogravitational mechanism as well. By a careful adjustment to the phase of the receptor wavelength mechanism, a force of anti-electrogravitation may be achieved, as well as superconductivity at the same time. The enhancement of the electrogravitational force may also be possible which would cause the absorption of radiated electromagnetic energy of all types. In equation (135) previous, an equation involving the total magnetic force expression was presented where a double sine product of angles was presented as F_{M1} . This is a standard form equation available in engineering and college textbooks with quantum distances, charges, and velocities instead of current and macroscopic distance terms. It is a combination of the law of magnetic induction and the Biot-Savart law where the details are to be presented later in this paper for the purpose of clarification. Let us bring forward this F_{M1} equation and examine it in terms of causing the total electrogravitational interaction to be one of repulsion.

$$\text{Let} \quad \theta' := \frac{\pi}{2} \quad \phi' := \frac{\pi}{2} \quad \Phi' := \frac{\pi}{2}$$

Then;

$$(157) \quad F'_{M1} := (\sin(\theta') \cdot \sin(\phi')) \cdot \left[\left(\frac{\mu_0 \cdot q_o^2}{4 \cdot \pi \cdot l_q \cdot r_{n1}} \right) \cdot \left(\frac{V_{n1}}{n} - V_{LM} \right) \right] \cdot V_{LM}$$

and let;

$$(158) \quad F'_{C1} := \frac{\mu_o}{4 \cdot \pi} \cdot \frac{q_o^2}{l_q \cdot r_{n1}} \cdot \left(\frac{V_{n1}}{n} \right) \cdot V_{LM}$$

where,

$$(159) \quad F1'_{tot} := i \cdot (F'_{C1} - F'_{M1}) \quad \text{and,} \quad F1'_{tot} = 1.25618463377314 \cdot 10^{-22} i \cdot \text{newton}$$

and for F`M2; where, $E_{\text{pump}} := 1.00000005$

$$(159) \quad F'_{M2} := (\sin(\theta') \cdot \sin(\Phi')) \cdot \left[\left(\frac{\mu_o}{4 \cdot \pi} \cdot \frac{q_o^2}{l_q \cdot r_{n1}} \right) \cdot \left(\frac{V_{n1}}{n} - V_{LM} \right) \right] \cdot E_{\text{pump}} \cdot V_{LM}$$

where V_{LM} has been increased by the pump frequency energy very little by the input multiple factor E_{pump} . The result is electrogravitational repulsion that increases in force exponentially as the pump factor is increased in small linear increments.

$$(160) \quad F'_{C2} := \frac{\mu_o}{4 \cdot \pi} \cdot \frac{q_o^2}{l_q \cdot r_{n1}} \cdot \frac{V_{n1}}{n} \cdot V_{LM}$$

or,

$$(161) \quad F2'_{tot} := i \cdot (F'_{C2} - F'_{M2}) \quad \text{and,} \quad F2'_{tot} = -3.523367794876494 \cdot 10^{-23} i \cdot \text{newton}$$

then the total electrogravitational quantum force for the above example where the $F2'_{tot}$ receptor now has a negative interaction force is;

$$(162) \quad Fg_{\text{repeI}} := F1'_{tot} \cdot \mu_o \cdot F2'_{tot}$$

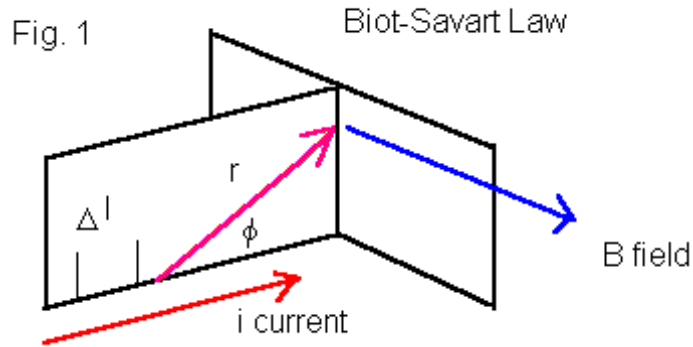
$$\text{or,} \quad Fg_{\text{repeI}} = 5.561876239010821 \cdot 10^{-51} \cdot \text{m}^{-1} \cdot \text{henry} \cdot \text{newton}^2$$

The plus Fg_{repeI} result is a force of repulsion by standard definition of the force sign of gravity. Note that only doubling E_{pump} will increase the electrogravitational force of repulsion by approximately a power of eight. This is a very large output change for

a very small input change which is likened to amplification where a small change in the control gate field has a substantial effect on the output energy. Conversely, changing the angle $\Phi/2$ to $-\Phi/2$ will increase the force of attraction by an approximate power of eight. This is a phase adjustment to the receptor mechanism that could be used to take energy in at a very large rate if need be to run the equipment needed to control and generate the wavelength differential superconducting causing field that could be employed in the construction of a spacecraft that could easily travel to the stars. The energy absorption feature could provide a vast energy supply here on Earth, or for that matter, anywhere else for as long as needed. The phase change or energy pump are both initiated and controlled by the differential wavelength alternating force field described on page 68 previous. Imagine a craft alternately taking in energy in the upward and/or forward direction and then releasing that energy in a downward and/or the rear direction. The craft would work well if simply spherical or the like and would likely make itself a nuisance if too close to external electrically controlled devices.

The following information is for those who have little or no exposure to the right-hand rule or the Biot-Savart law as introduced in this book. These are the classic field equations adapted to the quantum electrogravitational concept as previously presented.

The Biot-Savart law for magnetic induction related to a current consisting of a moving positive charge per unit time through a given distance Δl is shown in figure 1 on the next page and in the equation that follows. Any moving charge, whether by uniform motion or quantum displacement, constitutes a current and thus engenders a corresponding magnetic field.



and the equation for the magnetic induction B_t is given by the special form of;

(163)

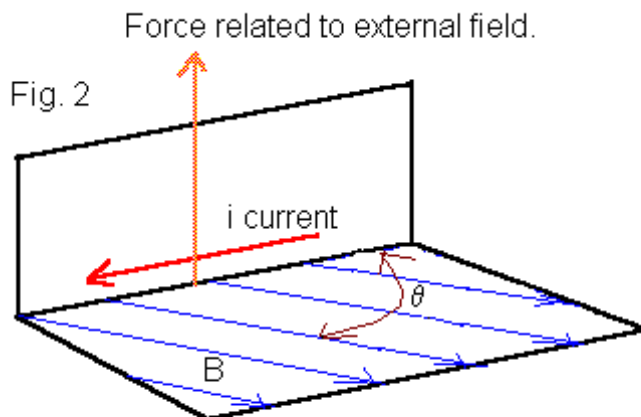
$$B_t := \frac{\mu_o}{4 \cdot \pi} \cdot \frac{I_{LM}}{l_q \cdot r_{n1}} \cdot \lambda_{LM} \cdot \sin(\phi) \quad \text{where,} \quad B_t = 9.178257017370638 \cdot 10^{-3} \cdot \text{tesla}$$

The usual expression has $1/r_{n1}^2$ instead of the electrogravitational mass-field form above of $1/l_q r_{n1}$ as the interaction distance but the result is still valid. The second figure and equation present the force arising from a current in reaction due to an external B field and in this case is the same field as above. Then;

(164)

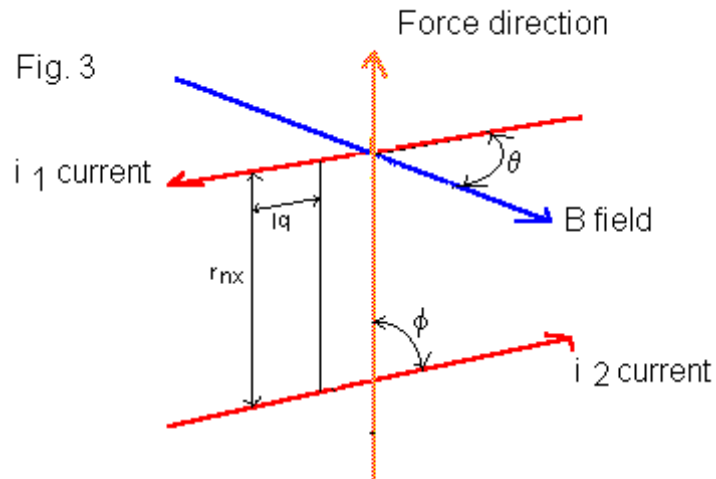
$$F1_{\text{field}} := B_t \cdot (I_{LM} \cdot \lambda_{LM} \cdot \sin(\theta)) \quad \text{or,} \quad F1_{\text{field}} = 1.256184637790049 \cdot 10^{-22} \cdot \text{newton}$$

and figure 2 below is a pictorial to help clarify this result.



The force on moving charges due to an external field.

The composite diagram of the two figures (1 & 2) is presented in figure 3 below and together they form one complete force-system that will be one part of the fundamental two-part total electrogravitational action expression that follows figure 3.



l_q is a quantum fixed distance of interaction in hyperspace and is one part of the product with r_{nx} in normal space which is a variable.

The total force representing a two-system electrogravitational interaction mechanism is represented in the below equation related directly to figure 3 above.

Let a system identical to system 1 be defined as;

$$F2_{\text{field}} := F1_{\text{field}}$$

then;

$$(165) \quad F_{\text{grav total}} := F1_{\text{field}} \cdot \mu_o \cdot F2_{\text{field}}$$

$$\text{or finally;} \quad F_{\text{grav total}} = 1.982973086498724 \cdot 10^{-50} \cdot \text{m}^{-1} \cdot \text{henry} \cdot \text{newton}^2$$

The above equation for $F_{\text{grav total}}$ is the fundamental expression for the mechanism that generates electrogravitation which is what is now called gravity. The macroscopic form has been presented previously where charge interaction multiples were expressed as a ratio of system mass to the mass of the electron. Since this

interaction is fulfilled in hyperspace the action is valid in the sense that our space exhibits mass in mass form rather than in multiples of electron charge that occur in hyperspace through the same-distance action distance l_q . Also it was shown that an expression exists that defines the mass of the electron in terms of charge², μ_o , and l_q , the fundamental hyperspace interaction distance with everything in normal space. This has some interesting implications as to all magnetic field interactions with ordinary matter in general and will be examined next.

Let us state again the equation for the electron mass defined in terms of charge squared times the permeability of free space and divided by the classic electron radius and 4 times pi;

$$(166) \quad m_e := \frac{\mu_o \cdot q_o^2}{4 \cdot \pi \cdot l_q} \quad \text{or;} \quad m_e = 9.109389688253174 \cdot 10^{-31} \cdot \text{kg}$$

secondly let us state the quantum electrogravitational expression for magnetic induction (B) again;

$$(167) \quad B''' := \left(\frac{\mu_o \cdot q_o}{4 \cdot \pi \cdot l_q} \right) \cdot \frac{1}{r_{n1}} \cdot V_{LM} \cdot \sin(\phi) \quad \text{or,} \quad B''' = 9.178257007768977 \cdot 10^{-3} \cdot \text{tesla}$$

where also; (Force = $q_o \times V$). Then:

$$(168) \quad F'''_{M1} := q_o \cdot V_{LM} \cdot \sin(\theta) \cdot \left[\left(\frac{\mu_o \cdot q_o}{4 \cdot \pi \cdot l_q} \right) \cdot \frac{1}{r_{n1}} \cdot V_{LM} \cdot \sin(\phi) \right] \quad (B)$$

or, $F'''_{M1} = 1.256184635161782 \cdot 10^{-22} \cdot \text{newton}$

The natural result of the above force result is the combination of a charge product and velocity that will yield the below well known equation for centripetal force;

$$(169) \quad F'''_C := \frac{m_e \cdot V_{LM}^2}{r_{n1}} \quad \text{or,} \quad F'''_C = 1.256184635161782 \cdot 10^{-22} \cdot \text{newton}$$

which of course implies a direct rotational equivalence to the magnetic force result in F'''_{M1} above. Thus the force of gravity directly implies the mechanics of rotational forces. The next obvious result is that of the mass times acceleration force being equivalent to each other as in Einstein's General Theory of Relativity by first solving for acceleration;

$$(170) \quad a_{LM} := \frac{F'''_{M1}}{m_e} \quad \text{or,} \quad a_{LM} = 1.378999777319515 \cdot 10^8 \cdot \text{m} \cdot \text{sec}^{-2}$$

and this particular acceleration is at the atomic r_{n1} quantum level.

$$\text{note that; } V := a_{LM} \cdot t_{LM} \quad \text{or,} \quad V = 1.374567066516408 \cdot 10^7 \cdot \text{m} \cdot \text{sec}^{-1}$$

$$\text{and; } \frac{V}{V_{n1}} = 6.28318535234866 \quad (\text{Very nearly equal to } 2 \pi),$$

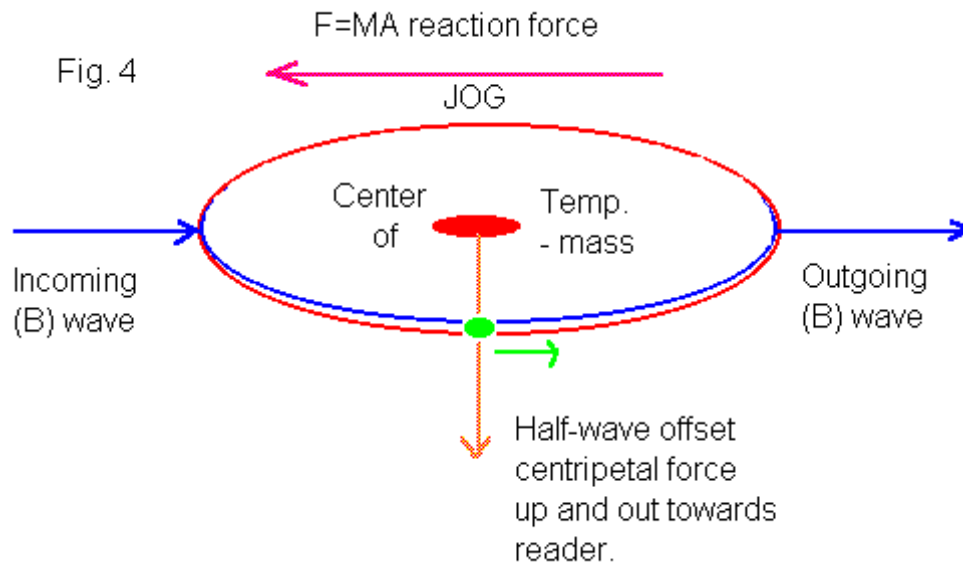
$$\text{Where; } 2 \cdot \pi = 6.283185307179586 \quad (\text{Actual}).$$

It is postulated that the incoming potential mass wave (graviton) downshifts the energy of the system and provides a tug of attractive force at that entrance point normal to the cross-sectional area of the target system and then rides around the center of negative mass created by that negative energy input and exits on the side opposite the entrance allowing the negative mass to disappear with the exit of the graviton and the mechanism just described is the so called gravitational force. The force causes a motion of closure between affected quantum mass in steps or jogs while on a macroscopic scale the motion would appear to be smooth. On a quantum scale there could be no such thing as zero motion as long as the gravitational mechanism was occurring and occur it must in normal systems.

Thus the incoming (B) wave fulfills its mass potential in the form of converting to negative mass-energy and then imparts the centripetal force through half of a cycle and then regains that negative energy and continues in the former line of motion as when it entered the affected system (or particle) imparting a force jog in the line of action opposite to its direction of motion and the system affected also is jogged in a direction normal to the direction of the through-line B wave by the temporary centripetal force. In a macroscopic sense the side motions would all cancel out except for the case where a coherent in-line motion of particles should occur then the particles would form a spiral about the common line of motion. The reader is thus prompted at this time to consider some of the commonly observed actions related to the above description such as dust devils, whirlwinds, waterspouts, water draining out of a bathtub, the motion of the planets, the rotation of the planets, stars, and galaxies themselves. All is in motion and most especially in rotational motion.

It is suggested by previous equations that the frequency differential related to the gravitational jog of any mass is related to the fundamental electrogravitational frequency f_{LM} or integer multiples thereof. All normal gravitational action may thus be interfered with by imposing the alternating frequency differential as previously suggested. The power is minute for control as compared to the resulting output but frequency stability and accuracy is most essential.

On the next page (Fig. 4) is a drawing of the system action as described above that is the gravitational action-reaction mechanism including the centripetal force vector.



It is a rule in thermodynamics that a process may be considered as reversible. This may be extended to the electrodynamic realm where for instance many processes are indeed reversible. For example, a good receiving antenna can also be considered as a good transmitting antenna, a good generator of electricity can be made into a good motor that runs on that same electricity, a dissimilar metal junction will grow cooler or hotter depending on the polarity of the direct current through it and likewise that same junction can generate a voltage proportional to the temperature applied to that junction, to name but a few. Therefore let us now apply the principle of duality in the sense of what creates a whirlwind or vortex of spinning matter particles in general.

The following is postulated concerning the electrogravitational role of creating a tornado (or like) vortex:

1. Any group of mass particles moving in a direct line away from a mass-system will rotate about a common axis laying on that line of motion and if the particles form

certain distances corresponding to the natural electrogravitational wavelength λ_{LM} the vortex process will build in intensity until chaos stops the action by scattering the constituent particles.

2. The vortex mechanics may be reversed to create the in-line vertical motion artificially by causing an ordered motion of particles about a common center of rotation where the particle paths normal and in-line are separated by integer multiples of λ_{LM} where also the process is controlled by the frequency differential energy pump process outlined previously.

3. The use of charged particles in the vortex produced naturally or artificially will build or increase the forces in-line as well as centripetal and therefore the motion vertically when considering the rate of rise will increase with the amount of coherent (organized) charged matter that is being rotated.

It is interesting that some of the science fiction movies show a saucer shaped craft rotating or revolving about a center of rotation and usually some eerie sound will accompany the image suggesting that the whole thing is like an electric motor or generator action and also is highly a organized motion. This is likely the result of persons reporting this kind of motion when actual craft were observed close at hand. I have little doubt that these craft do exist in many shapes and sizes and further that their mode of operation is electrogravitational.

The forces described above have an associative connection to the well know Coriolis force which has been described as a pseudo-force but has very real effects as we observe objects traveling horizontally in the northern hemisphere are deflected to the right and in the southern hemisphere they are deflected to the left. The force causing system rotation of organized particles moving upwards or downwards is

also a form of the Coriolis force and there are some interesting phenomena on the atomic scale that suggest the above two-frequency differential system on previous pages and a process termed the **Coriolis Operator** that is defined as "*an operator which gives a large contribution to the energy of an axially symmetric molecule arising from the interaction between vibration and rotation when two vibrations have equal or very nearly equal frequencies*",** are very closely related.

Another defined phenomena related to the **Coriolis operator** is also defined in the same reference** to be the **Coriolis resonance interactions** which are defined as, "*perturbation of two vibrations of a polyatomic molecule, having nearly equal frequencies, on each other, due to the energy contribution of the Coriolis operator.*" (A polyatomic molecule is a chemical molecule with three or more atoms). Thus, it is suggested that these phenomena serve as a detection and proof of the electro-gravitational force mechanism related to the difference frequencies that result in the integer multiples of f_{LM} which is a very small frequency compared to the two difference frequencies that generate it.

It is again stressed that the two phenomena above may serve as a proof of the existence of the defined electrogravitational mechanism as outlined in the foregoing text and in this authors previous work titled "[Electrogravitation as a Unified Field Theory.](#)" (Available on both America On Line and CompuServe as ALLFLD03.MCD and is recommended reading for clarification of this paper.) It is also a live Mathcad document that is public domain.

**--Above definition from "The McGraw-Hill Dictionary of Scientific and Technical Terms, Fifth Edition.

Quantum Electrogravitational Power Constant Dynamics

Chapter 5

This chapter presents the Poynting power vector examined in light of quantum electrogravitational formulas previously presented. The Poynting vector contains the **E** and **B** electric and magnetic fields 90 degrees to each other and also 90 degrees to the direction of travel.

First the constants of the equations to be used are stated below.

$c := 2.997924580 \cdot 10^{08} \cdot \text{m} \cdot \text{sec}^{-1}$	Free space velocity of light.
$\mu_o := 1.256637061 \cdot 10^{-06} \cdot \text{henry} \cdot \text{m}^{-1}$	Magnetic permeability.
$\epsilon_o := 8.854187817 \cdot 10^{-12} \cdot \text{farad} \cdot \text{m}^{-1}$	Free space dielectric permittivity.
$V_{LM} := 8.542454612612 \cdot 10^{-02} \cdot \text{m} \cdot \text{sec}^{-1}$	Quantum electrogravitational velocity.
$q_o := 1.602177330 \cdot 10^{-19} \cdot \text{coul}$	Electron charge
$l_q := 2.817940920 \cdot 10^{-15} \cdot \text{m}$	Classic electron radius
$r_{n1} := 5.291772490 \cdot 10^{-11} \cdot \text{m}$	Bohr radius
$r_c := 3.861593223 \cdot 10^{-13} \cdot \text{m}$	Compton electron radius
$\alpha := 7.297353080 \cdot 10^{-3}$	Fine structure constant
$f_{LM} := 1.003224805 \cdot 10^1 \cdot \text{Hz}$	Quantum electrogravitational frequency.
$t_{LM} := f_{LM}^{-1}$	Quantum electrogravitational time.

And also let us define two phase angles as;

$$\theta := \frac{\pi}{2} \qquad \phi := \frac{\pi}{2}$$

and the case for the quantum electrogravitational magnetic flux density **B** is stated as;

$$(171) \quad B := \frac{\mu_o \cdot q_o \cdot V_{LM} \cdot \sin(\theta)}{4 \cdot \pi \cdot l_q \cdot r_{n1}} \quad \text{or, } B = 9.178257004950398 \cdot 10^{-3} \cdot \text{tesla}$$

which is the same as equation 82a, page 36, in chapter two. The Poynting power vector is given below in terms of B as:

$$(172) \quad S_{\max} := \frac{c \cdot B^2}{\mu_0} \quad \text{or,} \quad S_{\max} = 2.009700163795925 \cdot 10^{10} \cdot \text{watt} \cdot \text{m}^{-2}$$

which gives the magnitude of \mathbf{S} as being equal to the rate at which energy is being transported per unit cross-sectional area and the direction of \mathbf{S} (the vector) is the direction of the wave itself. The electric field may be found by solving for \mathbf{E} since \mathbf{S} and \mathbf{B} are given above by equation (173) below.

$$(173) \quad E := \frac{S_{\max} \cdot \mu_0}{B} \quad \text{or,} \quad E = 2.751572227669798 \cdot 10^6 \cdot \text{volt} \cdot \text{m}^{-1}$$

which is related to the expression;

$$(174) \quad S := \frac{E \cdot B}{\mu_0} \quad \text{where,} \quad S = 2.009700163795926 \cdot 10^{10} \cdot \text{m}^{-2} \cdot \text{watt}$$

note that;

$$(175) \quad q_0 \cdot V_{LM} = 1.368652712288088 \cdot 10^{-20} \cdot \text{amp} \cdot \text{m}$$

and;

$$(176) \quad I_B := \frac{q_0 \cdot V_{LM} \cdot \sin(\phi)}{I_q} \quad \text{or,} \quad I_B = 4.85692479417946 \cdot \mu\text{A}$$

(= Electrogravitational current constant through the hyperspace distance, I_q)

$$(177) \quad B' := \frac{\mu_0 \cdot I_B \cdot \sin(\theta)}{4 \cdot \pi \cdot r_{n1}} \quad \text{or,} \quad B' = 9.1782570049504 \cdot 10^{-3} \cdot \text{tesla}$$

solving for S_{\max} in terms of current/meter where, $S'_{\max} := S_{\max}$;

$$(178) \quad \frac{S'_{\max} \cdot \mu_0}{c} = \frac{\mu_0^2 \cdot I_B^2 \cdot \sin^2(\theta)}{(4 \cdot \pi \cdot r_{n1})^2}$$

has solution(s)

$$(179) \quad S'_{\max} := I_B^2 \cdot \frac{\sin(\theta)^2}{16 \cdot \pi^2 \cdot r_{n1}^2} \cdot \mu_o \cdot c \quad \text{where}$$

$$\text{where,} \quad S'_{\max} = 2.009700163795926 \cdot 10^{10} \cdot \text{watt} \cdot \text{m}^{-2}$$

$$\text{and where,} \quad R_s := c \cdot \mu_o \quad \text{or,} \quad R_s = 376.7303133310859 \cdot \Omega$$

(= Free-space impedance.)

$$\text{also,} \quad S''_{\max} := (I_B^2) \cdot R_s \cdot \frac{\sin(\theta)^2}{16 \cdot \pi^2 \cdot r_{n1}^2}$$

$$\text{and thus,} \quad S''_{\max} = 2.009700163795926 \cdot 10^{10} \cdot \text{watt} \cdot \text{m}^{-2}$$

The above power in S'_{\max} is very large compared to expected quantum power levels at the Bohr radius of r_{n1} .

The formula for quantum power related to the electrogravitational least quantum velocity vector V_{LM} is given below in equation (180). First some more constants need to be defined however.

$$h := 6.626075500 \cdot 10^{-34} \cdot \text{joule} \cdot \text{sec} \quad m_e := 9.109389700 \cdot 10^{-31} \cdot \text{kg}$$

$$r_{LM} := \frac{h}{2 \cdot \pi \cdot m_e \cdot V_{LM}} \quad \text{or,} \quad r_{LM} = 1.355203610805924 \cdot 10^{-3} \cdot \text{m}$$

$$L_Q := \frac{\pi \cdot \mu_o \cdot (r_{LM}^2)}{I_q} \quad \text{or,} \quad L_Q = 2.572983215823832 \cdot 10^3 \cdot \text{henry}$$

$$C_Q := \frac{4 \cdot \pi \cdot \epsilon_o \cdot (r_{LM}^2)}{r_{n1}} \quad \text{or,} \quad C_Q = 3.86159328077506 \cdot 10^{-6} \cdot \text{farad}$$

then;

$$(180) \quad S_{LM\max} := L_Q \cdot \left(\frac{I_{LM}}{t_{LM}} \right) \cdot \frac{1}{t_{LM}} \cdot \left(\frac{q_o}{t_{LM}} \right) \quad \text{where,} \quad I_{LM} := \frac{q_o}{t_{LM}}$$

Then,

$$S_{LMmax} = 6.668880003409421 \cdot 10^{-32} \cdot \text{watt}$$

And,

$$I_{LM} = 1.607344039464671 \cdot 10^{-18} \cdot \text{amp}$$

and also,

$$(181) \quad R_Q := \frac{h}{q_o^2} \quad \text{or,} \quad R_Q = 2.581280587436064 \cdot 10^4 \cdot \text{ohm}$$

or,

$$(182) \quad P_Q := \left(\frac{q_o}{t_{LM}} \right)^2 \cdot R_Q \quad \text{or,} \quad P_Q = 6.668880009798361 \cdot 10^{-32} \cdot \text{watt}$$

Resolving equation (179) for max power to equations (180) and (182) quantum power;

$$(183) \quad S_{QLM} := (I_B^2) \cdot R_s \cdot \frac{\sin(\theta)^2}{16 \cdot \pi^2 \cdot r_{LM}^2} \cdot (2 \cdot r_c \cdot I_q) \quad \text{or,}$$

where,

$$S_{QLM} = 6.668879942072169 \cdot 10^{-32} \cdot \text{watt} \quad \text{and,} \quad \frac{S_{QLM}}{P_Q} = 0.999999989844443$$

The relationship of equation (183) above to Planks constant is established by the equation (184) below.

(Pc)

$$(184) \quad h' := \left[(I_B^2) \cdot R_s \right] \cdot \frac{\sin(\theta)^2}{16 \cdot \pi^2 \cdot r_{LM}^2} \cdot (2 \cdot r_c \cdot I_q) \cdot (t_{LM}^2)$$

$$h' = 6.626075432708512 \cdot 10^{-34} \cdot \text{joule} \cdot \text{sec} \quad \text{where the ratio of } h \text{ to } h' \text{ is;}$$

$$\text{where,} \quad \frac{h}{h'} = 1.000000010155557$$

The equation in (184) above is similar to the equation (15) on page 9 where the macroscopic forms of field energy density times a **gate** consisting of area times time

yielded the least quantum related output form. Note that r_{LM} instead of r_{n1} is used in the denominator of equation (184) above which suggests that the conversion process from the electromagnetic domain of the \mathbf{S} poynting power vector to the quantum electrogravitational domain is reliant on the least quantum electrogravitational distance r_{LM}^2 as a surface interface that when multiplied by the area time gate ($2 r_c I_q t_{LM}^2$) interfaces directly to the quantum Plank power constant, h .

Note also that there is a power constant expressed by the I^2R term in equation (184) above and its numerical constant result is shown in equation (185) below.

$$(185) \quad P_C := (I_B^2) \cdot R_S \quad \text{or,} \quad P_C = 8.886962025439721 \cdot 10^{-9} \cdot \text{watt}$$

(= Electrogravitational power constant through the hyperspace distance, I_q .)

where again, $I_B = 4.85692479417946 \cdot 10^{-6} \cdot \text{amp}$ from equation (176).

The quantum electrogravitational voltage constant through the hyperspace distance related to the power and current constants above is;

$$(186) \quad E_P := \sqrt{P_C \cdot R_S} \quad \text{or,} \quad E_P = 1.829750799536748 \cdot \text{mV}$$

where, $I_B = 4.85692479417946 \cdot \mu\text{A}$

and a quick check yields the product of E and I as;

$$(187) \quad P'_C := E_P \cdot I_B \quad \text{or,} \quad P'_C = 8.886962025439721 \cdot 10^{-9} \cdot \text{watt}$$

This power constant is a power kernel that may be tapped by the appropriate frequency differential pulse probe as examined on pages (66-68) previous in chapter 4. This power constant is also postulated as existing throughout all of space and the power kernel also embodies a constant force as will be shown later in eq. (196).

and,

$$(191) \quad gk := \left(\mu_o \cdot q_o \cdot V_{LM} \cdot \sin(\phi) \right) \quad \text{note:}$$

where, $gk = 1.719899721899381 \cdot 10^{-26} \cdot \text{weber} \quad (\text{volt} \times \text{sec} = \text{weber})$

Returning to equation (189) for the moment, it is of interest that the variable form of the Poynting vector power expression can be shown as equal to a power constant that is contained in the electrogravitational form as well as the electromagnetic form. This is shown below in equation (192).

$$(192) \quad ScK := \left(\frac{I_b}{q_o \cdot V_{LM} \cdot \sin(\phi)} \right) \cdot R_s \cdot \left(\frac{q_o \cdot V_{LM} \cdot \sin(\phi)}{I_q} \right)$$

where, $ScK = 8.886962025439721 \cdot 10^{-9} \cdot \text{watt} \quad (= \text{a radiation power constant.})$

and, from the above related equations in (186-187),

$$P'_c = 8.886962025439721 \cdot 10^{-9} \cdot \text{watt} \quad \text{as a check.}$$

Then utilizing the power constant in equation (192) above;

$$(193) \quad F_{grav} := \left(\frac{\text{(weber/m)}}{\mu_o \cdot q_o \cdot V_{LM} \cdot \sin(\theta)} \right) \cdot \left(\frac{\text{(newton)}}{ScK} \right) \cdot \left(\frac{\text{(weber/m)}}{4 \cdot \pi \cdot r_{n1}} \right)$$

$$\text{or,} \quad F_{grav} = 1.982973075765095 \cdot 10^{-50} \cdot \text{newton} \cdot \text{weber}^2 \cdot \text{m}^{-2}$$

$$\text{and,} \quad F_{grav} = 1.982973075765095 \cdot 10^{-50} \cdot \text{newton}^2 \cdot \frac{\text{henry}}{\text{m}} \quad \text{also.}$$

where,

$$(194) \quad gk_{rn1} := \left(\frac{\mu_o \cdot q_o \cdot V_{LM} \cdot \sin(\theta)}{4 \cdot \pi \cdot r_{n1}} \right)$$

$$\text{or,} \quad gk_{rn1} = 2.586378598852638 \cdot 10^{-17} \cdot \frac{\text{weber}}{\text{m}} \quad (\text{at } r_{n1})$$

and checking dimensional units;

$$(195) \quad gk_{n1}^2 \cdot \frac{ScK}{c} = 1.982973075765096 \cdot 10^{-50} \cdot \text{newton} \cdot \frac{\text{weber}^2}{\text{m}^2}$$

where, $ScK \cdot \frac{1}{16 \cdot \pi^2 \cdot r_{n1}^2} = 2.009700163795926 \cdot 10^{10} \cdot \text{watt} \cdot \text{m}^{-2}$ (at the Bohr radius.)

and, $ScK = 8.886962025439721 \cdot 10^{-9} \cdot \text{watt}$ = the universal electromagnetic / electrogravitational quantum constant of least power radiation.

Also, it may be of interest to note that there is now demonstrated a new force constant related to the connecting term of the power constant divided by the velocity of light in equation (193) above and that is shown below in equation (196).

$$(196) \quad F_{GP} := \frac{ScK}{c} \quad \text{or,} \quad F_{GP} = 2.964371447076138 \cdot 10^{-17} \cdot \text{newton}$$

The force constant F_{GP} will also be ubiquitous to all of space and exist as part of the 'fabric' of space-time for all time.

Equation (193) above is a statement involving a product of potentials times a power constant which suggests that the electrogravitational interaction may be an interaction involving the product of magnetic vector potentials and a least quantum power constant of radiation. The dimensional units in equation (195) tend to suggest that magnetic potentials seem to be at the heart of the electrogravitational action mechanism. There is also an interesting facet involving a unit of dimension related to fluid mechanics that relates to the electrogravitational expression. This is called the **poiseuille** and the definition is given below as a quote from the McGraw-Hill Dictionary of Scientific and Technical Terms, Fifth Edition as;

"poiseuille - A unit of dynamic viscosity of a fluid in which there is a tangential force equal to one newton per square meter resisting the flow of two parallel layers past each other when their differential velocity is one meter per second per meter of separation; equal to 10 poise; used chiefly in France. Abbreviated *Pl.*"

The other unit, the **weber**, is defined as:

"weber - The unit of magnetic flux in the meter-kilogram-second system, equal to the magnetic flux which, linking a circuit of one turn, produces in it an electromotive force of 1 volt as it is reduced to zero at a uniform rate in 1 second. Symbolized *Wb.*" (From the same source as the definition of the poiseuille.)

Then repeating equation (193) in equation (197) below;

$$(197) \quad F_{\text{grav}} := \left(\frac{\overset{\text{(weber/m)}}{\mu_0 \cdot q_0 \cdot V_{LM} \cdot \sin(\theta)}}{4 \cdot \pi \cdot r_{n1}} \right) \cdot \left(\frac{\overset{\text{(newton)}}{ScK}}{c} \right) \cdot \left(\frac{\overset{\text{(weber/m)}}{\mu_0 \cdot q_0 \cdot V_{LM} \cdot \sin(\theta)}}{4 \cdot \pi \cdot r_{n1}} \right)$$

and now the poiseuille is defined in terms of the poise as:

$$\text{poiseuille} := 10 \cdot \text{poise}$$

$$\text{then; } F_{\text{grav}} = 1.982973075765095 \cdot 10^{-50} \cdot \text{weber} \cdot \text{volt} \cdot \text{poiseuille}$$

The units of gravity (electrogravitation) expressed in weber-volt- poiseuille directly implies the concept of induced potential linked to flowing parallel layers of flux and is also strikingly related to a facet of chaos theory involving chaos caused by viscosity when flow is pushed past the limit of local stability to bifurcation. It implies that gravity may exhibit chaotic action if the density of the local field were pushed high enough and the potential gradient were strong enough. This was explored in part in pages 43

to 47 of chapter three. The link to fluid mechanics by the equation in (197) previous is intriguing to say the least.

Other units resulting from further dimensional analysis of equation (193) can be illustrated as shown below as equation (198) below.

$$(198) \quad F_{\text{grav}} := \left(\frac{\overset{\Phi}{\text{(weber)}}}{\mu_0 \cdot q_0 \cdot V_{LM} \cdot \sin(\theta)} \right) \cdot \left(\frac{\overset{F}{\text{(newton)}}}{\frac{\text{ScK}}{c}} \right) \cdot \left(\frac{\overset{B}{\text{(tesla)}}}{4 \cdot \pi \cdot r_{n1}^2} \right)$$

where,

$$F_{\text{grav}} = 1.982973075765095 \cdot 10^{-50} \cdot \text{weber} \cdot \text{newton} \cdot \text{tesla}$$

and the units in parenthesis may be listed as follows for their values as;

$$(199) \quad \text{weber}_{GK} := \left(\frac{\mu_0 \cdot q_0 \cdot V_{LM} \cdot \sin(\theta)}{4 \cdot \pi} \right)$$

or, $\text{weber}_{GK} = 1.368652711813313 \cdot 10^{-27} \cdot \text{weber}$ (= a constant.)

$$(200) \quad \text{newton}_{GK} := \left(\frac{\text{ScK}}{c} \right) \quad \text{where} \quad \text{ScK} = 8.886962025439721 \cdot 10^{-9} \cdot \text{watt}$$

(= Equation (192))

or, $\text{newton}_{GK} = 2.964371447076138 \cdot 10^{-17} \cdot \text{newton}$

= a constant = eq. (196).

$$(201) \quad \Delta_{\text{tesla}} := \left(\frac{\mu_0 \cdot q_0 \cdot V_{LM} \cdot \sin(\theta)}{4 \cdot \pi \cdot r_{n1}^2} \right)$$

or, $\Delta_{\text{tesla}} = 4.88754685455617 \cdot 10^{-7} \cdot \text{tesla}$ (At r_{n1})

The above analysis of equation (198) by equations (199), (200), and (201) present the electrogravitational equation in the form of a constant weber unit times a constant involving a quantum power unit divided by the velocity of light (which produces a newton force constant) and finally the product of those two times a tesla

unit whose strength is inversely proportional to the square of the action radius in the denominator and this net final product equals the quantum electrogravitational force.

The analysis clearly shows the electromagnetic nature of gravitation as well as the mechanics of the constituents in their contribution to the total electrogravitational action. Equation (199) is the quantum electrogravitational flux constant (weber), equation (200) is the quantum power-newton constant, and equation (201) is the quantum variable of magnetic induction (tesla) inversely proportional to the interaction radius squared. (Also tesla is known as the weber/meter² and is usually denoted by the capital letter B. Also the weber is denoted by the symbol Φ .) From the above the action can be said to flow like a fluid that contains a quantum magnetic constant and a quantum power constant with a magnetic induction strength inversely proportional to the square of the interaction distance.

It may be of interest to ponder about whether or not the electrogravitational action has a quantum wave nature and the force is controlled by that wave from one point of interaction to another somewhat like an ordinary electromagnetic wave or if it has a medium of transport that is only a little like the electromagnetic wave or even if the action is not of the wave process at all. It may well be that it certainly has an energy density and thus an equivalent frequency in the quantum sense. Further, that energy equivalent frequency is most likely related to a packet mechanism, also in the quantum sense. Thus it is proposed that it can exhibit local wavelike properties at the point of action-reaction but may not travel from one point to another like an ordinary electromagnetic wave.

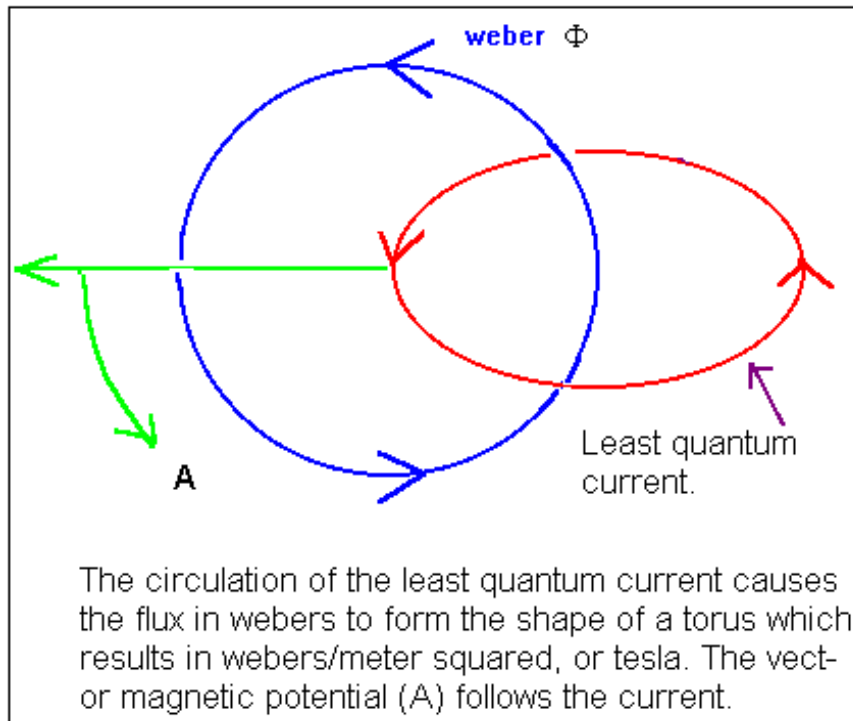
That is, the $S_{cK/c}$ portion representing the power constant of equation (192)

divided by the free space velocity of light, (which further defines the quantum force constant in equation (196)), may exhibit local wave like properties. This is shown in equation (197) and (198) in its entire form. It is also postulated that in between local action points the electrogravitational energy flows in quantum packets of magnetic flux that over time appear to be continuously acting on all matter. **In other words the gravitational energy spends part of the time in hyperspace and part of the time in normal space.**

This is closely related to the wavefunction ψ as encountered in quantum mechanics. This wavefunction can be utilized in Schrodinger's wave equation to arrive at the probability of where a particle is as well as its amplitude at any given time. This quantum concept will be examined fully in the last chapter where the vector magnetic potential is more fully examined in light of the work by David Bohm. His pioneering work on potentials related to wave mechanics has far reaching implications that are very close to my own work insofar as the non-local aspect of particle interaction at a distance is concerned.

The vector relationship of the electrogravitational constituents in equation (198) may well place the variable tesla at 90 degrees to the $q_o * V_{LM}$ current and the force constant 90 degrees to the weber constant. Then the direction of potential would be 90 degrees to the weber constant and the variable tesla unit. This of course is a fourth dimensional unit not directly perceivable in normal three dimensional space. A likely mechanism showing three of the four action motions is shown next in figure 5. The fourth action will be left to the reader to imagine as being in hyperspace where all points in three dimensional space become one point.

Figure 5



The torus packet would appear as an expanding probability wave with three dimensional locations connected by four dimensional hyperspace.

Then in a partial sense, the electrogravitational action may well act at a distance instantaneously but the reaction result in normal space must be at a velocity less than the velocity of light in free space.

The resulting torus shape in three dimensions can be shown with the aid of Mathcads ability to plot parametric surface plots. In fact there exists in the Mathcad user guide the following useful and pertinent example. This is a static example.

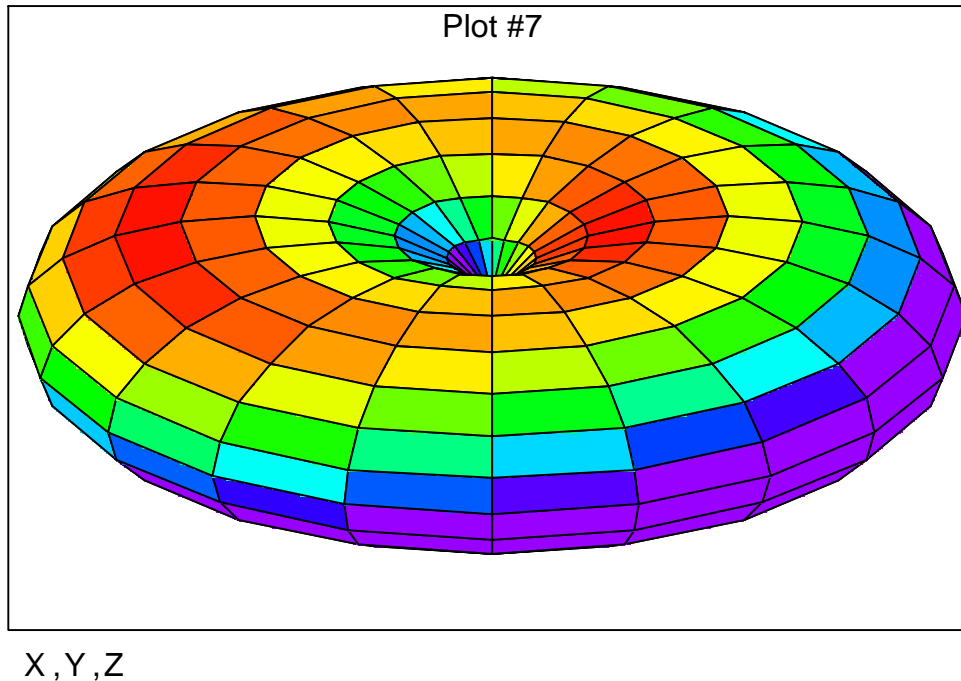
(Non-expanding.) First, the following parameters are established:

$$a := 0..20 \quad b := 0..20 \quad r := 1 \quad R := 1 \quad \phi_a := \frac{2 \cdot \pi \cdot a}{20} \quad \theta_b := \frac{2 \cdot \pi \cdot b}{20}$$

$$X_{a,b} := (R + r \cdot \cos(\theta_b)) \cdot \cos(\phi_a) \quad Y_{a,b} := (R + r \cdot \cos(\theta_b)) \cdot \sin(\phi_a)$$

$$Z_{a,b} := r \cdot \sin(\theta_b)$$

See plot #7 on page 103 next.



The above is from page 425 of the Mathcad 5.0+ manual.

The outside surface of the torus is the variable tesla component inversely proportional to the area at some instant of time and is step-expanding outwards at a rate directly proportional to time. The area of a torus at r_{n1} is given below in eq. (202).

$$(202) \quad A_T := 4 \cdot \pi^2 \cdot r_{n1}^2 \quad \text{where,} \quad A_T = 1.105508446674703 \cdot 10^{-19} \cdot \text{m}^2$$

This is equivalent to linking two wavelengths through each other and then rotating and expanding them at the same time.

Returning to equation (192), the concept of a radiation power quantum constant is important in the sense that it must be ubiquitous to all matter or radiation. It is making the statement for a power that can be tapped if the proper control probe frequencies are applied. The power constant eq. in (192) is repeated in equation (203) below.

Restoring the initial phase angle definitions, $\theta := \frac{\pi}{2}$ $\phi := \frac{\pi}{2}$

Then,

$$(203) \quad ScK := \left(\frac{q_o \cdot V_{LM} \cdot \sin(\phi)}{I_q} \right) \cdot R_s \cdot \left(\frac{q_o \cdot V_{LM} \cdot \sin(\phi)}{I_q} \right)$$

where, $ScK = 8.886962025439721 \cdot 10^{-9} \cdot \text{watt}$

Since power is energy per unit time then a time product with the ScK power above that would equal the least quantum electrogravitational energy quantum is derived below in equation (204).

where, $E_{LM} := h \cdot f_{LM}$ or, $E_{LM} = 6.647443301402777 \cdot 10^{-33} \cdot \text{joule}$

then,

$$(204) \quad t_{ScK} := \frac{E_{LM}}{ScK} \quad \text{or,} \quad t_{ScK} = 7.479995168623291 \cdot 10^{-25} \cdot \text{sec}$$

the maximum energy in electron volts related to t_{ScK} is solved for below in equation (205). (Derived from Heisenbergs uncertainty principle $h = E \times T$ and electron volts = energy / q_o .)

where, $Gev := 1 \cdot 10^9 \cdot \text{volt}$ then:

$$(205) \quad eV_g := \frac{h}{q_o \cdot t_{ScK}} \quad \text{or,} \quad eV_g = 5.528973142799933 \cdot Gev$$

The equation in (205) above may suggest the existence of a quasi-particle that ordinarily is invisible but can make itself felt gravitationally and perhaps in some way electromagnetically or through the weak force. The ratio of the energy in electron volts of the proton by comparison is given below.

where, $m_p := 1.672623100 \cdot 10^{-27} \cdot \text{kg}$

then, $eV_p := \frac{m_p \cdot c^2}{q_o}$ or, $eV_p = 9.382723404280287 \cdot 10^8 \cdot \text{volt}$

or,

$$(206) \quad qVratio := \frac{eV_g}{eV_p} \quad \text{and} \quad qVratio = 5.892716756712322$$

Equation (206) suggests the expectant mass of the quasi-particle carrying the constant power ScK to be equal to the mass of the proton times the ratio in equation (206).

then,

$$(207) \quad M_{ScK} := m_p \cdot qVratio \quad \text{or,} \quad M_{ScK} = 9.856294169034111 \cdot 10^{-27} \cdot \text{kg} \quad (\text{Electrograviton and/or Higgs boson?})$$

It is postulated here that the M_{ScK} quasi-particle may be likened to the H^0 (Higgs) boson if not at times the same. Then the link for a connection particle between the electromagnetic, electroweak, and the electrogravitational force-action may be embodied in the above constant power particle in equations (205), (206), and (207). Further, the ScK power constant may be complex constant power in the sense that if it were terminated into a proper conjugate load it would supply that power to the load indefinitely. (Definitely food for thought.)

It is of interest that the force constant of ScK divided by c (which was presented by equation (196)) further divided by the mass of the M_{ScK} particle is shown to yield the quantum electrogravitational acceleration constant A_{em} which was first presented as equation (56) on page 22.

This is shown in equation (208) next.

$$(208) \quad A_{LM} := \frac{F_{GP}}{M_{ScK}} \quad \text{or,} \quad A_{LM} = 3.007592302175207 \cdot 10^9 \cdot \text{m} \cdot \text{sec}^{-2}$$

$$\text{and,} \quad A_{em} := c \cdot f_{LM} \quad \text{or,} \quad A_{em} = 3.007592302175207 \cdot 10^9 \cdot \text{m} \cdot \text{sec}^{-2}$$

where the two accelerations are shown to be identical.

The electrogravitational equation in (198) above may provide some clue to how the ScK power constant particle may be induced to make an appearance. The generation of the appropriate weber and tesla field interaction by quantum means would likely create the connection particle ScK. Thus control of an electrogravitational field as well as creating a tap into a limitless power source is a possible result of the correct application of a system of interacting magnetic fields on a quantum scale.

In order that the electrogravitational equation may be applied to the macroscopic scale with the proper force sign a small change may be made to the action-reaction angle for ϕ in equation (203) above. This is accomplished in equation (209) below as well as some scaling for the proper force magnitude by reason of mass ratios of the individual masses being considered to the mass of one electron. The total force being considered will be for a one kilogram mass at the surface of the Earth and the ratio of the total mass of the Earth to one electron will represent the #1 multiplier and the mass of one kilogram to one electron will represent the #2 multiplier. Also the ScK constant power function will then become a sum total of the multiples of the mass of an electron that will equal the #1 multiplier with the product of the sum total of the multiples of the mass of one electron that will equal the #2 multiplier. Let the following constants be established for input:

Earth mass

$$M1 := 5.98 \cdot 10^{24} \cdot \text{kg}$$

$$R1 := \frac{M1}{m_e}$$

$$\phi1 := \frac{\pi}{2}$$

Surface body mass

$$M2 := 1 \cdot \text{kg}$$

$$R2 := \frac{M2}{m_e}$$

$$\phi2 := -\frac{\pi}{2} \quad (\text{conjugate angle of interaction})$$

$$(209) \quad \text{ScK}' := \left(\frac{q_o \cdot V_{LM} \cdot \sin(\phi1)}{I_{B1}} \right) \cdot R_s \cdot \left(\frac{q_o \cdot V_{LM} \cdot \sin(\phi2)}{I_{B2}} \right)$$

and, $\text{ScK}' = -8.886962025439721 \cdot 10^{-9} \cdot \text{watt}$

thus, $\text{Smac} := R1 \cdot R2 \cdot \text{ScK}'$ or, $\text{Smac} = -6.404363079308414 \cdot 10^{76} \cdot \text{watt}$

Now include a statement for the radius of the Earth and then apply equation (198) to yield the electrogravitational force.

or, $r_E := 6.37 \cdot 10^6 \cdot \text{m}$

total quantum

$$(210) \quad F1_{\text{grav}} := \left(\frac{\Phi \text{ (weber)}}{4 \cdot \pi} \right) \cdot \left(\frac{\text{pressure (Pascal)}}{c \cdot r_E^2} \right) \cdot \left(\frac{\Phi \text{ (weber)}}{4 \cdot \pi} \right)$$

or, $F1_{\text{grav}} = -9.861952401350994 \cdot \text{Pa} \cdot \text{weber}^2$ (The negative power = an energy / time sink.)

and,

$$(211) \quad \text{Press}' := \left(\frac{\text{Smac}}{c \cdot r_E^2} \right) \quad \text{or,} \quad \text{Press}' = -5.264733323319333 \cdot 10^{54} \cdot \text{Pa}$$

Compare eq. (210) with the standard gravitational force in equation (212) below.

where, $G := 6.672590000 \cdot 10^{-11} \cdot \text{newton} \cdot \text{m}^2 \cdot \text{kg}^{-2}$ then,

$$(212) \quad F_{\text{standard}} := \frac{-G \cdot M1 \cdot M2}{r_E^2} \quad \text{or,} \quad \{ \text{A (-) force is one of attraction.} \}$$

where, $F_{\text{standard}} = -9.833695575561464 \cdot \text{newton}$

The forces are very nearly equal and note that the standard gravitational force equation does not include the total quantum electrogravitational mechanism.

Equation (209) and (211) yielded a very large power and pressure respectively and both are moderated by the volt x time of the weber function as equation (213) shows below.

$$(213) \quad \Phi := E_P \cdot t_{\text{ScK}} \quad \text{or,} \quad \Phi = 1.368652714031948 \cdot 10^{-27} \cdot \text{weber}$$

The time t_{ScK} , when used as a multiplier to form a time-gate much like the one established by equation (184) previous, will scale the large magnitudes of equation (209) and (211) to much smaller values. This is shown in equation (214) below.

$$\text{where,} \quad t_{\text{ScK}} = 7.479995168623291 \cdot 10^{-25} \cdot \text{sec}$$

$$\text{and} \quad E_P = 1.829750799536748 \cdot 10^{-3} \cdot \text{volt} \quad \text{then,}$$

$$(214) \quad \Phi \cdot \text{Press}' \cdot \Phi = -9.861952433324145 \cdot \text{Pa} \cdot \text{weber}^2 \quad (= F1\text{grav above.})$$

The time-gate rations out the very large magnitudes associated with hyperspace to values or magnitudes that we are accustomed to in our three dimensional space. It is as if our space receives its portion out of the energy that serves as the input source for many universes like ours. It may be likened to a four dimensional Nautilus shell where there are a great many compartments, only in the case of our universe, the compartment is our known three dimensional space. This is a version of the many worlds of quantum mechanics.

The negative ScK power constant can be examined for the time-gate value as in equation (204) for equation (215) next.

$$(215) \quad t'_{\text{ScK}} := \frac{E_{\text{LM}}}{\text{ScK}'} \quad \text{or,} \quad t'_{\text{ScK}} = -7.479995168623291 \cdot 10^{-25} \cdot \text{sec}$$

$$\text{therefore,} \quad M'_{\text{ScK}} := \frac{h}{t'_{\text{ScK}} \cdot c^2} \quad \text{or,} \quad M'_{\text{ScK}} = -9.856294169034111 \cdot 10^{-27} \cdot \text{kg}$$

The negative mass term in equation (215) above implies a negative energy aspect to the electrogravitational action mechanism which of course would also account for gravity being a force of attraction since at the interaction point the momentum would also be negative or towards the incoming electrograviton which is the M'_{ScK} particle above in equation (215). As a check on the mechanics, equation (213) is stated in terms of negative time below in equation (216).

$$(216) \quad \Phi' := E_{\text{P}} \cdot t'_{\text{ScK}} \quad \text{or,} \quad \Phi' = -1.368652714031948 \cdot 10^{-27} \cdot \text{weber}$$

then,

$$(217) \quad \Phi' \cdot \text{Press}' \cdot \Phi' = -9.861952433324145 \cdot \text{weber}^2 \cdot \text{Pa} \quad \text{which is equivalent to:}$$

$$\Phi' \cdot \text{Press}' \cdot \Phi' = -9.861952433324145 \cdot \text{newton}^2 \cdot \frac{\text{henry}}{\text{m}} \quad (= F1_{\text{grav}} \text{ in (210)})$$

The negative weber units are a direct result of the negative time unit of eq. (215).

The time t'_{ScK} may be related to a relativistic expression concerning the time-gate becoming larger with an increase of relative velocities between electrogravitationally interacting systems or particles.

$$\text{let} \quad V_{\text{rel}} := 2 \cdot 10^8 \cdot \text{m} \cdot \text{sec}^{-1} \quad \text{thus,} \quad t''_{\text{ScK}} := \frac{t'_{\text{ScK}}}{\sqrt{1 - \frac{V_{\text{rel}}^2}{c^2}}}$$

then, the new flux value will be;

$$(218) \quad \Phi'' := E_{\text{P}} \cdot t''_{\text{ScK}} \quad \text{or,} \quad \Phi'' = -1.837258464081576 \cdot 10^{-27} \cdot \text{weber}$$

thus, $F_{1rel} := \Phi'' \cdot Press' \cdot \Phi''$ or, $F_{1rel} = -17.77120559300159 \cdot \text{weber}^2 \cdot \text{Pa}$

It is demonstrated by equation (218) above that the force of gravity will increase by a factor of $(\Gamma)^2$. This also applies to equation (212) for $F_{standard}$ where $M1$ and $M2$ will be relativistically affected since neither can be considered the absolute frame of reference.

It is also demonstrated that the antiparticle for M_{ScK} of equation (207) is developed in equation (215) as M'_{ScK} which is identical in mass but opposite in mass or energy sign.

The final equation that brings it all together as the force of electrogravitation equivalent to the normal force of gravitation encompassing the case for the inclusion of relativistic effects between relative observers is shown below.

Let; $v_x := 1 \cdot \text{m} \cdot \text{sec}^{-1}$ and $\Gamma := \sqrt{1 - \frac{v_x^2}{c^2}}$

then,

(219) $Fg_{rel} := \frac{\Phi'}{\Gamma} \cdot Press' \cdot \frac{\Phi'}{\Gamma}$ or, $Fg_{rel} = -9.861952433324145 \cdot \text{weber}^2 \cdot \text{Pa}$

where Φ' was defined previously by eq. (209), (215), and (216) and $Press'$ was defined by eq. (209) and (211).

Thus it can be postulated that the actual mechanics of gravitation that is hidden behind the veil of the contemporary understanding of gravitation contains the secret to a power source that is cleaner and by far more vast than fission or fusion power can ever expected to be. Perhaps the stars are just around the quantum corner.

Field Mass Generation and Control

Chapter 6

The famous two slit experiment proved that a particle can exist as a wave and yet still exhibit particle characteristics when the wavefunction is altered by an attempted measurement. Thus the wavefunction energy (potential) of the field can be said to convert directly to mass when the information in the wavefunction is changed. This is commonly referred to as wavefunction collapse which then removes the uncertainty of the position of the particle in question.

This chapter will expand on the concept of the mass equivalent in the quantum magnetic field and in particular, where that conversion from field energy to actual mass might yield a pondermotive force.

Also, the related concept in equation (220) on the next page is introduced wherein the electrostatic field energy is converted to field mass.

First, related constants are presented below.

$$\epsilon_0 := 8.854187817 \cdot 10^{-12} \cdot \frac{\text{farad}}{\text{m}} \quad \text{electrical permittivity of free space.}$$

$$q_0 := 1.602177330 \cdot 10^{-19} \cdot \text{coul} \quad \text{basic electronic charge.}$$

$$l_q := 2.817940920 \cdot 10^{-15} \cdot \text{m} \quad \text{classic electron radius.}$$

$$c := 2.997924580 \cdot 10^8 \cdot \frac{\text{m}}{\text{sec}} \quad \text{velocity of light in free space.}$$

$$\mu_0 := 1.256637061 \cdot 10^{-06} \cdot \frac{\text{henry}}{\text{m}} \quad \text{permeability of free space}$$

$$m_e := 9.109389700 \cdot 10^{-31} \cdot \text{kg} \quad \text{electron rest mass.}$$

Then the quantum electron electrostatic field energy is given as;

$$(220) \quad E_{\text{field}} := \frac{q_o^2}{4 \cdot \pi \cdot \epsilon_o \cdot l_q} \quad \text{or,} \quad E_{\text{field}} = 8.187111160863 \cdot 10^{-14} \cdot \text{joule}$$

The quantum electron field mass may be determined by dividing its electrostatic field energy by the speed of light squared, or;

$$(221) \quad M_{\text{field}} := \frac{E_{\text{field}}}{c^2} \quad \text{or,} \quad M_{\text{field}} = 9.109389692051423 \cdot 10^{-31} \cdot \text{kg}$$

This is exactly equivalent to an expression involving the magnetic permeability of free space instead of the electric permittivity of free space. This is shown below as;

$$(222) \quad M'_{\text{field}} := \frac{\mu_o \cdot q_o^2}{4 \cdot \pi \cdot l_q} \quad \text{or,} \quad M'_{\text{field}} = 9.109389688253174 \cdot 10^{-31} \cdot \text{kg}$$

Field mass is proportionally related to the magnetic field energy and if the magnetic field is in motion or flux, the field mass will follow proportionally to the magnitude of the field energy and thus be interpreted as an increase in magnetic flux. This field mass is basic to the electrogravitational field mass expression wherein mass = energy, or;

$$V_{\text{LM}} := 8.542454612 \cdot 10^{-02} \cdot \frac{\text{m}}{\text{sec}} \quad \text{and,} \quad m_e \cdot V_{\text{LM}}^2 = 6.647443298246635 \cdot 10^{-33} \cdot \text{joule}$$

then,

$$(223) \quad M_{\text{gravfield}} := \frac{m_e \cdot V_{\text{LM}}^2}{c^2}$$

$$\text{or,} \quad M_{\text{gravfield}} = 7.396278158407368 \cdot 10^{-50} \cdot \text{kg}$$

Once created, it may exist for all time as a least mass energy state and be additive over accumulated time. (Possibly an explanation of **cold dark matter**.)

The above analysis of electric field energy having a component magnetic field mass can be developed into a force field by moving the mass in some direction by allowing that field mass to acquire a rotational (V_{LM}) as well as vectored (V) velocity. The following equation will illustrate this concept.

$$(224) \quad F_{\text{field}} := \frac{M'_{\text{field}} \cdot V_{LM}^2}{l_q} \quad \text{or,}$$

then, $F_{\text{field}} = 2.358971844475206 \cdot 10^{-18} \cdot \text{newton}$

This quantum result can be expanded to include multiple field mass units and higher velocities.

Let $V := 1 \cdot 10^6 \cdot \frac{\text{m}}{\text{sec}}$

(This velocity would be the velocity of an electric field generated along a surface and the co-generated magnetic field-mass would travel with it which generates a real force field.)

$$(225) \quad F'_{\text{field}} := \frac{M'_{\text{field}} \cdot V_{LM} \cdot V}{l_q}$$

Then, $F'_{\text{field}} = 2.761468397106195 \cdot 10^{-11} \cdot \text{newton}$

Now let the field mass become influenced by the relativistic mass increase due to the force field approaching the velocity of light.

Let $V' := .9999999999999999 \cdot c$ Then,

$$(226) \quad M''_{\text{field}} := M'_{\text{field}} \cdot \left(1 - \frac{V'^2}{c^2}\right)^{-\frac{1}{2}} \quad \text{or,} \quad M''_{\text{field}} = 4.991413379158592 \cdot 10^{-23} \cdot \text{kg}$$

$$(227) \quad F_{\text{RelField}} := \frac{M''_{\text{field}} \cdot V_{\text{LM}} \cdot V}{I_{\text{q}}}$$

or, $F_{\text{RelField}} = 1.513123356794571 \cdot 10^{-3} \cdot \text{newton}$

where, $\frac{F_{\text{RelField}}}{F_{\text{field}}} = 6.414334110592964 \cdot 10^{14}$

This is a very large increase in force field units accomplished just by creating a switched series of point-charges across an insulated surface and that force field would keep on going after the electrostatic field race was terminated.

The electrogravitational field can be manipulated directly by the above force-field process since the components of the gravitational field are each special forms of the force field presented above.

First let the radius of interaction be set below as:

$$r_{n1} := 5.291772490 \cdot 10^{-11} \cdot \text{m} \quad \text{Then;}$$

$$(228) \quad F_{\text{gravfield}} := M'_{\text{field}} \cdot \frac{V_{\text{LM}}^2}{r_{n1}} \cdot \mu_o \cdot M'_{\text{field}} \cdot \frac{V_{\text{LM}}^2}{r_{n1}}$$

or for the quantum electrogravitational expression at the Bohr radius of Hydrogen,

$$F_{\text{gravfield}} = 1.982973075196837 \cdot 10^{-50} \cdot \text{newton}^2 \cdot \frac{\text{henry}}{\text{m}}$$

then substituting the expression for the relativistic force-field above;

$$(229) \quad F_{\text{rel gravfield}} := M'_{\text{field}} \cdot \frac{V_{\text{LM}}^2}{r_{n1}} \cdot \mu_o \cdot \frac{M''_{\text{field}} \cdot V_{\text{LM}} \cdot V}{r_{n1}}$$

or, $F_{\text{rel gravfield}} = 1.271945183662249 \cdot 10^{-35} \cdot \text{newton}^2 \cdot \frac{\text{henry}}{\text{m}}$

If the number of equivalent mass units are increased by boosting the number of charge units creating the force-field then the force field becomes quite large indeed. For instance a current of 1 amp would correspond to a multiplying factor of $1/q_0$.

The concept of charge-points being switched on can be extended to a design wherein the charge-points form a helix that has the distance between the charge-points equal to the fundamental quantum electrogravitational wavelength λ_{LM} , the distance between the helix turns would be equal to the radius of λ_{LM} and the general shape and length of the helix determined so as to allow for focusing the force field at a required point, (possibly a target), if necessary. (The helix turn radius becoming smaller with increasing helix length so as to allow the forward mass field momentum vector and the sideways mass field momentum vector to be brought to a beam of mass-field that would act directly on normal mass at some point distant. The action would be either one of repulsion or attraction according to the rotating phase in the beam in relation to the pulse rate of the switched E field that generates the mass-field beam. The degree of impact on the target would depend on the rise time of the switching pulse which is the same as saying the amount of step energy in each pulse of the mass-field beam. The quantum field-mass wavelength is defined below which is also the quantum electrogravitational wavelength.

Let Planks constant be stated: $h := 6.626075500 \cdot 10^{-34} \cdot \text{joule} \cdot \text{sec}$

Then,

$$(230) \quad \lambda_{LM} := \frac{h}{M_{\text{field}} \cdot V_{LM}} \quad \text{or,} \quad \lambda_{LM} = 8.514995423692462 \cdot 10^{-3} \cdot \text{m}$$

An ideal shape for controlling and generating the mass-field beam would be the shape common to many UFO shapes such as two Petri dishes joined at the edges to form a closed paraboloid surface. Then a computer controlled multiplexed switching system would energize surface dots in such a manner as to create not only helix patterns that would run from the outside edge towards the center but any pattern that was useful for whatever purpose. Thus not only would a form of swept or fixed focused electrogravitational propulsion be possible but tractor or repulsion beams could also be formed interspersed with the timing of the normal propulsion beam.

The surface of the craft would not be a conductor but a surface covered with conductive dots that would be spaced from each other the proper electrogravitational wavelength and of the proper square dimension each where each side of the square dot would correspond to the radius associated with the normal electrogravitational wavelength. Each dot would become electrically charged in its turn and then switched off at the proper time to accomplish the proper focusing of the mass-field beam.

The mass-field has the vectored direction realized by the contribution of the helix forward pattern velocity and the pattern radial velocity as well as the local system velocity relative to another system at rest in an inertial frame of reference.

Further consideration of field mass generation concerns the concept of translation of electrogravitational energy gained by a fall through the electrogravitational force field and that there exists the possibility of a latency involving the conversion of the kinetic energy gained by that fall to a rotational gain in energy corresponding to a time lapse equal to t_{LM} or the quantum electrogravitational period related to the inverse of the quantum electrogravitational frequency f_{LM} . The frequency and time are constructed in equation (231) below.

$$(231) \quad f_{LM} := \frac{M_{\text{field}} \cdot V_{LM}^2}{h} \quad \text{or, } f_{LM} = 10.03224803648295 \cdot \text{Hz}$$

$$t_{LM} := \frac{1}{f_{LM}} \quad \text{or, } t_{LM} = 0.099678556228218 \cdot \text{sec}$$

This energy conversion latency of linear to rotational inertia has been demonstrated by this author in an experiment recently performed. It can be postulated that any step change of energy may be converted to a probabilistic form of energy distribution involving a conversion of linear to rotational motion where as in the case of atomic fission, the final conversion result may be radiation at chance levels accompanied by rotation energies wherein the sum of the two equal the original energy step function.

Some of the radiation may induce rotational inertial forces in neighboring particles and at high enough levels, space-time itself may collapse in the direction of the main energy step location due to the relativistic velocities associated with adjacent particle participation in the main energy step function. This relativistic space-time compression due to a sudden increase of local mass-field was examined in the previous relativistic field equations (97) and (98) on pages 44 and 45.

If the rate of change of energy is fast enough as in a nearly ideal step function the impulse function generated is equivalent to a large change in mass which will start the relativistic increase in mass with the corresponding increase in implied velocity increase which further causes a reduction in the inertial radius which causes an increase in the apparent relative velocity, and so on. If strong enough initially, the impulse would cause the mass-field to go into imaginary space since the implied velocity would exceed the velocity of light and the craft that was generating the

mass-field would simply disappear from normal space-time.

There exists a motion picture of a previous atom bomb blast where the region around the epicenter of the blast appears to momentarily shrink for a small part of a second before the main blast takes over. It is postulated herein that this may be further evidence of the linear to rotational energy conversion latency being tied to a change in space-time which in this case is a fairly large scale example.

Proper control of this linear to rotational energy conversion function $f(t_{LM})$ may result in a form of propulsion that could take humanity to the stars.

ELECTROGRAVITATIONAL
CRAFT PROPULSION
AND CONTROL

Chapter 7

The purpose of this chapter is to present a most likely method of construction of a interstellar craft through the implementation of formulas contained herein that will illustrate a causal electrogravitational mechanism involving two-system inductive and capacitive interactions where the normal interaction at the receptor is the result of two cotangent functions based on constant phase angles and not on frequency. The actual phase angles for the normal electrogravitational force are developed and then the required phase change in the capacitive angle is developed that would allow for the counter electrogravitational action to occur that could have enormous force potential compared to either the usual normal or counter electrogravitational force.

There is no doubt for a great many people that craft from other than this world are not only here now but have been around for quite a while. The purpose of this paper is not to affirm or deny the existence of such craft but to present a possible working explanation as to how we humans might construct such craft for the exploration of space, thus advancing the general quality of life for all of humanity.

There is the possibility that we may not be welcome as we are since the races of interstellar space may consider us unfit due to rather backwards way of dealing with each other in general. I believe however that It is in our nature to give it a try at any rate.

If anyone reading this is willing to help fund the building of such a craft then I feel that I can contribute much towards the successful completion of such a task.

Let the following constants be stated for the purpose of computations regarding the further analysis of the electrogravitational formulas previously presented by this author.

$L_Q := 2.572983215822382 \cdot 10^3 \cdot \text{henry}$	Quantum Electrogravitational Inductance.
$C_Q := 3.86159328077508 \cdot 10^{-06} \cdot \text{farad}$	Quantum Electrogravitational Capacitance.
$R_Q := 2.581280560 \cdot 10^{04} \cdot \text{ohm}$	Quantum Hall Ohm.
$l_q := 2.817940920 \cdot 10^{-15} \cdot \text{m}$	Classic electron radius.
$r_{LM} := 1.355203611 \cdot 10^{-03} \cdot \text{m}$	Quantum Electrogravitational radius.
$\epsilon_o := 8.854187817 \cdot 10^{-12} \cdot \text{farad} \cdot \text{m}^{-1}$	Electrical permittivity of free space.
$\mu_o := 1.256637061 \cdot 10^{-06} \cdot \text{henry} \cdot \text{m}^{-1}$	Magnetic permeability of free space.
$f_{LM} := 1.003224805 \cdot 10^1 \cdot \text{Hz}$	Quantum electrogravitational frequency.
$t_{LM} := f_{LM}^{-1}$	Quantum electrogravitational time.
$r_{n1} := 5.291772490 \cdot 10^{-11} \cdot \text{m}$	Bohr n1 radius
$c := 2.997924580 \cdot 10^{08} \cdot \text{m} \cdot \text{sec}^{-1}$	Velocity of light in free space.
$v_{LM} := 8.542454612 \cdot 10^{-02} \cdot \text{m} \cdot \text{sec}^{-1}$	Quantum electrogravitational velocity.
$r_x := r_{n1}$	Variable r preset to Bohr n1 orbital radius.
$q_o := 1.602177330 \cdot 10^{-19} \cdot \text{coul}$	Basic electron charge.
$i_{LM} := q_o \cdot t_{LM}^{-1}$	Quantum electrogravitational current unit.

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

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

where then the previously established electrogravitational formula is stated again below as;

$$(232) \quad F_{eg} := \left(\frac{\mu_o \cdot q_o^2 \cdot v_{LM}^2}{4 \cdot \pi \cdot l_q \cdot r_x} \right) \cdot \mu_o \cdot \left(\frac{\mu_o \cdot q_o^2 \cdot v_{LM}^2}{4 \cdot \pi \cdot l_q \cdot r_x} \right)$$

$$\text{or,} \quad F_{eg} = 1.982973075196837 \cdot 10^{-50} \cdot \frac{\text{henry}}{\text{m}} \cdot \text{newton}^2$$

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.)

$$(233) \quad F'_{eg} := \left[\frac{L_Q \cdot (i_{LM}^2) \cdot A \cdot B}{r_x} \right] \cdot \mu_o \cdot \left[\frac{C_Q \cdot R_Q^2 \cdot (i_{LM}^2) \cdot A \cdot B}{r_x} \right]$$

$$\text{or,} \quad F'_{eg} = 1.982973070535905 \cdot 10^{-50} \cdot \frac{\text{henry}}{\text{m}} \cdot \text{newton}^2 \quad \text{also.}$$

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

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

$$\text{where;} \quad X_L = 1.621866424513917 \cdot 10^5 \cdot \text{ohm}$$

$$\text{and,} \quad X_C = 4.108235582859004 \cdot 10^3 \cdot \text{ohm}$$

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 equation (233) above with the proper phasor form of X_L and X_C we arrive at equation (234) next;

$$(234) \quad F''_{eg} := \left[\frac{X_L \cdot e^{j \cdot \left(\frac{\pi}{2}\right)} \cdot (i LM)^2}{\omega LM \cdot r_x} \cdot A \cdot B \right] \cdot \mu_o \cdot \left[\frac{R_Q \cdot [R_Q \cdot (i LM)^2]}{X_C \cdot e^{j \cdot \left(-\frac{\pi}{2}\right)} \cdot \omega LM \cdot r_x} \cdot A \cdot B \right]$$

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

$$F''_{eg} = -1.982973070535905 \cdot 10^{-50} + 2.428361421636938 \cdot 10^{-66} i \cdot \frac{\text{henry}}{\text{m}} \cdot \text{newton}^2$$

Note also that multiplying the source side of equation (234) above by X_L and dividing the receptor side by X_L , equation (235) is obtained where also the right side of equation (234) is the receptor portion of the interaction while the left side of the interaction is the source. Next we introduce equation (235) as:

(235)

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

where again;

$$F'''_{eg} = -1.982973070535905 \cdot 10^{-50} + 2.428361421636938 \cdot 10^{-66} i \cdot \frac{\text{henry}}{\text{m}} \cdot \text{newton}^2$$

The receptor side of equation (235) now contains two cotangent forms of R_Q/X_L and R_Q/X_C that represent two interaction angles that can be made independent of the angular frequency of the interaction. The cotangent ratios are ;

$$\frac{R_Q}{X_L} = 0.159154941552824$$

$$\frac{R_Q}{X_C} = 6.283185343046065$$

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

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

$$\phi' = 80.9569390069661 \cdot \text{deg}$$

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

$$\phi'' = 9.043061028269946 \cdot \text{deg}$$

Check;

$$\cot(\phi') = 0.159154941552824$$

$$\cot(\phi'') = 6.283185343046065$$

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. Equation (235) previous may now be put in the form of equation (236) below where the cotangent ratios may be expressed as angles.

(236)

$$F'''_{eg} := \left[\begin{array}{c} \text{Source} \\ \frac{X_L \cdot e^{j \cdot \left(\frac{\pi}{2}\right)} \cdot (i_{LM})^2 \cdot A \cdot B}{\omega_{LM} \cdot r_x} \end{array} \right] \cdot \mu_o \cdot \left[\begin{array}{c} \text{Receptor} \\ \frac{\cot(\phi') \cdot \cot(\phi'') \cdot X_L \cdot e^{j \cdot \left(\frac{\pi}{2}\right)} \cdot (i_{LM})^2 \cdot A \cdot B}{\omega_{LM} \cdot r_x} \end{array} \right]$$

Please note that the phasor form for reactance yields the real (-) force of attraction.

$$F'''_{eg} = -1.982973070535903 \cdot 10^{-50} + 2.428361421636936 \cdot 10^{-66} i \cdot \frac{\text{henry}}{\text{m}} \cdot \text{newton}^2$$

It must be emphasized that now the normal sign 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

is controlled in the receptor by the phase angles ϕ' and ϕ'' which may be altered. 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 that has a series of conductive dots etched upon that insulating surface that form a transmission line type of surface 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.

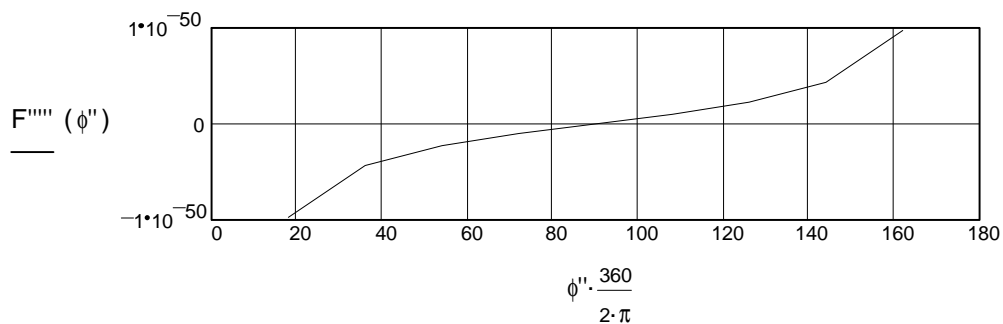
Let equation (236) be restated for the purpose of experimenting with the value of ϕ'' to see what the effect is on the normal negative vector force F_{eg} .

Let $\phi'' := .1 \cdot \pi, .2 \cdot \pi \dots 0.9 \cdot \pi$ Then,

(237)

<p>Source</p> $F''''(\phi'') := \left[\frac{X_L \cdot e^{j \cdot \left(\frac{\pi}{2}\right)} \cdot (i LM)^2 \cdot A \cdot B}{\omega LM \cdot r_x} \right] \cdot \mu_o \cdot$	<p>Receptor</p> $\left[\frac{\cot(\phi') \cdot \cot(\phi'') \cdot X_L \cdot e^{j \cdot \left(\frac{\pi}{2}\right)} \cdot (i LM)^2 \cdot A \cdot B}{\omega LM \cdot r_x} \right]$
---	---

We can graph the plot for $F''''(\phi'')$ in equation (237) above in plot. #8 below;



If we select an angle for ϕ'' a little less than π (or 180 degrees), the result may be interesting indeed. Let equation (237) be restated again in (238) next.

Let $\phi'' := 179.9999999999999857 \cdot \text{deg}$

$$(238) \quad \begin{array}{ccc} & \text{Source} & \text{Receptor} \\ F_{\delta g} := & \left[\frac{X_L \cdot e^{j \cdot \left(\frac{\pi}{2}\right)} \cdot (i LM)^2 \cdot A \cdot B}{\omega_{LM} \cdot r_x} \right] \cdot \mu_o \cdot & \left[\frac{\cot(\phi') \cdot \cot(\phi'') \cdot X_L \cdot e^{j \cdot \left(\frac{\pi}{2}\right)} \cdot (i LM)^2 \cdot A \cdot B}{\omega_{LM} \cdot r_x} \right] \end{array}$$

Or the new (+) real vector force of repulsion is:

$$F_{\delta g} = 2.57715439257088 \cdot 10^{-35} - 3.155999643923548 \cdot 10^{-51} i \cdot \frac{\text{henry} \cdot \text{newton}^2}{\text{m}}$$

Any attempt to minimize the above result for the sake of being conservative is just not possible. This is a very exciting result! It is not the magnitude of the force that determines the control of anti-gravity but the finesse of phase control alone that determines the possibly huge resultant force. This is by reason of the nature of the cotangent function that just below 180 degrees approaches (+) infinity while just beyond 180 degrees the function pops through from (+) infinity to (-) infinity and then begins to rise from (-) infinity towards zero again. This demands that the control must be very stable and capable of ultra fine adjustment, else the craft may well experience an infinitely large (+) to (-) force almost instantly if the phase were to be actual pass through 180 degrees. The result could be catastrophic.

Perhaps the tremendous stellar radiators in deep space may be related to an ongoing process of releasing energy from hyperspace due to the above action. Even the explosion at Tunguska in Russia may have occurred by reason of a limited form of the above action. This may have been connected to a UFO type craft that lost phase control of its electrogravitational field generator and blew up. Or perhaps an experiment that someone was doing along those lines failed.

Note:

The normal negative force sign is arrived at naturally through the phasor expressions related to the X_L terms and when the source and receptor phasor terms in X_L are multiplied the result is a (-1) expression which also represents a reaction force of 180 degrees. This would explain why the force of gravity is normally one of attraction.

or;

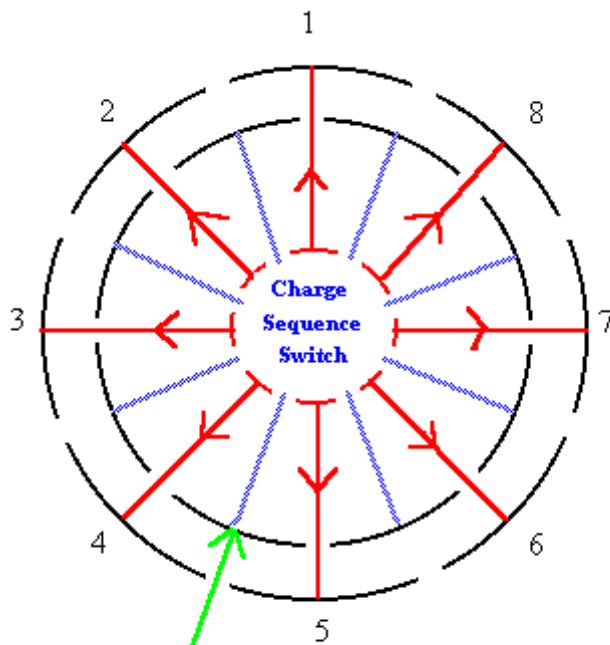
$$(239) \quad \left[e^{j \cdot \left(\frac{\pi}{2} \right)} \right]^2 = -1 + 1.224606353822377 \cdot 10^{-16} i$$

Also it should have been noted by the reader that the sign of the force in equation (238) previous changed to a repelling force as well as increasing by an order of 15 in magnitude when the phase of ϕ'' was allowed to approach 180 degrees. If poorly controlled this could easily unleash forces oscillating from (+) to (-) in infinite strength resulting not only in the destruction of the craft but of the immediate surroundings, perhaps for quite a radial distance.

The concept of a charged spherical body rotating around a central axis creating a magnetic field is well established empirically so the concept of a sequentially charged series of dots (in a circular fashion) follows naturally in its ability to form a resultant magnetic field much like rotating charged spherical body. The concept concerning the sequentially charged dots however departs from the normal in a very dramatic way. The dots can be charged sequentially at a rate greatly exceeding the equivalent velocity of light in free space. Therefore the craft surrounded by such a field would simply disappear from our normal space and slip quickly in hyperspace. In hyperspace, "everywhere" is at the same place. The concept of velocity or distance has no meaning. The design for creating that type of switching action

follows naturally if we consider the case of sending out a pulse of electrical energy to charge to the perimeter of a semicircle of dots from a point slightly offset from the center of the dots.

Figure #6 below illustrates the above field generation concept pictorially.



Inner segments are the groundplane for the outer segments.

The charge sequence switch charges each outer conductive segment in order and if the velocity at the switch is $v = c$ around the perimeter of the switch, the outer segment linear velocity will be $v > c$. This is not to scale as the actual construction will continually branch for demultiplexing and thus properly sequencing the charge. The outer conductor segments will be of the dimensions of λ_{LM} . The discharge sequence is the reverse in sequence and charge polarity.

Each of the surface-charged conductive dots would have the dimensions equal to the electrogravitational wavelength in the perimeter dimensions equal to l_{LM} . These dots and their connecting strip-lines could be grown much as the VLSIC microcircuit technology of today fabricates large scale integrated circuits. The demultiplexing would be under the control of parallel microprocessors which all would be controlled by a master control processor with redundant control processors as backup. The latest in diamond surface vapor deposited construction would allow for the surface to be very durable as well as provide the best in electrical insulation between the outer

surface and the underlying ground plane conductive surface. The control features would allow for onboard control to suit the requirements of the operator. The required inductance is formed by the virtual current rotation and the way that the field is formed by the charged surface dots. The capacitance is formed and varied by the varactor deposit between the ground plane and the surface dots. The below formula relates the inductance as a function of the generated field flux to the current that produces the flux.

$$(240) \quad L = \frac{\Delta\Phi}{\Delta i} \quad \text{where} \quad \Delta\Phi = \Delta B \cdot \text{Area}$$

The preceding has presented the basic requirements for the generation of a counter- electrogravitational field as well as a mass-field generation system. Such a system could also be used for power generation through offset mass-fields interacting directly with the gravitational field of our planet or some other planet.

The nature of the shape of the electrogravitational field is of interest also. Figure #7 below presents the Boit-Savart pictorial of the mechanics of generating a B-field vector as is most commonly understood today.

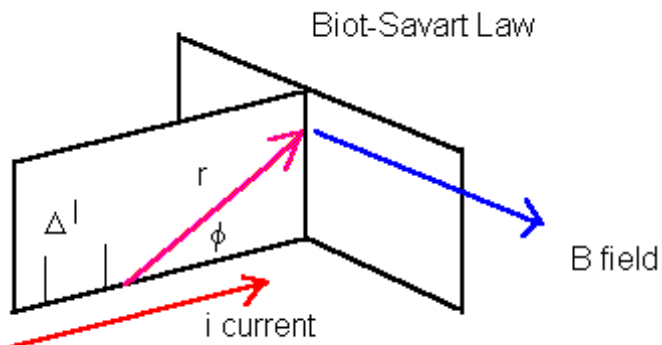


Fig. #7

The current is composed of (+) charge carriers. In the actual mechanics of B field generation, ϕ is the angle ϕ' between the current (i) and interaction radius (r). See page 123.

Now if we let the current be circular instead of in a straight line the variable distance parameter (r) must form a spiral in order to hold the phase angle ϕ a constant. This forms the natural spiral based on the natural number (e).

Also, the phase angles ϕ' and ϕ'' are independent of frequency but should be held constant in relation to the R / XL and R / XC cot relationships. Then the virtual current pattern formed by the ordered sequencing of the charging dots is that of a spiral with a fixed geometric shape based on the rate of spiral growth (a) being equal to the cotangent of the angle ϕ' . This is shown in plot #9 below.

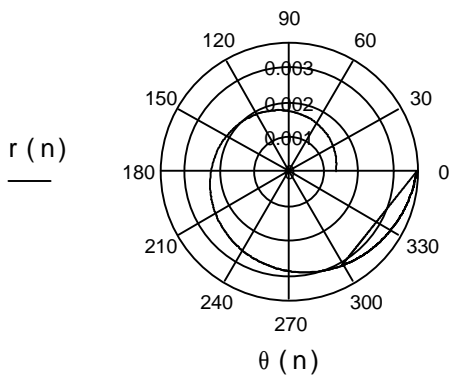
or, $a_L := \cot(\phi')$ where $a_L = 0.159154941552824$

Now let $n := 0, 1 \dots 360$ $\theta(n) := \frac{2 \cdot \pi \cdot n}{360}$

$r'_{LM} := 1.355203611 \cdot 10^{-3}$ $a_L := \cot(\phi')$

The spiral is derived as; $r(n) := e^{a_L \cdot \theta(n)} \cdot r'_{LM}$

Plot #9



The natural spiral nature of the curve at the left is readily apparent. This is the pattern of the conductive dot charging sequence on the craft surface based on the spiral growth rate of the cotangent of ϕ' . The spiral may also be repeated as offset in time either CCW or CW in rotational aspect from zero.

The B-field vector associated with the virtual current charge pattern above is out towards the viewer at the velocity of light in free space. The rate of change of flux and virtual current is dependent on the rate of charge sequencing which can be made

nonlinear if desired, or to even change polarity and discharge backwards if desired. Then any value of virtual inductance at the required frequency or repetition rate is possible.

If a three dimensional view is constructed it would look something like plot #10 next (where the drawing is not to scale) so that the general idea of how the 3-D B-field is generated around the spiral in plot #9. The spiral is at the center of the expanding shell.

Let the following parameters be stated for plot #10 next.

$$N := 20 \quad m := 0..N \quad n := 0..N \quad R := 1 \quad r_n := e^{aL \cdot \frac{n}{N} \cdot 2 \cdot \pi}$$

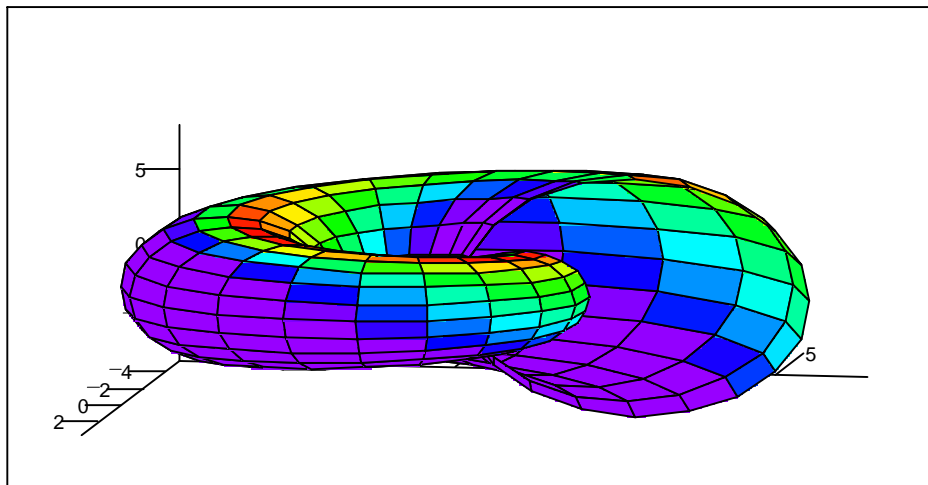
$$\phi_m := \frac{2 \cdot \pi \cdot m}{N} \quad \theta_n := \frac{2 \cdot \pi \cdot n}{N} \quad \Phi_m := \frac{2 \cdot \pi \cdot m}{N}$$

$$X_{m,n} := \left(R + r_n + r_n \cdot \cos(\phi_m) \right) \cdot \cos(\theta_n)$$

$$Y_{m,n} := \left(R + r_n + r_n \cdot \cos(\phi_m) \right) \cdot \sin(\theta_n) \quad Z_{m,n} := (3 \cdot r)_n \cdot \sin(\Phi_m)$$

Only the upper half above the ground plane is relevant to the expansion of the field.

Plot #10



X, Y, Z

The actual construction of a craft as described above could be done with present day technology and the methods of construction as to shape and size are practically unlimited. As with any new design there would undoubtedly be many changes in the original design as empirical data allowed for the improvement as the construction progressed through many stages of building and testing.

There is something very profound in the natural spiral and its meaning in creation. It speaks to our fundamental natural being as something new and yet at the same time very familiar. It is then not too much of a stretch to postulate the force of gravity to be intimately intertwined in the natural spiral form throughout space and time.

Suppose we discuss the operation by human beings of such a craft and consider whether or not they could survive the fields and hyperspace stresses a craft like the above could impose. As we are presently constructed, likely we could not either in the short or long haul endure the intense G-forces or the electric and magnetic fields. If we managed to build in shields and force fields to alleviate these stresses, we still have the problem of eating and elimination of body waste. A modified construct where the requirement of eating and eliminating body waste could be implemented by genetic engineering. Some form of energy input would take the place of eating with no waste product other than perhaps heat. Other changes such as the elimination of sex organs may be necessary since the need to replicate would be handled in other ways such as a central genetic engineering facility somewhere. In other words, the occupant would have to be engineered to fit the job since regular human beings could not handle the stress of such demanding flight requirements. Finally, the element of loyalty would have to be built in to such a degree that would guarantee that the pilot would not disobey or harm the people it was supposed to

defend. Such a craft would by the nature of its construction be capable of great destruction, what with the ability to project and pinpoint mass-fields over great distances.

Perhaps the local Earth phenomena called crop-circles are messages reminding us of that fact. They also however show a great deal of creativity and are undoubtedly a language built on symbolic communications, or communication through the use of pictorial symbols.

THE FLUXOID QUANTUM AND
ELECTROGRAVITATIONAL
DYNAMICS

Chapter 8

This work extends chapter 6 titled, "Field Mass Generation and Control", while also developing a new conceptual approach to mass-field vehicle control utilizing the invariance of the electric and magnetic forms of the Fluxoid Quantum in the Lorentz transforms which are an integral part of Einstein's Special Theory of Relativity.

This is a direct application of the principle that if a process may be made reversible then the cause may be invoked by reversing the effect. In other words, a velocity increase may be made to occur by invoking a relativistic time increase by linking that action through a mechanism involving (in this case) the invariant quantum fluxoid constant in its electrical form and an increase in time of that electrical parameter through a lowering (in step fashion) of its interaction frequency.

First let the following pertinent parameters be introduced for the purpose of running the active Mathcad forms of this book.

$q_o := 1.602177330 \cdot 10^{-19} \cdot \text{coul}$	Electron charge.
$\epsilon_o := 8.854187817 \cdot 10^{-12} \cdot \text{farad} \cdot \text{m}^{-1}$	Electric permittivity of free space.
$\mu_o := 1.256637061 \cdot 10^{-06} \cdot \text{henry} \cdot \text{m}^{-1}$	Magnetic permeability of free space.
$V_{n1} := 2.187691417 \cdot 10^{06} \cdot \text{m} \cdot \text{sec}^{-1}$	Bohr n1 orbital velocity of Hydrogen.
$m_e := 9.109389700 \cdot 10^{-31} \cdot \text{kg}$	Electron rest mass.
$r_{n1} := 5.291772490 \cdot 10^{-11} \cdot \text{m}$	Bohr radius of n1 orbital.
$l_q := 2.817940920 \cdot 10^{-15} \cdot \text{m}$	Classic electron radius.

$r_{LM} := 1.355203611 \cdot 10^{-03} \cdot m$	Quantum Electrogravitational radius.
$t_{n1} := 1.519829860 \cdot 10^{-16} \cdot sec$	Bohr n1 orbital time.
$v_{LM} := 8.542454612 \cdot 10^{-02} \cdot m \cdot sec^{-1}$	Quantum electrogravitational velocity.
$i_{LM} := 1.607344039 \cdot 10^{-18} \cdot amp$	Quantum electrogravitational current.
$R_Q := 2.581280560 \cdot 10^{04} \cdot ohm$	Quantum Hall ohm.
$c := 2.997924580 \cdot 10^{08} \cdot m \cdot sec^{-1}$	Velocity of light in free space.
$\Phi_o := 2.067834610 \cdot 10^{-15} \cdot weber$	Fluxoid Quantum.
$f_{LM} := 1.003224805 \cdot 10^{01} \cdot Hz$	Quantum electrogravitational frequency.
$t_{LM} := f_{LM}^{-1}$	Quantum electrogravitational time.
$h := 6.626075500 \cdot 10^{-34} \cdot joule \cdot sec$	Planks constant.

The electric potential at the Bohr (n1) radius is given by;

$$(241) \quad E_{n1} := \frac{q_o}{4 \cdot \pi \cdot \epsilon_o \cdot r_{n1}} \quad \text{or,} \quad E_{n1} = 27.2113960948673 \cdot \text{volt}$$

And let;

$$(242) \quad \Phi_{oE} := E_{n1} \cdot \frac{t_{n1}}{2} \quad \text{or,} \quad \Phi_{oE} = 2.067834615863336 \cdot 10^{-15} \cdot \text{weber}$$

Also the same quantum magnetic flux is arrived at by (244) below: Let $\theta := \frac{\pi}{2}$

$$(243) \quad \Phi = B(\text{tesla}) \quad x \quad \text{Area}$$

and,

$$(244) \quad \Phi_{oM} := \left(\frac{\mu_o \cdot q_o}{4 \cdot \pi \cdot l \cdot q \cdot r_{n1}} \cdot v_{LM} \sin(\theta) \right) \cdot \pi \cdot r_{LM} \cdot r_{n1}$$

$$\text{or,} \quad \Phi_{oM} = 2.067834617261025 \cdot 10^{-15} \cdot \text{weber}$$

where the ratio

$$\frac{\Phi_{oE}}{\Phi_{oM}} = 0.999999999324081$$

(Then the electric fluxoid through time and the magnetic fluxoid through time are connected to each other by the Fluxoid Quantum constant and one must necessarily generate the other.)

There is a constant radius related to the least quantum volt as derived from the Quantum Fluxoid as;

$$(245) \quad E_{LM} := i_{LM} R_Q \quad \text{or,} \quad E_{LM} = 4.149005921102582 \cdot 10^{-14} \cdot \text{volt}$$

then;

$$(246) \quad r_{qLM} := \frac{q_o}{4 \cdot \pi \cdot \epsilon_o \cdot E_{LM}} \quad \text{or,} \quad r_{qLM} = 3.470626940706936 \cdot 10^4 \cdot \text{m}$$

This radius can be equated to a wavelength by:

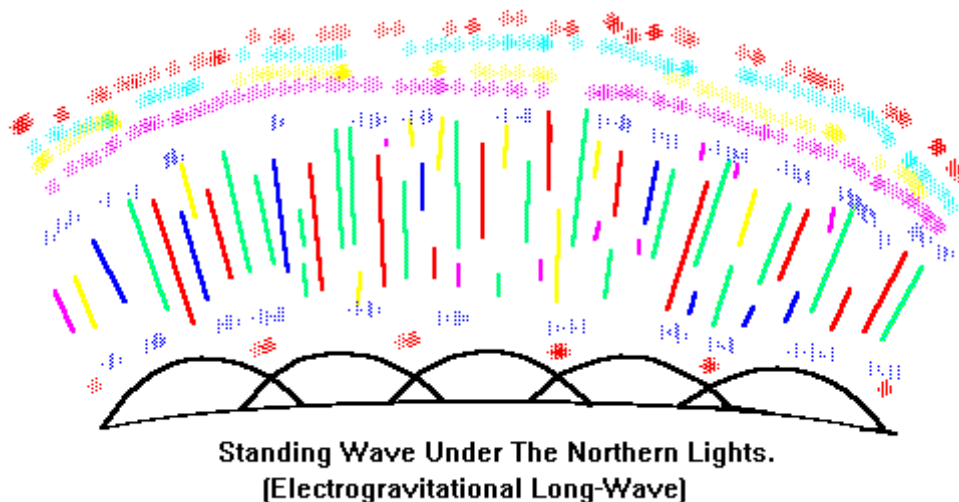
$$(247) \quad \lambda_{qLM} := 2 \cdot \pi \cdot r_{qLM} \quad \text{or,} \quad \lambda_{qLM} = 2.180659220055146 \cdot 10^5 \cdot \text{m}$$

which of course will have an associated frequency of;

$$(248) \quad f_{qLM} := \frac{c}{\lambda_{qLM}} \quad \text{or,} \quad f_{qLM} = 1.374779035820272 \cdot 10^3 \cdot \text{Hz}$$

This frequency may well be the whistler frequency associated with the low frequency waves attributed to lightning storms which could act as an amplifying stimulus. Also, there are in existence photographs of some ionized curved semicircles at the Earth's poles that were taken some time back. These may serve also to illustrate the long electrogravitational wavelength associated with equation (247) above. This is reproduced from memory below in figure #8.

Fig. #8



Again, Figure #8 on page 135 previous is an approximate drawing of the photographed standing waves that have been observed over the North Pole at various times. It is this authors postulate that they are evidence of the electrogravitational long-wave of equation (247) above along with the well known whistlers that are associated with high energy lightening stimulus.

Since there exist magnetic domains it is not unreasonable to propose the existence of electrogravitational domains as well. The size of these domains would depend on the local transfer impedance of the surrounding medium. A good example would be the plasma at the photosphere of our Sun which is composed of a layer of granules and supergranules about 60 miles thick where also a granule is larger than the size of Texas and the underlying supergranule is twice Earth's diameter. If we let the quantum resistance portion of equation (245) on the previous page be lowered, then the result would be an increase in the wavelength of equation (247) thus enlarging the domain. This is not unreasonable since the resistance to current flow should decrease as the number of charge carriers increases per unit volume. It is then also possible to propose that different pressures in the plasma could cause chaos and thus solar flares whose domain (or loop size) would depend on the temperature and pressure in the local plasma. Even the storm cells on Earth could be attributed to the electrogravitational domain principle.

The electric and magnetic fluxoid constants being equal to the Fluxoid Quantum will allow for some interesting field consequences which will be shown by the following formulas on the next page.

First we will solve for r_d with the expression employing the Fluxoid Quantum in equation (249) next.;

$$(249) \quad r_d := \frac{q_o}{4 \cdot \pi \cdot \epsilon_o \cdot (2 \cdot \Phi_o) \cdot f_{LM}} \quad \text{or,} \quad r_d = 3.470626919228714 \cdot 10^4 \cdot \text{m}$$

which is the same long-wave radius as obtained in equation (246). If we allow for f_{LM} to become a variable then r_d will change inversely as the frequency changes. This change of frequency will necessitate the changing of L_Q and C_Q at the interface so that the interaction angles ϕ' and ϕ'' may be held constant. (See the previous chapter 7, page 123.) The holding of the quantum electric fluxoid as a constant is illustrated below

Assume that r_d is increasing then; let $t_d := t_{LM}$

volts(down) x time(up)

$$(250) \quad \Phi_{oE} := \left(\frac{q_o}{4 \cdot \pi \cdot \epsilon_o \cdot r_d} \right) \cdot \left(\frac{t_d}{2} \right) \quad \text{or,} \quad \Phi_o = 2.06783461 \cdot 10^{-15} \cdot \text{weber}$$

Thus the quantum electric fluxoid above and the quantum magnetic fluxoid in equation (244) are constants as is the standard Fluxoid Quantum below;

$$\Phi_o = 2.06783461 \cdot 10^{-15} \cdot \text{weber}$$

The quantum magnetic fluxoid may be further developed by simplifying equation (244) so that;

$$\left(\frac{\mu_o \cdot q_o}{4 \cdot \pi \cdot l_q \cdot r_{n1}} \cdot v_{LM} \cdot \sin(\theta) \right) \cdot \pi \cdot r_{LM} \cdot r_{n1}$$

simplifies to

$$\frac{1}{4} \cdot \mu_o \cdot \frac{q_o}{l_q} \cdot v_{LM} \cdot \sin(\theta) \cdot r_{LM}$$

where now;

$$(251) \quad \Phi_{oM} := \frac{1}{4} \cdot \mu_o \cdot \frac{q_o}{l_q} \cdot v_{LM} \cdot \sin(\theta) \cdot r_{LM}$$

$$\text{or;} \quad \Phi_{oM} = 2.067834617261025 \cdot 10^{-15} \cdot \text{weber}$$

Note that the expression for the the quantum magnetic fluxoid above in equation (251) is obtained from constants only. No variables are involved. (This holds the parameters v_{LM} and r_{LM} constant at the point of interaction.)

It is of interest that the Fluxoid Quantum is much like the Plank constant (h) wherein Heisenbergs two most famous expressions involve the uncertainty principle such that the uncertainty in particle momentum times the uncertainty in its position will be equal to Planks constant h and also the uncertainty of the energy of a particle times the uncertainty in the time of that particle also is equal to Planks constant. The Fluxoid Quantum (and thus the quantum electric and magnetic fluxoid developed in this paper above) have a similar form wherein the variable volts times the variable time equals the quantum electric fluxoid and the variable flux density (B_Q) times the variable area equals the quantum magnetic fluxoid and both of these are equal to the standard Fluxoid Quantum. It is of further interest that the Fluxoid Quantum may be derived directly in terms of Planks constant and the basic electron charge as in equation (252) below.

$$(252) \quad \Phi'_o := \frac{h}{(2) \cdot q_o} \quad \text{or;} \quad \Phi'_o = 2.067834619779572 \cdot 10^{-15} \cdot \text{weber}$$

$$\text{and then the ratio is;} \quad \frac{\Phi'_o}{\Phi_o} = 1.000000004729378$$

Note that the equation in (252) previous requires that two basic electron charges must be used which implies that electrons naturally exist in pairs when the Fluxoid Quantum is involved and this may be applied directly to all of the electrogravitational equations as well as the case for the mechanism of superconductivity. This may also state the case for the natural generation of electron pairs by a free field as well.

The quantum electric fluxoid being held constant allows for a variable distance from the interface to a target mass to be achieved by causing an increase in t_d through a relativistic effect. The charging sequence of dots on the surface of the electrogravitational interface can be charged at a surface velocity approaching the velocity of light. The time displacement can be likened to a method of producing time dilation as in the relativistic time dilation in Einstein's special theory of relativity and the distance projection would occur as for the case of the mu-meson that is traveling at near light speeds wherein the decay time is lengthened relativistically which causes the mu-meson to travel much farther through the atmosphere than would otherwise be the case before it decays. (This gives the appearance that the mu-meson is traveling faster than the velocity of light if the relativistic time dilation is not taken into account.)

This is demonstrated by equation (250) where by forcing the volts down will require r_d to increase and thereby also require t_d to increase. This relativistic type of effect can therefore be mimicked by the sudden change of t_d to a larger t'_d value.

This is then simply a change in the frequency of the interaction field of the electrogravitational control surface from a higher to a lower value. Then the Lorentz transform involving the relativistic increase of time t'_d would invoke the relationship of $d'' = c \times t'_d$. This would force r_d to increase in proportion to the frequency decrease

along the vectored phase angle. (See equation (250) of this paper.) This is predicated upon the quantum fluxoids F_o , F_{oE} , and F_{oM} all being constants even in the relativistic case.

There also exists the possibility of the virtual relativistic action being forced into imaginary space where if the linear velocity of the dot charging sequence be allowed to exceed the velocity of light then the craft behind that interface would no longer be in our normal space but would be outside the world-line light cone in a region defined as present but elsewhere, a region that may be connected to all points in our space at once. The entire craft would then become invisible to our space.

Related to this chapter and included with this book is a stand alone executable file named SPIRALLY.EXE that dynamically illustrates the dot charging sequence action that is the same as described in the previous chapter 7 titled "Electrogravitational Craft Propulsion and Control". The sequence of spiraling dots made by electrons striking the phosphor surface of a CRT contain the basic frequency independent interaction angles ϕ' and ϕ'' which are developed on page (123) of that paper. A suitable detector mounted in front of that CRT may be able to pick out the frequencies connected with that electrogravitational action spiral.

This file may be run from the DOS prompt or from the file manager in windows. It should again be noted that a video screen is much like the dot charging surface described in the previous text and thus under the right circumstances could simulate that surface quite closely which makes experimentation easily available to all concerned. The program may be slow on some older machines but the program could be vastly speeded up by writing the program in machine language. The program as it is was written under Microsoft Basic's PD7 development system and

then was compiled into an EXE self executable file by this author.

When the electrogravitational interface frequency is changed to effect a change in r'_d there exists the requirement of holding either one or both of the interaction phase angles ϕ' and ϕ'' constant or controllable to a required phase for the proper control of the spacecraft. Therefore the inductance L_Q and the capacitance C_Q should be variable and controllable. Or,

$$\text{constant } X_{LQ} = 2 \cdot \pi \cdot \Delta f_Q \cdot \Delta L_Q$$

and,

$$\text{constant } X_{CQ} = \frac{1}{2 \cdot \pi \cdot \Delta f_Q \cdot \Delta C_Q}$$

The above equations can be expressed as numerical values by setting Δf_Q to be equal to f_{LM} , ΔL_Q equal to L_Q , and ΔC_Q equal to C_Q . Also the net impedance constant may be solved for as follows:

let; $L_Q := 2.572983215822382 \cdot 10^{03}$.henry and $C_Q := 3.86159328077508 \cdot 10^{-06}$.farad

then;

$$(253) \quad X_{LQ} := 2 \cdot \pi \cdot f_{LM} \cdot L_Q \quad \text{or,} \quad X_{LQ} = 1.621866424513917 \cdot 10^5 \cdot \text{ohm}$$

constant

$$(254) \quad X_{CQ} := \frac{1}{2 \cdot \pi \cdot f_{LM} \cdot C_Q} \quad \text{or,} \quad X_{CQ} = 4.108235582859004 \cdot 10^3 \cdot \text{ohm}$$

constant

$$(255) \quad Z_{\text{total}} := \sqrt{R_Q^2 + (X_{LQ} - X_{CQ})^2}$$

or;

$$Z_{\text{total}} = 1.601720439122782 \cdot 10^5 \cdot \text{ohm}$$

constant

Thus while the frequency is being changed to affect a change in the spacecraft's

coordinates, the inductance and capacitance must change to keep control over the interface impedance and thus the interaction phase angle at the spacecraft's electrogravitational interface.

The quantum inductance L_Q may be derived directly from the relationship that states that a change in field flux divided by a change in initiating current defines the related inductance. This is shown below for the quantum electrogravitational parameters as previously derived.

$$(256) \quad L_{QE} := \frac{\left(\frac{2 \cdot q_o}{4 \cdot \pi \cdot \epsilon_o \cdot r_d} \right) \cdot \left(\frac{t_d}{2} \right)}{i_{LM}} \quad \text{or,} \quad L_{QE} = 2.572983206864028 \cdot 10^3 \cdot \text{henry}$$

Again, $t_d = t_{LM}$ and $i_{LM} = q_o / t_{LM}$.

If we now let the least quantum electrogravitational distance r_{LM} be substituted for r_d and then solve for t_d , the result is interesting when compared to the related frequencies f_{M1rn1} and f_{Cm1} in the previous chapter titled "Electrogravitational Dynamics", on pages 67 and 68.

or,

$$(257) \quad L_{QE} := \frac{t_d \cdot t_{LM}}{4 \cdot \pi \cdot \epsilon_o \cdot r_d} \quad \text{or,} \quad L_{QE} = 2.572983206120198 \cdot 10^3 \cdot \text{henry}$$

which is the electrogravitational quantum inductance as previously derived in previous papers by this author.

Then solving for t_d as t_{new} when $r_d = r_{LM}$ in equation (257) previous;

$$(258) \quad t_{new} := \frac{L_{QE} \cdot 4 \cdot \pi \cdot \epsilon_o \cdot r_{LM}}{t_{LM}} \quad \text{or,} \quad t_{new} = 3.892228761591022 \cdot 10^{-9} \cdot \text{sec}$$

$$\text{and} \quad f_{new} := \frac{1}{t_{new}} \quad \text{or,} \quad f_{new} = 2.569222060810298 \cdot 10^8 \cdot \text{Hz}$$

This frequency is extremely close to the frequencies f_{M1rn1} and f_{C1rn1} mentioned above, where also;

$$f_{M1rn1} := 2.569221969458471 \cdot 10^{08} \cdot \text{Hz}$$

$$f_{C1rn1} := 2.569222069780951 \cdot 10^{08} \cdot \text{Hz}$$

or, $f_{\text{new}} - f_{M1rn1} = 9.135182738304138 \cdot \text{Hz}$

and, $f_{C1rn1} - f_{\text{new}} = 0.897065281867981 \cdot \text{Hz}$

The frequency (f_{new}) is likely to be a universal quantum frequency that is to be associated with the electrogravitational field action in general. It therefore may be expected to be connected with all manner of energy quanta and detectable by various experimental methods. Associated with this frequency should be the quantum electrogravitation frequency f_{LM} as perhaps a sideband mix connected to f_{new} . For example, an experiment utilizing a phase-lock loop centered on random energy-related frequencies may detect one or the other or both at the same time.

The Cross-Product and the
Electrogravitational Action

Chapter 9

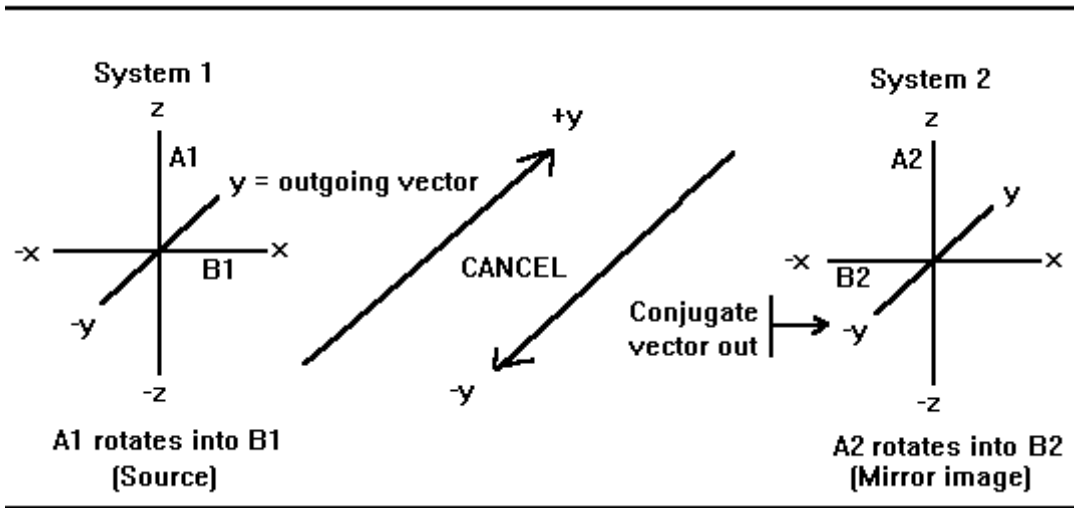
This chapter presents yet another form of the electrogravitational mechanics action via the cross-product method. The interaction between two force systems normally will occur only when their vectors of current action are pointed at each other. This is guaranteed to occur by reason of the simultaneous collapse of their interacting wavefunctions. Thus the net result will be a force of attraction between the systems of quantum currents. Otherwise, the position of the quantum current vectors in any system is unknown and completely random during the inaction time.

The concept of wavefunction collapse will be examined in greater detail in the next chapter where the concept of all matter interacting with (and being sensitive to) the presence of all other matter in the universe will also be presented. This will be another way of explaining the previously presented concept of the least quantum classic radius being tied directly to all other least quantum radii through imaginary energy space which is one point connected to all of our normal space.

The vector cross-product is presented below in figure #9 as it pertains to the sign of the gravitational force where attraction is defined as a (-) sign and repulsion is thus defined as a (+) sign.

The System 1 action is a rotation of z into x that generates a vector to the right, (+y), towards the action of System 2. System 2 is a mirror image with a conjugate vector, (-y), of the action axis and rotation so that the generated System 2 vector has a vector that cancels the System 1 vector in conjugate fashion. Please refer to the figure immediately below this text which attempts to clarify this concept.

Figure #9



System 1, rotation is Z into X

System 2, rotation is Z into -X

(259) $A1 := \begin{pmatrix} 0 \\ 0 \\ 1 \end{pmatrix} \quad B1 := \begin{pmatrix} 1 \\ 0 \\ 0 \end{pmatrix}$

(260) $A2 := \begin{pmatrix} 0 \\ 0 \\ 1 \end{pmatrix} \quad B2 := \begin{pmatrix} -1 \\ 0 \\ 0 \end{pmatrix}$

Vector cross-product of system 1 is:

Vector cross-product of system 2 is;

(261) $Sys1 := A1 \times B1$

(262) $Sys2 := A2 \times B2$

$$Sys1 = \begin{pmatrix} 0 \\ 1 \\ 0 \end{pmatrix}$$

$$Sys2 = \begin{pmatrix} 0 \\ -1 \\ 0 \end{pmatrix}$$

The total product of system 1 and 2 will yield the sign of the unit-scale electrogravitational action as:

(263) $F_{g1} := Sys1 \cdot Sys2 \quad \text{or,} \quad F_{g1} = -1$

which is defined as a force of attraction by standard convention. The total interaction is independent of a preferred choice of axis or system since the reaction is always the conjugate of the action system. The result is always attraction.

The vector cross-product in system 1 on page 145 previous may be oriented starting with z, x, -z, or -x for A1 as long as the right hand rule is applied for placing B1 immediately after A1 in the next clockwise right-angled position. The outgoing vector is always aligned along the y axis and is taken as beginning from the origin of the Cartesian system that is comprised of the x, y, and z reference lines as shown above. The reaction involving system 2 is the mirror image and therefore the conjugate of system 1 no matter what the original orientation of system 1 may have initially been. Therefore the resultant force between system 1 and system 2 is always one of attraction. This may be verified by the reader by changing the beginning axis of A1 and B1 in system 1 and then also changing A2 and B2 in system 2 to reflect a conjugate mirror image of system 1. The total interaction force shown as F_{g1} will always be one of attraction. (B1 must follow A1 in a clockwise right-angled fashion.)

It is postulated by this author that the action from system 1 is felt by system 2 instantaneously but the reaction from system 2 is felt by system 1 at the limiting velocity of light in free space. This is by reason that there exists a constant radius involving the classical radius of the electron, (l_q), that is connected to the singular imaginary space interconnect that connects all of normal space to one point in imaginary energy space. It is this distance that is related to the instantaneous action. The other radius is a variable and is the distance in normal space between system 1 and system 2. It is this distance that is related to the reaction limiting velocity of light in free space. By imaginary space I do not mean *not real* but rather purely reactive energy such as purely inductive or capacitive standing wave energy connecting all of normal space to one energy source in alternate space-time. That space exists as a time slice right next to our normal space and supports our space

much like a projector supports a virtual world upon a movie theater screen. Our normal space however is three dimensional and is comprised not only of standing field-wave energy (mass) but also supporting living beings endowed with self-volition of thought and physical action. It is further postulated that the energy-space that supports normal space can start or stop normal space action at any time for any required length of time and without normal space beings being any the wiser.

The above postulate places our normal space at the complete mercy of a higher ordered energy and intellect. While a large number of scientists feel comfortable in dismissing the concept of there being a God that is the all creator, I personally feel that a comprehensive *Theory Of Everything*, (TOE), must logically include such a possibility in its basic concept since God is energy and energy is everything.

The ability to start or stop normal space at any time for any length of time allows for adjustment as necessary for maintaining reasonable normal space continuity when tears or rips in our space begin to appear or become a threat to normal space existence, (A nuclear explosion for instance.) It also allows for evolvement adjustment of the species which is not of course what Darwin suggested at all. Present day evolvement of the species is rather more likely the result of a huge amount of constructive input and not in any sense an accident by way of what is called natural selection. If what Darwin suggested was the only prime mover in evolution this would indeed be a very bizarre if not totally barren planet. There is not enough elapsed time for random molecular opportunity to allow for the possibility of present day evolution from the primordial soup to what is now evolved. It is also a law of thermodynamics that guarantees that matter tends to devolve by entropy rather than constructively evolve over time. This is also a form of Murphy's law wherein it is stated, "anything

that can go wrong will go wrong." This leaves no room for events to *naturally* go right.

Perhaps a way of further illustrating normal space matter existing as supported field-mass from imaginary energy-space is to have the reader think of themselves as only existing during a strobe light flash such as are sometimes seen at dance clubs. There could be many other worlds of action going on between the flashes that the reader would be totally unaware of. Time-slices are a familiar concept in computer technology such as running several programs at once. (A part of each program is actually run at any one time and the computer keeps track of which part belongs to which program.) Therefore continuous motion is apparent to the observer but in the fine scale the action is composed of slices of time. Thus one program is not allowed to run into or become a part of another program at any time. Truly, every hair is accounted for on the collective pate of reality. Also, the time line is always in one direction since the microprocessor clock does not run backwards. This is a parallel for what we take as the unidirectional arrow of time in normal space. Therefore, only the master programmer has access to what has occurred in the past concerning the normal space program.

The utilization of the vector cross-product has a parallel in the unidirectional sense since it is generated at right angles to two non-parallel vectors and is somewhat also like the concept of the Big Bang since it has a point beginning and is possibly open-ended as to its eventual limit. Also the vector cross-product has the feature of being non-commutative in that $A \times B$ is not equal to $B \times A$. In fact, $A \times B = - (B \times A)$. This guarantees a force of attraction for the case of mirror image symmetry involving the reaction vector as compared to the original action vector. Further, the relationship of the magnetic vector potential to the vector cross-product can be illustrated to be a

very close one indeed.

One of the strongest arguments against an electromagnetic connection to the gravitational field was that an electromagnetic field can be shielded against while the gravitational field cannot. Further, the electromagnetic field has a bipolar aspect consisting of a negative and positive sense in the field and is a closed field such that all magnetic lines form a closed loop. Also, the gravitational field apparently has no counterpart aspect of repulsion as does the magnetic or electric fields. The mmagnetic vector potential ¹ CAN however act through the best of shielding and when combined with the concept of the vector cross-product of two quantum uncertain currents acting 90 degrees to each other, the quantum electrogravitational action is generated that we take to be what is currently called gravity. Even though the action is unidirectional and always outwards from the origin, the reaction is a mirror image and is the conjugate of the action vector in every way. Thus the total interaction that occurs in part in normal space is closed through the classic quantum radius points through imaginary energy space while to an outside observer in normal space it would appear that a monopole action had just occurred.

It has been demonstrated that the wavefunction of an electron may be changed in a region where there is no magnetic field of flux. Therefore the magnetic potential vector (**A**) appears to be able to affect an action in the absence of its (**B**) field.

 Note (1) above: See the article, "Quantum Interference and the Aharonov-Bohm Effect", Scientific American, April 1989, pages 56-62 by Yoseph Imry and Richard A. Webb for a very lucid explanation of the quantum aspects of the electric scalar potential and the magnetic vector potential and how they cannot be shielded against.

Partial quotes from the article referenced in footnote 1 on page 149 previous are; "When the theories of relativity and quantum mechanics were introduced, the potentials, not the electric and magnetic fields, appeared in the equations of quantum mechanics, and the equations of relativity simplified into a compact mathematical form if the fields were expressed in terms of potentials." Also is further quoted; "The consequence of the Aharonov-Bohm effect is that the potentials, not the fields, act directly on charges."

The cross-product potential method described previously is now presented below for a two system interaction involving current vectors 90 degrees to each other that are generated by the uncertainty of charge position occurring in the right-hand rule fashion in system 1 and which then cause a mirror image conjugate reaction in system 2. This will be for systems at the atomic Bohr radius during wave function collapse.

Let the following parameters be established:

$q_o := 1.602177330 \cdot 10^{-19} \cdot \text{coul}$	Electron charge.
$\mu_o := 1.256637061 \cdot 10^{-06} \cdot \text{henry} \cdot \text{m}^{-1}$	Free space permeability.
$V_{LM} := 8.542454612 \cdot 10^{-02} \cdot \text{m} \cdot \text{sec}^{-1}$	Mag. rotational vector velocity.
$l_q := 2.817940920 \cdot 10^{-15} \cdot \text{m}$	Classic electron radius.
$r_{n1} := 5.291772490 \cdot 10^{-11} \cdot \text{m}$	Bohr n1 radius.
$\theta := \frac{\pi}{2}$	$\phi := \frac{\pi}{2}$

Now let the following establish the system 1 action involving the two right angled currents generated by quantum charge position uncertainty;

$$(264) \quad \iota_{1a} := \frac{q_o \cdot V_{LM}}{l_q} \cdot \sin(\theta) \quad \text{where, } \iota_{1a} = 4.856924793831499 \cdot 10^{-6} \cdot \text{amp}$$

(= imaginary space quantum constant current.)

and;

$$(265) \quad \iota_{1b} := \frac{q_o \cdot V_{LM}}{r_{n1}} \cdot \sin(\phi) \quad \text{where, } \iota_{1b} = 2.586378599564538 \cdot 10^{-10} \cdot \text{amp}$$

(= normal space variable distance current.)

and where $\sin(\theta)$ and $\sin(\phi)$ are equal to: $\sin(\theta) = 1$ $\sin(\phi) = 1$

which are the angles formed by the quantum charge uncertainty directions to the direction of current formed by the quantum motion of the electron originally.

It is apparent that a spherical shell of uncertainty would form about an isolated charge in random quantum motion while for a moving charge forming a current line, a cylindrical shell of uncertainty would be formed around the direction of charge motion.

Then the quantum current vector potentials for system 1 may be stated as;

$$(266) \quad A1 := \begin{pmatrix} 0 \\ 0 \\ \iota_{1a} \end{pmatrix} \cdot \text{amp} \qquad (267) \quad B1 := \begin{pmatrix} \iota_{1b} \\ 0 \\ 0 \end{pmatrix} \quad \text{Rotation is: Z into X.}$$

and thus when the dimensional constants are included times the vector cross-product;

$$(268) \quad \text{Sys1} := \frac{\mu_o}{4 \cdot \pi} \cdot (A1 \times B1)$$

or, $\text{Sys1} = \begin{pmatrix} 0 \\ 1.256184634210259 \cdot 10^{-22} \\ 0 \end{pmatrix} \cdot \text{newton}$

This is the localized system 1 force of quantum uncertain current and it is the outgoing (+y) magnetic vector potential.

Then also for system 2;

$$(269) \quad i_{2a} := \frac{q_o \cdot V_{LM}}{l_q} \cdot \sin(\theta) \quad \text{where, } i_{2a} = 4.856924793831499 \cdot 10^{-6} \cdot \text{amp}$$

and;

$$(270) \quad i_{2b} := \frac{q_o \cdot V_{LM}}{r_{n1}} \cdot \sin(\phi) \quad \text{where, } i_{2b} = 2.586378599564538 \cdot 10^{-10} \cdot \text{amp}$$

Then also the quantum current potentials for system 2 may be stated as;

$$(271) \quad A2 := \begin{pmatrix} 0 \\ 0 \\ i_{2a} \end{pmatrix} \cdot \text{amp} \qquad (272) \quad B2 := \begin{pmatrix} -i_{2b} \\ 0 \\ 0 \end{pmatrix} \quad \text{Rotation is: Z into -X.}$$

and thus the cross-product of the current potentials times the geometrical constant is;

$$(273) \quad \text{Sys2} := \frac{\mu_o}{4 \cdot \pi} \cdot (A2 \times B2)$$

$$\text{or, } \text{Sys2} = \begin{pmatrix} 0 \\ -1.256184634210259 \cdot 10^{-22} \\ 0 \end{pmatrix} \cdot \text{newton}$$

This is the localized system 2 force of quantum uncertain current and is the outgoing (-y) magnetic vector potential.

Finally, inserting the correct geometrical parameters the entire interaction forming the resultant electrogravitational result is;

$$(274) \quad F_g := (\text{Sys1}) \cdot \mu_o \cdot (\text{Sys2})$$

$$\text{or, } F_g = -1.982973075196837 \cdot 10^{-50} \cdot \text{newton}^2 \cdot \left(\frac{\text{henry}}{\text{m}} \right)$$

Only one newton term is a variable and is related to the distance between centers of the systems in question and is a force inversely proportional to the square of the distance between their centers. The other newton term is a constant related to the classic radius of the electron as shown previously in equations (264) and (269). Their total product is shown as newton squared. Next, the classical value for the force of gravity is shown below for the sake of comparison.

Let the following parameters be established for the Bohr radius:

$$m_e := 9.109389700 \cdot 10^{-31} \cdot \text{kg} \quad \text{Electron rest mass.}$$

$$G := 6.672590000 \cdot 10^{-11} \cdot \text{newton} \cdot \text{m}^2 \cdot \text{kg}^{-2} \quad \text{Gravitational constant.}$$

Then for the classical expression;

$$(275) \quad FG := \frac{G \cdot m_e \cdot m_e}{r_{n1}^2} \quad \text{or, } FG = 1.977291388968519 \cdot 10^{-50} \cdot \text{newton}$$

The henry/meter units would not be apparent to the outside observer such they form a constant of interaction that is unaffected by interaction distance between systems. One of the Newton terms is the only detectable parameter and it is a variable.

Also there is no forward momentum to the y vector. The momentum is in the rotation of the z and x vectors which cancel when systems interact along the y vector path. Attraction along the y vector path occurs after the x and z rotation vectors cancel which creates an energy void between the systems of interaction. Therefore the interacting systems tend to move together due to the field energy vacuum between them.

Equation (274) above is now the preferred electrogravitational equation and thus

the previous forms, while generally containing the basic mechanics, are not as exact in explaining the system interaction dynamics. In fact, equation (274) may yet again be improved upon in the future for this is a complex force and further inspiration may yield an even closer form for the ultimate electrogravitational statement.

In chapter 1, page 16, the electrogravitational quadset of equations are all still generally acceptable regarding the mechanics of two system interactions of separate system forces causing the electrogravitational force. They are all different facets of the same idea. Equation (274) on page 152 previous is a new way of looking at the same principle as well as a hopefully improved way. In this vein the weak force and the strong force equations in chapter 1, on pages 17, 18, and 19 respectively, will be examined by method of the vector cross product.

First we will define additional parameters as;

$$\begin{aligned} \epsilon_0 &:= 8.854187817 \cdot 10^{-12} \cdot \text{farad} \cdot \text{m}^{-1} && \text{Dielectric Permittivity of free space.} \\ r_{\text{cn}} &:= 2.100194469 \cdot 10^{-16} \cdot \text{m} && \text{Compton radius of the Neutron.} \\ r_{\text{ec}} &:= 3.861593223 \cdot 10^{-13} \cdot \text{m} && \text{Compton radius of the Electron.} \end{aligned}$$

Further let new magnetic potentials for a system 2 be defined as:

$$(276) \quad {}_{1\text{cn}2}a := \frac{q_0 \cdot V_{\text{LM}}}{r_{\text{cn}}} \cdot \sin(\theta) \quad (277) \quad {}_{1\text{cn}2}b := \frac{q_0 \cdot V_{\text{LM}}}{r_{\text{cn}}} \cdot \sin(\phi)$$

where;

$${}_{1\text{cn}2}a = 6.516790384852854 \cdot 10^{-5} \cdot \text{amp} \quad \text{and} \quad {}_{1\text{cn}2}b = 6.516790384852854 \cdot 10^{-5} \cdot \text{amp}$$

Then the magnetic vectors associated with the above current potentials are;

$$(278) \quad A_{\text{cn}2} := \begin{pmatrix} {}_{1\text{cn}2}a \\ 0 \\ 0 \end{pmatrix} \quad (279) \quad B_{\text{cn}2} := \begin{pmatrix} 0 \\ 0 \\ {}_{1\text{cn}2}b \end{pmatrix} \cdot \text{amp} \quad \text{Rotation is: X into Z.}$$

Then inserting the following dimensional constants into the cross-product of the current potentials above;

$$(280) \quad \text{Sys2}_{cn} := \frac{\mu_o}{4 \cdot \pi} \cdot (\text{Acn2} \times \text{Bcn2})$$

$$\text{or; } \text{Sys2}_{cn} = \begin{pmatrix} 0 \\ -4.246855690537861 \cdot 10^{-16} \\ 0 \end{pmatrix} \cdot \text{newton}$$

This is the Compton system 2 outgoing (-y) magnetic potential vector.

The above is the magnetic vector potential that is set at the interaction distance of the Compton radius of the Neutron.

Next we will determine the electric vector potentials associated with the quantum charge uncertainty right-angled action also at the Compton radius of the Neutron.

Now let the Neutron electric potentials be defined as;

$$(281) \quad v_{1a} := \frac{q_o}{r_{cn}}$$

$$(282) \quad v_{1b} := \frac{q_o}{r_{cn}}$$

where,

$$v_{1a} = 7.628709405957398 \cdot 10^{-4} \cdot \text{sec} \frac{\text{amp}}{\text{m}} \quad v_{1b} = 7.628709405957398 \cdot 10^{-4} \cdot \text{sec} \frac{\text{amp}}{\text{m}}$$

Then the charge potential uncertainty vectors are;

$$(283) \quad \text{Ap1} := \begin{pmatrix} 0 \\ 0 \\ v_{1a} \end{pmatrix} \cdot \text{sec} \cdot \frac{\text{amp}}{\text{m}}$$

$$(284) \quad \text{Bp1} := \begin{pmatrix} v_{1b} \\ 0 \\ 0 \end{pmatrix} \quad \text{Rotation is: Z into X.}$$

and thus when the dimensional constants are included for the uncertainty charge potential cross-product is;

$$(285) \quad \text{Sysp1} := \frac{1}{4 \cdot \pi \cdot \epsilon_o} \cdot (\text{Ap1} \times \text{Bp1}) \quad = \text{charge-potential action system.}$$

$$\text{or, } \text{Sysp1} = \begin{pmatrix} 0 \\ 5.23050413631724 \cdot 10^3 \\ 0 \end{pmatrix} \cdot \text{newton}$$

Then finally, the weak force is given as:

$$(286) \quad F_w := \text{Sysp1} \cdot \frac{2 \cdot \pi^2}{\epsilon_0} \cdot \text{Sys2}_{cn} \quad \text{or, } F_w = -4.952130315252498 \cdot \frac{\text{m}}{\text{farad}} \cdot \text{newton}^2$$

where the Sys2 magnetic vector potential is the more likely unification parameter and since it is (-) it will yield an overall force of attraction. There is a probability that the Sys2cn vector uncertainty could change the vector 180 degrees and cause Fw to become a (+) force and it is that mechanism that could cause decay of a bare neutron. The ratio of the absolute magnitudes of the electric coulomb force Sysp1 to the weak force Fw is given below as;

$$(287) \quad R_{cw} := \frac{\text{Sysp1}}{F_w} \quad \text{or, } R_{cw} = \begin{pmatrix} 0 \\ -1.056212943388698 \cdot 10^3 \\ 0 \end{pmatrix} \cdot \frac{\text{farad}}{\text{m} \cdot \text{newton}}$$

where the absolute magnitude is given as:

$$|R_{cw}| = 1.056212943388698 \cdot 10^3 \cdot \text{farad} \cdot \text{m}^{-1} \cdot \text{newton}^{-1}$$

This sets the coulomb force as close to 1000 times as strong as the weak force in magnitude at the Compton radius of the Neutron.²

The strong force is similar in its form to the weak force equation above wherein only the connecting term geometry need be changed.

Note 2 above and on the bottom of page previous: Page 110 of Scientific American (January 1990) in the article "Handedness³ of the Universe" states that "The weak force is 1000 times less powerful than the electromagnetic force and 100,000 times less powerful than the strong nuclear force."

Therefore;

$$(288) \quad F_s := \text{Sysp1} \cdot \left(\frac{2 \cdot \pi \cdot r_{n1}}{\epsilon_0 \cdot r_{cn}} \right) \cdot \text{Sys2}_{cn}$$

$$\text{or, } F_s = -3.971767755918961 \cdot 10^5 \cdot \frac{\text{m}}{\text{farad}} \cdot \text{newton}^2$$

and the ratio of the strong force at the Neutron radius to the weak force is~~2~~:

$$(289) \quad R_{sw} := \frac{F_s}{F_w} \quad \text{or,} \quad R_{sw} = 8.02032156481417 \cdot 10^4$$

and the ratio of the strong force to the Coulomb force at the Neutron radius is~~2~~;

$$(290) \quad R_{sc} := \left| \frac{F_s}{|\text{Sysp1}|} \right| \quad \text{or,} \quad R_{sc} = 75.93470251445883 \cdot \text{m} \cdot \frac{\text{newton}}{\text{farad}}$$

See note 2 on the previous page concerning the relative force magnitudes of the coulomb, weak and strong forces. While the relative magnitudes are not precisely 100,000 for the force of the strong nuclear force to the weak force at the Neutron radius, 80,000 is fairly close for this distance considering that it is not the actual binding energy interaction distance. Also the ratio of the strong force to the Coulomb force is not exactly equal to 100 but again is fairly close considering the approximate interaction distance used which again is equal to the Compton radius of the Neutron.

Please note that the electric and magnetic forces are considered herein as singular system interactions that contain coupled quantum-uncertain instantaneous displacements of a singular charge that forms a two-charge interaction through normal space. This may be expanded upon by considering that if a charged particle is considered as instantaneously jumping back and forth, it can couple to itself through the field established at the velocity of light across the distance that it jumps through. If in linear motion, a wave of probability would result. If in circular motion, a

standing probability wave would most likely result. If not in relative motion to another local particle, a spherical shape would best describe the probable location of the charge around its most likely position in space-time.

This is a universal situation that occurs everywhere in the universe and every singular system sees all other such quantum-uncertain systems as conjugate systems, (mirror-images), that will call for the case of attraction. All quantum displacements are right-handed in sequence of vector displacement. Quantum displacements of charge may be thought of as either being an instantaneous current vector or voltage difference vector, thus there exists a vector voltage potential as well as a current (magnetic) vector potential.

Both the electric potential and the magnetic vector potential can use the cross-product approach since the uncertainty at 90 degrees can generate a new vector. This vector is 90 degrees to the two initial 90 degree displaced uncertainty vectors.

The above may play a fundamental role in the process of superconductivity. If one considers that an alternating tunneling process may occur wherein a hole or electron keeps jumping forward across space in quantum uncertain fashion from its last temporarily established position, then superconductivity is the result of a coherent process of quantum uncertainty in inline forward action. Therefore, in the case of the above postulate, for a superconductor, the S-wave is the spherical electric potential field caused by the instantaneous displacement of charge while the D-wave is the right-angular (lobed) wave related to the magnetic B-field generated by the instantaneous displacement (inline) of the general charge displacement. Further, since the vector-potential cannot be shielded against, if the quantum displacement associated with the generation of the vector-potential were to occur near a nucleus,

say a Deuterium nucleus, then a nucleus may "swallow" the particle that was generating that vector potential.

This would be fusion and thus a low energy form of the fusion reaction that is usually done at very high energies such as in a fusion reactor. It has been noted to occur sporadically in some cases and has been labeled "cold fusion". This type of action is difficult to control since the mechanism relies on quantum uncertainty and nuclear distances of interaction. It is however an expected possibility due to the nature of the quantum uncertainty principle as set forth by Heisenbergs uncertainty principle. That is, if you slow down a particle enough, its position in space-time becomes very uncertain. It could even land in and be captured by an adjacent nucleus. This is simply the nature of quantum action as it is presently understood and accepted by the physics community world-wide. Therefore cold fusion is very probable and possible as defined by the already known and accepted principles of quantum physics.

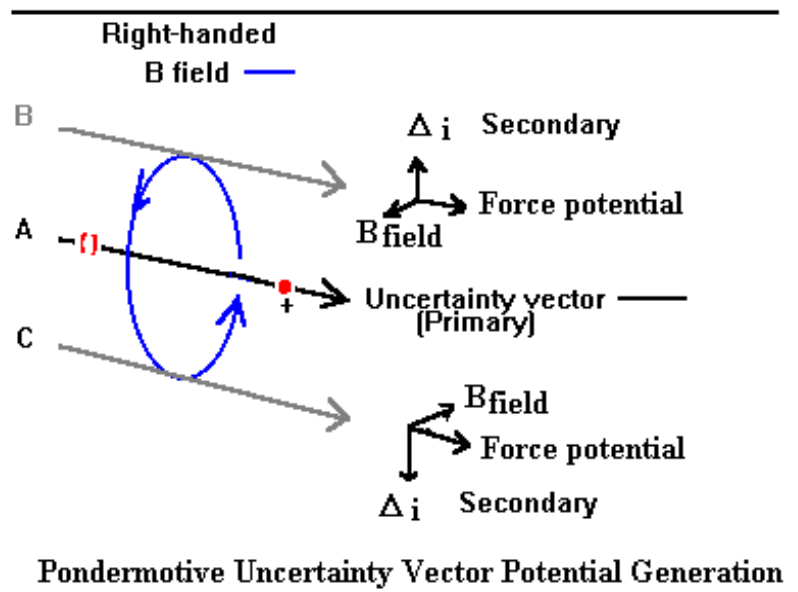
For a summation of the preceding concerning the electrogravitational, strong and weak forces, let us return to where we left off on the singular cross-product system and the generation of the vector potential action. The electrogravitational, strong and weak forces are all two system interactions, (at a minimum), that are unified by their common use of the vector potential, therefore this approach unifies the forces. This has all been presented before by this author but not in the context of the quantum-action vector potential cross-product being a mechanism of the interaction forces.

It is obvious that anti-gravity would be most likely achieved by creating a left-handed system field between a local mass system and a vehicle or craft

designed for the purpose of interstellar travel. The force would repel on one side where the left-handed field was opposing the local gravitational field and attract the far mass of outer space with a normal right-hand field on the opposite side.

The theory of the generation of the electrogravitational pondermotive vector potential is based on the quantum mechanical uncertainty principle wherein a charged particle is first postulated to exist in free space by whatever cause. Then that particle spontaneously experiences a quantum uncertain jump along some line of action as shown in figure 10 below and where that line is the primary current uncertainty line designated as (A) in the drawing. (This action must occur eventually and is guaranteed to do so by the accepted theory of quantum mechanics.) It may also experience that jump in any direction whatsoever and is instantaneous.

Figure 10



Next, the primary uncertainty vector experiences another quantum uncertainty jump to position (B) where it meets the established B field as shown with the uncertainty current Δ_i direction as shown. This creates the vector force potential as

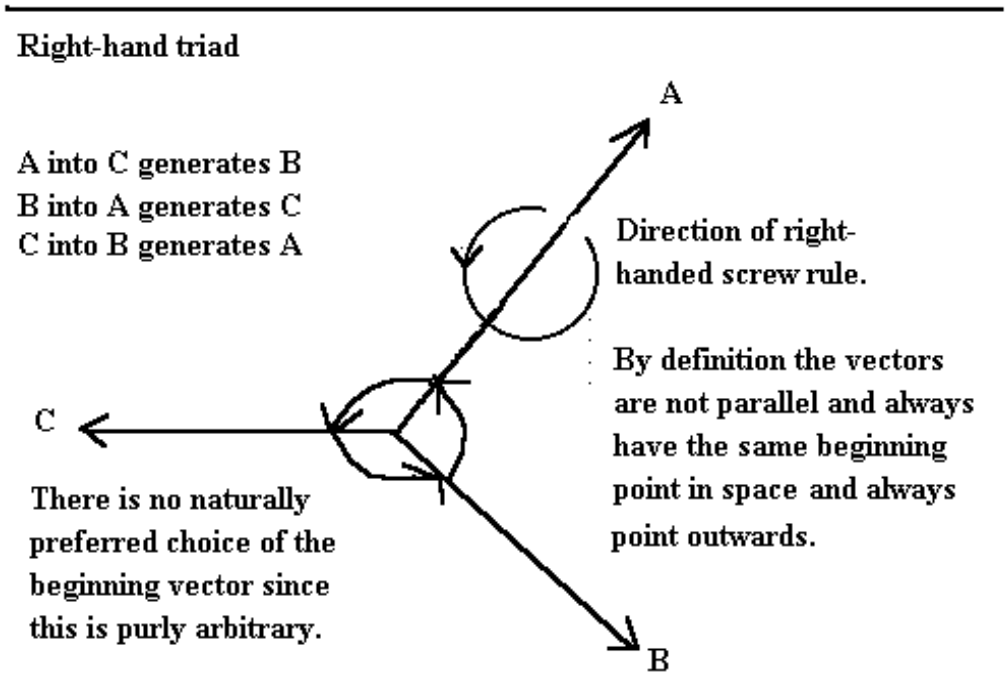
shown in front of vector (B). Further the next jump from the primary vector may be to the vector (C) as shown in figure 2 where it again generates a potential force vector as shown in front of vector (C). This action will eventually form a vector force potential pointing outwards from the charged particles most likely or probable location in all possible directions, forming a spherical shape of outwards pointing vector force potential.

Any and all other charged particles may be considered to be doing exactly the same and when charge is considered as either (+) or (-) the vector force potential still points outwards since the direction of the B field generated by the initial quantum uncertain displacement will be opposite for opposite charge situations. Therefore a vector cross-product will describe the quantum uncertainty generation of the vector force potential described above which we will now define as a case for vector potentials in general.

The vector cross-product is a mathematical concept developed long ago to give a mathematical formalism to the action of electromagnetic fields and the direction of force that a given current will impart when in the presence of a magnetic field. This is a well established formalism and therefore can very well be adapted to the newer but still just as established quantum uncertainty principle as outlined above in figure ten and in the related text concerning it.

The concept of the right-hand screw rule is presented next in figure 11 and is doubtless familiar to those who have studied static magnetic field theory. Here we have the familiar right-handed triad that represents the force vector derived from the interaction of current and field flux.

Figure 11



The vector cross-product approach can be utilized to allow non-parallel differential quantum displaced charge generated (voltage) vectors as well as similarly generated current vectors which then generate vector force potentials at right angles to them as has previously been presented in this paper.

In summation, the vector force potential cannot be shielded against and its generation involves quantum uncertain jumps that occur instantaneously. The action is based on the right-handed rule of static magnetic field theory as it is applied to a quantum mechanical aspect involving the spontaneous generation of a pondermotive force vector potential. This action can be analyzed by use of the cross-products of the uncertainty currents or potentials generated through naturally occurring and spontaneous quantum action on charges (or matter in general) that may be equivalent to charge. Again, charge can be shown to be intimately related to mass as is shown next. (This is so important that it bears repeating.)

First let:

$$\mu_0 := 4 \cdot \pi \cdot 1 \cdot 10^{-7} \cdot \text{henry} \cdot \text{m}^{-1} \quad \text{Permeability of free space.}$$

$$q_0 := 1.602177330 \cdot 10^{-19} \cdot \text{coul} \quad \text{Electron charge.}$$

$$l_q := 2.817940920 \cdot 10^{-15} \cdot \text{m} \quad \text{Classic electron radius.}$$

Then,

$$(291) \quad m_e := \frac{\mu_0 \cdot q_0^2}{4 \cdot \pi \cdot l_q} \quad \text{or,} \quad m_e = 9.109389691413149 \cdot 10^{-31} \cdot \text{kg}$$

where charge squared is shown to be directly related to mass by the geometrical constants of the permeability of free space and the classical radius of the electron.

Therefore charge is inside of mass in the form of a quantum standing-energy-wave.

It may further be developed that the classical radius of the electron is based on the Compton electron radius times the fine structure constant. This concept is extended to the classical radius of a proton for the proper force calculation involving the mass generating charge directly. First let the following constants be stated:

$$h := 6.626075500 \cdot 10^{-34} \cdot \text{joule} \cdot \text{sec} \quad \text{Plank constant.}$$

$$\epsilon_0 := 8.854187817 \cdot 10^{-12} \cdot \text{farad} \cdot \text{m}^{-1} \quad \text{Dielectric permittivity of free space.}$$

$$c := 2.997924580 \cdot 10^8 \cdot \text{m} \cdot \text{sec}^{-1} \quad \text{Velocity of light in free space.}$$

$$\alpha := 7.297353080 \cdot 10^{-3} \quad \text{Quantum fine structure constant.}$$

First, as a check, the classical radius of the electron is calculated:

$$(292) \quad l_q := \frac{h \cdot \alpha}{2 \cdot \pi \cdot m_e \cdot c} \quad \text{or,} \quad l_q = 2.817940945728527 \cdot 10^{-15} \cdot \text{m}$$

= accepted known value.

Then the classical radius of the Proton is calculated:

$$m_p := 1.672623100 \cdot 10^{-27} \cdot \text{kg} \quad \text{Proton rest mass.}$$

then,

$$(293) \quad l_{qp} := \frac{h \cdot \alpha}{2 \cdot \pi \cdot m_p \cdot c} \quad l_{qp} = 1.534698534417613 \cdot 10^{-18} \cdot \text{m}$$

Since mass increases relativistically with an increase in relative velocity or increase in gravitational gradient potential, l_q or l_{qp} decreases by inverse proportion to the increase in mass. Let the initial relative velocity be set equal to zero. Also the mass increase due to a gravitational gradient potential be set equal to zero. Then:

let $v := 0 \cdot m \cdot \text{sec}^{-1}$ thus;

$$(294) \quad m_{p'} := \frac{m_p}{\sqrt{1 - \frac{v^2}{c^2}}}$$

The point of deriving the classical particle radius as a function of its relativistic mass is to indicate that the concepts presented by this author do not intend to divorce the theory as presented from the special or general laws of relativity but rather include Einstein's theory when relativistic velocities and large gravitational potential gradients are present and need to be considered as locally influencing factors to the system being considered or analyzed. It is the mechanics of electrogravitation that are being presented and not an attempt to overthrow present relativistic theory. The main difference between the present interpretation of curved space causing gravity and my theory is that I present the concept that curved space is the result of gravity and not the cause, which is a simple but very fundamentally important approach for a workable solution to the mechanics of a gravitational action control principle.

Let us establish the magnetic vectors for a proton-electron electrogravitational action at the r_{n1} radius of the Bohr atom of Hydrogen.

First system 1 is established as:

$$(295) \quad {}_1\text{cp1}_a := \frac{q_o \cdot V_{LM}}{l_{qp}} \cdot \sin(\theta) \quad \text{and,} \quad {}_1\text{cp1}_b := \frac{q_o \cdot V_{LM}}{r_{n1}} \cdot \sin(\phi)$$

where;

$${}_1\text{cp1}_a = 8.918055771190335 \cdot 10^{-3} \cdot \text{amp} \quad \text{and,} \quad {}_1\text{cp1}_b = 2.586378599564538 \cdot 10^{-10} \cdot \text{amp}$$

Then the magnetic vectors associated with the above current potentials are;

$$(296) \quad \text{Acp1} := \begin{pmatrix} 0 \\ 0 \\ {}_1\text{cp1}_a \end{pmatrix} \cdot \text{amp} \quad \text{Bcp1} := \begin{pmatrix} {}_1\text{cp1}_b \\ 0 \\ 0 \end{pmatrix} \quad \text{Rotation is:} \\ \text{Z into X.}$$

Then inserting the correct dimensional constants into the cross-product of the current potentials above;

$$(297) \quad \text{Sys1}_{cp} := \frac{\mu_o}{4 \cdot \pi} \cdot (\text{Acp1} \times \text{Bcp1}) \quad \text{This is the proton triad system} \\ \text{outgoing vector potential.}$$

$$\text{or,} \quad \text{Sys1}_{cp} = \begin{pmatrix} 0 \\ 2.30654685963297 \cdot 10^{-19} \\ 0 \end{pmatrix} \cdot \text{newton}$$

The electron triad vector potential system is now calculated beginning with the statement for the A & B vectors which shall be labeled as Sys2.

$$(298) \quad {}_1\text{cp2}_a := \frac{q_o \cdot V_{LM}}{l_q} \cdot \sin(\theta) \quad \text{and,} \quad {}_1\text{cp2}_b := \frac{q_o \cdot V_{LM}}{r_{n1}} \cdot \sin(\phi)$$

where;

$${}_1\text{cp2}_a = 4.856924749486525 \cdot 10^{-6} \cdot \text{amp} \quad \text{and} \quad {}_1\text{cp2}_b = 2.586378599564538 \cdot 10^{-10} \cdot \text{amp}$$

Then the magnetic vectors associated with the above current potentials are:

$$(299) \quad \text{Acp2} := \begin{pmatrix} \text{icp2}_a \\ 0 \\ 0 \end{pmatrix} \quad \text{Bcp2} := \begin{pmatrix} 0 \\ 0 \\ \text{icp2}_b \end{pmatrix} \cdot \text{amp} \quad \text{Rotation is:} \\ \text{X into Z.}$$

Then again inserting the correct dimensional constants for the electron triad cross-product of the current potentials above;

$$(300) \quad \text{Sys2}_{cp} := \frac{\mu_o}{4 \cdot \pi} \cdot (\text{Acp2} \times \text{Bcp2}) \quad \text{This is the electron triad} \\ \text{system outgoing vector} \\ \text{potential.}$$

$$\text{or, } \text{Sys2}_{cp} = \begin{pmatrix} 0 \\ -1.25618462317673 \cdot 10^{-22} \\ 0 \end{pmatrix} \cdot \text{newton}$$

Then the total electrogravitational interaction force between a proton and an electron at the r_{n1} orbital of the element Hydrogen is;

$$(301) \quad F_{gep} := \text{Sys1}_{cp} \cdot \mu_o \cdot \text{Sys2}_{cp}$$

$$\text{or, } F_{gep} = -3.641041417148494 \cdot 10^{-47} \cdot \text{newton}^2 \cdot \left(\frac{\text{henry}}{\text{m}} \right)$$

Let us now calculate the classical electrogravitational force for the same parameters involving a proton-electron:

$$(302) \quad F_G := \frac{G \cdot m_p \cdot m_e}{r_{n1}^2} \quad \text{or, } F_G = 3.630609029167211 \cdot 10^{-47} \cdot \text{newton}$$

The (henry/m) term is a hidden term and is a quantum constant expression and only one Newton term is relevant to normal space measurements that have been made to date. Therefore it is suggested herein that the electrogravitational expression is the more correct one since it contains all the terms that relate to the

total electrogravitational interaction. It is also to be noted that charge polarity is not a factor since a (+) charge going in a given direction has the B field given as conforming to the right-hand rule and thus the force vector potential is in the same direction as a (-) charge going in the same direction as the (+) charge but has the B field going in a direction opposite to the right-hand rule. Thus the charge polarity is arbitrary and only the fact that vector potential forces are based on the right-hand triad system as previously presented need be considered in their calculation.

The above counters one of the common arguments against electromagnetic forces being applicable to the gravitational action due to the fact that the electron-proton force is different than the electron-electron force at the same considered distance using the classical gravitational equation as compared to the fact that the classical electrostatic force equation gives the same force since it is simply based on charge potential which is the same for a proton as it is for an electron. The previously presented equation (291) of this chapter proves that the superposition of a charge (q_0^2) coupled to μ_0 over $4\pi l_q$ yields the mass of the electron exactly where l_q is the classical radius of the electron and where l_q is also directly proportional to the Lorentz statement for relativistic length contraction as the electron is approaching the speed of light in free space. Thus mass will increase also as l_q decreases.

I have often read of the curvature of space causing two objects to attract each other wherein the analogy of a bowling ball on a mattress or elastic surface creates a dent in that surface and then if a baseball or golf ball were to also be placed on that same surface in a proximate position to the bowling ball the curvature of the surface

would allow that the smaller mass would roll down towards the larger mass. What is not quite right here is that a force of gravity is being used to explain the curvature of space which is causing a force of gravity. This is moibus band logic that calls for the creation of higher dimensional space to hopefully allow for enough dimensions that will cause the moibus band logic to look like flat space. Again, I very strongly suggest that curved space may well exist but it is the result of the electrogravitational action and not the other way around. Further, the equivalence principle allows for the fact that a spaceship may be perfectly balanced in an orbit suspended between an inertial force and the gravitational force indefinitely but when close analysis is brought to bear it is obvious that the principle of action of the two forces are not the same.

Further, this requires that we consider that in order for a linear acceleration to be the same as a gravitational acceleration we must allow all matter to be expanding so that a constant force be developed between objects already in contact with each other and therefore all objects not touching will also tend to move together. While this is perfectly conceivable in thought, the energy required to do this would be vastly beyond any logical limit. Therefore I present my analysis of what the gravitational action most likely is by utilizing the vector potential cross-product approach as a more reasonable actual mechanism of the gravitational action.

The Gravitational Constant Problem

Chapter 10

Recent experiments that attempted to refine the value of the accepted value of the gravitational constant has revealed a fairly large discrepancy, not only between the new values, but the old value as well. A quote from the April 29, 1995 issue of Science News is, "Now, experiments by three independent groups have produced values for the strength of the gravitational force (G) that disagree significantly with the currently accepted number and with each other." (See Reference [1], p. 176).

Further, from the May 18, 1996 issue of Science News, "The news that three respected research groups had independently produced values for the strength of the gravitational force (G) that disagreed significantly with the currently accepted number and with each other created a considerable stir last year." (See Reference [2]).

Finally, a quote from the March 1996 issue of Discover Magazine, "Ever since Isaac Newton watched an apple fall to the ground, scientists have taken gravity for granted. Until, that is, they tried to measure its strength with high-tech precision. Their results were so incredibly far off as to be newsworthy." (See Reference [3]).

The results quoted above can be accounted for by the quantum vector potential nature of electrogravitation as proposed in this book.

Some of the equations that have been previously presented will be repeated in this chapter in order that they may be made immediate to our present discussion. Also, the following parameters are stated for the equations that follow for those who are reading this in the active Mathcad mode.

The following constants are pertinent to this chapter and are all in the MKS system of units.

$m_e := 9.109389700 \cdot 10^{-31} \cdot \text{kg}$	Electron rest mass.
$q_o := 1.602177330 \cdot 10^{-19} \cdot \text{coul}$	Electron quantum charge.
$\mu_o := 1.256637061 \cdot 10^{-06} \cdot \text{henry} \cdot \text{m}^{-1}$	Magnetic permeability.
$\epsilon_o := 8.854187817 \cdot 10^{-12} \cdot \text{farad} \cdot \text{m}^{-1}$	Dielectric permittivity.
$r_c := 3.861593255 \cdot 10^{-13} \cdot \text{m}$	Compton electron radius.
$l_q := 2.817940920 \cdot 10^{-15} \cdot \text{m}$	Classic electron radius.
$c := 2.997924580 \cdot 10^{08} \cdot \text{m} \cdot \text{sec}^{-1}$	Speed of light in vacuum.
$\alpha := 7.297353080 \cdot 10^{-03}$	Fine structure constant.
$G := 6.672590000 \cdot 10^{-11} \cdot \text{newton} \cdot \text{m}^2 \cdot \text{kg}^{-2}$	Accepted gravitational constant.
$R_{n1} := 5.291772490 \cdot 10^{-11} \cdot \text{m}$	Bohr radius of Hydrogen.
$h := 6.626075500 \cdot 10^{-34} \cdot \text{joule} \cdot \text{sec}$	Plank constant.

These are the currently accepted values. The below constants are related directly to the theory of electrogravitation proposed by this author.

$V_{LM} := 8.542454612 \cdot 10^{-02} \cdot \text{m} \cdot \text{sec}^{-1}$	Least quantum velocity.
$f_{LM} := 1.003224805 \cdot 10^1 \cdot \text{Hz}$	Least quantum frequency.
$L_Q := 2.5729832158 \cdot 10^3 \cdot \text{henry}$	Least quantum inductance.
$C_Q := 3.861593281 \cdot 10^{-6} \cdot \text{farad}$	Least quantum capacitance.
$i_{LM} := q_o \cdot f_{LM}$ or, $i_{LM} = 1.607344039464671 \cdot 10^{-18} \cdot \text{amp}$	
(= Least quantum amp.)	

It is shown below that several electrogravitational force equations can be presented that will all yield the same answers. This indicates that the gravitational force-field theory presented herein spans a great many of the forms of energy and force branches on the tree of physics. Three of those equations are presented below in equations (303), (304), and (305).

$$(303) \quad F1_{Gnew} := \left(\frac{h \cdot f_{LM}}{R_{n1}} \right) \cdot \mu_o \cdot \left(\frac{h \cdot f_{LM}}{R_{n1}} \right)$$

$$\text{or,} \quad F1_{Gnew} = 1.982973082194035 \cdot 10^{-50} \cdot \frac{\text{henry}}{\text{m}} \cdot \text{newton}^2$$

$$(304) \quad F2_{Gnew} := \left(\frac{L_{Q \cdot i} \cdot LM^2}{R_{n1}} \right) \cdot \mu_o \cdot \left(\frac{L_{Q \cdot i} \cdot LM^2}{R_{n1}} \right)$$

$$\text{or,} \quad F2_{Gnew} = 1.982973078357832 \cdot 10^{-50} \cdot \left(\frac{\text{henry}}{\text{m}} \right) \cdot \text{newton}^2$$

$$(305) \quad F3_{Gnew} := \frac{m_e \cdot V_{LM}^2}{R_{n1}} \cdot \mu_o \cdot \frac{m_e \cdot V_{LM}^2}{R_{n1}}$$

$$\text{or,} \quad F3_{Gnew} = 1.982973080311042 \cdot 10^{-50} \cdot \left(\frac{\text{henry}}{\text{m}} \right) \cdot \text{newton}^2$$

It is easily seen that all three answers in equations (303), (304), and (305) are equal in magnitude and units.

It can also be shown that the famous Biot-Savart law that relates the magnetic field generated by a current can be incorporated into an electrogravitational expression also. This is presented by equations (308a, b & c) next.

First let us define the electrogravitational domain wavelength as:

$$(306) \quad \lambda_{LM} := \frac{V_{LM}}{f_{LM}} \quad \text{or,} \quad \lambda_{LM} = 8.514995412219695 \cdot 10^{-3} \cdot \text{m}$$

Also let the following angles be defined:

$$(307) \quad \theta := \frac{\pi}{2} \quad \text{and} \quad \phi := \frac{\pi}{2}$$

Then the Biot-Savart equation for the electrogravitational force between two electrons separated by the Bohr radius is given below in equation set (308).

$$(308a) \quad F_{\text{sys1}} := \left(q_o \cdot V_{LM} \cdot \sin(\phi) \right) \cdot \left(\frac{\mu_o \cdot i_{LM} \cdot \lambda_{LM} \cdot \sin(\theta)}{4 \cdot \pi \cdot l_q \cdot R_{n1}} \right)$$

$$(308b) \quad F_{\text{sys2}} := \left(q_o \cdot V_{LM} \cdot \sin(\phi) \right) \cdot \left(\frac{\mu_o \cdot i_{LM} \cdot \lambda_{LM} \cdot \sin(\theta)}{4 \cdot \pi \cdot l_q \cdot R_{n1}} \right)$$

Then finally;

$$(308c) \quad F4_{G_{\text{new}}} := F_{\text{sys1}} \cdot \mu_o \cdot F_{\text{sys2}}$$

$$\text{or, } F4_{G_{\text{new}}} = 1.982973075196836 \cdot 10^{-50} \cdot \frac{\text{henry}}{\text{m}} \cdot \text{newton}^2$$

The portion of the equations for the individual system forces that is the Biot-Savart least quantum expression at the Bohr radius is given below in equation (309).

$$(309) \quad B_{LM} := \left(\frac{\mu_o \cdot i_{LM} \cdot \lambda_{LM} \cdot \sin(\theta)}{4 \cdot \pi \cdot l_q \cdot R_{n1}} \right) \quad \text{or, } B_{LM} = 9.178257004292848 \cdot 10^{-3} \cdot \text{tesla}$$

Both of the equations in equation (308a & b) are of the standard form, $F = qV \times B$.

Now we have enough of what may be called a preponderance of evidence that will support the case for assigning new units to the classic value of G. This new value is stated below in equation (310).

$$(310) \quad G_{\text{new}} := \mu_o \cdot V_{LM}^4 \quad \text{or, } G_{\text{new}} = 6.69176350019664 \cdot 10^{-11} \cdot \text{henry} \cdot \left(\frac{\text{m}^3}{\text{sec}^4} \right)$$

The ratio of this new proposed value of G_{new} to G is:

$$(311) \quad \frac{G_{\text{new}}}{G} = 1.002873471949669 \cdot \frac{\text{henry}}{\text{m}} \cdot \text{newton}$$

The new value of G may be inserted into the classical formula for the gravitational force and the result is an electrogravitational expression. This is presented in equation (312) below.

$$(312) \quad F5_{G_{\text{new}}} := \frac{\text{NewG} \quad m_e \quad m_e}{\left(\mu_o \cdot V \text{ LM}^4 \right) \cdot \left(\frac{\mu_o \cdot q_o^2}{4 \cdot \pi \cdot l_q} \right) \cdot \left(\frac{\mu_o \cdot q_o^2}{4 \cdot \pi \cdot l_q} \right)}{R_{n1}^2}$$

$$\text{or,} \quad F5_{G_{\text{new}}} = 1.982973075196837 \cdot 10^{-50} \cdot \frac{\text{henry}}{\text{m}} \cdot \text{newton}^2$$

The above equation is now in the same general form as the classic gravitational expression. What is different are the extra henry/m and newton units. These 'extra' units are hidden units since the henry/m unit is a constant and the newton squared portion is actually inversely proportional to distance where each quantum newton force is also a constant / r . Thus on a macroscopic scale the simpler form of the classic gravitational force expression is assumed to be a correct form.

The following quote is from the book, Feynman Lectures on Gravitation, where Feynman's thoughts on the subject of the gravitational constant were condensed by the editor of the book, Brian Hatfield. He summed Feynman's conclusions as; "Of course, he expected that there might be difficulties in defining a consistent quantum theory (for example, the dimension of the gravitational constant is an obstacle to renormalization)." (See Reference [4])

It is suggested by this author that the problem of renormalization may be more easily solved by using the new value as defined in equation (310) previous.

It is also suggested by this author that the errors discovered in the recent attempts to measure the gravitational constant may be due to at least two effects. The first cause of error may be due to the metal and electronics that are part of the experimental hardware interacting with the quantum vector potentials generated in the Earth's molten core and stray ground currents associated with other actions near the Earth's surface. The second cause of error is that caused by the movement of mass in the locale of the test apparatus. It seems logical that if electrogravitation can cause a mass to accelerate, then accelerating a mass should create electrogravitation.

(More specifically, a wave of gravitation.) This could be a stronger influence than that accounted for by ordinary gravitational influences since the electrogravitational wave would have a strength related to the rate of acceleration of the mass as well as the magnitude of the mass.

It is suggested by this author that sensitive quantum interference detectors feeding an amplifier tuned to f_{LM} might detect nearby mass accelerations.

One of the strongest arguments against an electromagnetic connection to the gravitational field was that an electromagnetic field can be shielded against while the gravitational field cannot. Further, the electromagnetic field has a bipolar aspect consisting of a negative and positive sense in the field and is a closed field such that all magnetic lines form a closed loop. The gravitational field apparently has no counterpart aspect of repulsion as does the magnetic or electric fields. The magnetic vector potential, (MVP), **can** however act through the best of shielding and when

combined with the concept of the vector cross-product of two quantum uncertain currents acting 90 degrees to each others inline motion, the quantum electrogravitational action is generated that we take to be what is currently called gravity. Even though the action is unidirectional and always outwards from the origin, the reaction is a mirror image and is the conjugate of the action vector in every way. Thus, the total interaction that occurs partly in normal space is closed through the classic quantum radius points through imaginary energy space while to an outside observer in normal space it would appear that a monopole action had just occurred.

The Aharonov-Bohm effect has been demonstrated by actual experiment to prove that there exists quantum electromagnetic action through normally effective shielding.

The following is quoted from the April 1989 issue of Scientific American, (pages 56 to 62), "When the theories of relativity and quantum mechanics were introduced, the potentials, not the electric and magnetic fields, appeared in the equations of quantum mechanics, and the equations of relativity simplified into a compact mathematical form if the fields were expressed in terms of potentials." (See Reference [5]. Also, "The consequence of the Aharonov-Bohm effect is that the potentials, not the fields, act directly on charges." (Reference [5] also.)

It has been mentioned before that the electric, magnetic and gravitational force equations all have the same general form. Therefore, it is suggested that they are likely unified by a common mechanism of action. (See equations (312-314) below.)

$$(312) \quad F = \frac{q_o^2}{4 \cdot \pi \cdot \epsilon_o \cdot r^2} \quad (313) \quad F = \frac{\mu_o \cdot m_1 \cdot m_2}{4 \cdot \pi \cdot r^2} \quad (314) \quad F = \frac{G \cdot M_1 \cdot M_2}{r^2}$$

The terms m_1 and m_2 are the magnetic pole strengths in a classical magnetic force equation. M_1 and M_2 are the macroscopic mass terms in the classical gravitational force equation.

In concluding this chapter this author would like to say that while the classical gravitational equation was the first equation to be formalized concerning force at a distance, it has stubbornly refused to be improved upon with the possible exception of Einstein's General Theory of Relativity. Unfortunately this theory has not explained the mechanics correctly or we would have solved the anti-gravity puzzle. This book is a new approach utilizing the very basic accepted classical equations as a starting point to put the gravitational action in a logical engineering format and at the same time in terms of the more recent formulas of quantum physics.

Chapter 10 References

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A Uniting Force Constant

Chapter 11

Someone asked me recently, "which electrogravitational equation is the best equation to describe the total electrogravitational force action?" After some consideration I was forced to say that this was like asking which of the Earth's magnetic poles was the correct pole. All of the equations arrive at the correct force magnitude and each provide a way to arrive at the same conclusion.

However, the equations presented in *this* chapter involve a force constant as a connecting term between the separate involved system (**A**) vectors and I must admit that this form most satisfies my sense of the correct mechanics of electrogravitation.

The force constant is related to the least quantum power constant of chapter 5. The power constant was demonstrated by equations (187), p 94; (192), p. 96; and by the total electrogravitational result in equation (193), p. 96 also. Equation (193) is of the form of two weber/meter (**A**) terms connected by a force term (F_{qk}) derived from the power constant S_{ck} divided by the velocity of light (c) in free space. It is this preferred equational form that will be further developed in this chapter.

The least quantum power constant and force values are stated below as well as the quantum acceleration frequency (f_{at}) from equation (61), p. 25. Also frequency f_{C1m1} of equation (142), p. 67. They may be related to each other in a very profound way.

$$S_{cK} := 8.886962025439721 \cdot 10^{-09} \cdot \text{watt} \quad f_{C1m1} := 2.569222069780951 \cdot 10^{08} \cdot \text{Hz}$$

$$f_{at} := 3.520758889564392 \cdot 10^{10} \cdot \text{Hz} \quad c := 2.997924580 \cdot 10^{08} \cdot \text{m} \cdot \text{sec}^{-1}$$

First, we will derive the quantum force constant F_{qk} below in equation (315).

$$(315) \quad F_{qk} := \frac{ScK}{c} \quad \text{or,} \quad F_{qk} = 2.964371447076138 \cdot 10^{-17} \cdot \text{newton}$$

Utilizing the force constant F_{qk} , the power constant ScK , and the electrogravitational wavelength λ_{LM} , we can derive a frequency f_{at} below. First, we must state the value for λ_{LM} as:

$$\lambda_{LM} := 8.514995416 \cdot 10^{-03} \cdot \text{m} \quad (\text{Bottom of chapter 1, p. 25.}) \quad \text{Then,}$$

$$(316) \quad f_{at} := \frac{ScK}{F_{qk} \cdot \lambda_{LM}} \quad \text{or,} \quad f_{at} = 3.520758888920581 \cdot 10^{10} \cdot \text{Hz}$$

This result is exactly equal to equation (61), p. 25 as mentioned above and therefore must relate all of the above parameters in a very important way. Further, if we multiply the frequency f_{at} by the fine structure constant we obtain the exact results of equation (142), p. 67 of: $f_{C_{m1}} = 2.569222069780951 * 10^{08} \text{ Hz}$! This absolutely removes any question concerning whether the quantum power constant ScK , the quantum force constant f_{qk} , the frequencies f_{at} and $f_{C_{m1}}$ are related to each other.

Utilizing the concept of the vector magnetic potential \mathbf{A} coupled to another vector magnetic potential \mathbf{A} through a quantum power constant F_{qk} , we will eventually make a very important connection to the quantum potential (Q) as proposed by David Bohm whose work inspired the famous Aharonov-Bohm experiment. This experiment proved that the vector magnetic potential can affect an electrons wave function in the absence of the magnetic field that created the \mathbf{A} vector. *This concept will quite possibly reshape contemporary thinking as to the nature of force-fields.*

Let the following constants be established for those using the active Mathcad form of this book:

$m_e := 9.109389700 \cdot 10^{-31} \cdot \text{kg}$	Electron rest mass.
$q_o := 1.602177330 \cdot 10^{-19} \cdot \text{coul}$	Electron quantum charge.
$\mu_o := 1.256637061 \cdot 10^{-06} \cdot \text{henry} \cdot \text{m}^{-1}$	Magnetic permeability.
$\epsilon_o := 8.854187817 \cdot 10^{-12} \cdot \text{farad} \cdot \text{m}^{-1}$	Dielectric permittivity.
$r_c := 3.861593255 \cdot 10^{-13} \cdot \text{m}$	Compton electron radius.
$l_q := 2.817940920 \cdot 10^{-15} \cdot \text{m}$	Classic electron radius.
$c := 2.997924580 \cdot 10^{08} \cdot \text{m} \cdot \text{sec}^{-1}$	Speed of light in vacuum.
$\alpha := 7.297353080 \cdot 10^{-03}$	Fine structure constant.
$G := 6.672590000 \cdot 10^{-11} \cdot \text{newton} \cdot \text{m}^2 \cdot \text{kg}^{-2}$	Accepted gravitational constant.
$R_{n1} := 5.291772490 \cdot 10^{-11} \cdot \text{m}$	Bohr radius of Hydrogen.
$h := 6.626075500 \cdot 10^{-34} \cdot \text{joule} \cdot \text{sec}$	Plank constant.

These are the currently accepted values. The below constants are related directly to the theory of electrogravitation proposed by this author.

$V_{LM} := 8.542454612 \cdot 10^{-02} \cdot \text{m} \cdot \text{sec}^{-1}$	Least quantum velocity.
$f_{LM} := 1.003224805 \cdot 10^1 \cdot \text{Hz}$	Least quantum frequency.
$L_Q := 2.5729832158 \cdot 10^3 \cdot \text{henry}$	Least quantum inductance.
$C_Q := 3.861593281 \cdot 10^{-6} \cdot \text{farad}$	Least quantum capacitance.
$i_{LM} := q_o \cdot f_{LM}$ or, $i_{LM} = 1.607344039464671 \cdot 10^{-18} \cdot \text{amp}$	
(= Least quantum amp.)	

The quantum vector magnetic potential at the Bohr radius of Hydrogen is given below in equation (317) below.

$$(317) \quad A_{LM} := \frac{\mu_o \cdot i_{LM} \cdot \lambda_{LM}}{4 \cdot \pi \cdot R_{n1}} \quad \text{Or, } A_{LM} = 2.586378599815588 \cdot 10^{-17} \cdot \frac{\text{weber}}{\text{m}}$$

Adding the appropriate terms to generate a quantum magnetic force expression we arrive at the equation in (318) below.

$$(318) \quad F_{LM} := \left(\frac{\mu_o \cdot i_{LM} \cdot \lambda_{LM}}{4 \cdot \pi \cdot R_{n1}} \right) \cdot \left(\frac{i_{LM} \cdot \lambda_{LM}}{I_q} \right) = \text{Quantum Magnetic Force.}$$

or, $F_{LM} = 1.256184635325646 \cdot 10^{-22} \cdot \text{newton}$

Since the electrogravitational equation is composed in its basic form as $F_G = F_{LM} \cdot \mu_o \cdot F_{LM}$, then:

$$(319) \quad F_{EG} := \left(\frac{\mu_o \cdot i_{LM} \cdot \lambda_{LM}}{4 \cdot \pi \cdot R_{n1}} \right) \cdot \left[\left(\frac{i_{LM} \cdot \lambda_{LM}}{I_q} \right) \cdot \mu_o \cdot \left(\frac{i_{LM} \cdot \lambda_{LM}}{I_q} \right) \right] \cdot \left(\frac{\mu_o \cdot i_{LM} \cdot \lambda_{LM}}{4 \cdot \pi \cdot R_{n1}} \right)$$

or, $F_{EG} = 1.982973078718267 \cdot 10^{-50} \cdot \frac{\text{weber}}{\text{m}} \cdot \text{newton} \cdot \frac{\text{weber}}{\text{m}}$

Note that the above result can also be expressed as:

$$F_{EG} = 1.982973078718267 \cdot 10^{-50} \cdot \text{newton} \cdot \frac{\text{henry}}{\text{m}} \cdot \text{newton}$$

which is the same as the previous electrogravitational results for the force at the n1 radius of Hydrogen between two electrons.

Equation (319) above expresses a form that is at the heart of this chapter since it can readily be adapted to the the form of the vector magnetic potential as expressed by David Bohm. It is a total electrogravitational expression involving two separate vector magnetic potential systems coupled through a quantum force constant (F_{QK}) where that quantum force constant can be expressed by equation (320) below.

$$(320) \quad F_{QK} := \left(\frac{i_{LM} \cdot \lambda_{LM}}{l_q} \right) \cdot \mu_o \cdot \left(\frac{i_{LM} \cdot \lambda_{LM}}{l_q} \right)$$

$$\text{or,} \quad F_{QK} = 2.964371449283503 \cdot 10^{-17} \cdot \text{newton}$$

which is very nearly exact to the value of equation (315) previous. This value is herein defined as a universal force constant that is at the heart of the electrogravitational action. The **A** vector is a variable term since R_{n1} can be any value. R_{n1} is used only for the sake of convenience while working in the microscopic realm.

The simplified form of the electrogravitational expression may thus be stated below in equation (321) as:

$$(321) \quad F'_{EG} := A_{LM} \cdot F_{QK} \cdot A_{LM}$$

$$\text{or,} \quad F'_{EG} = 1.982973078718267 \cdot 10^{-50} \cdot \left(\frac{\text{weber}}{\text{m}} \right) \cdot \text{newton} \cdot \left(\frac{\text{weber}}{\text{m}} \right)$$

Notice how the units expression is of the form of the two system interaction and the weber/meter expressions are symmetrical about the constant newton expression. Thus even in the units, the two system interaction is symmetrical.

The **A** vector is inline with the motion of a standard (+) charge and therefore it is closely tied to a charged particles momentum. Momentum is then closely connected to a particles wave function which can be used to solve Schrodinger's wave equation. This will be examined shortly in light of Bohm's interpretation of the wave function controlling the energy potential of a particle.

First, it is interesting that we may derive a basic quantum frequency related directly to the least quantum electrogravitational force constant in equation (322) below.

$$(322) \quad f_{\text{QK}} := \frac{F_{\text{QK}} \cdot l_{\text{q}}}{h} \quad \text{or,} \quad f_{\text{QK}} = 126.0689469809949 \cdot \text{Hz}$$

$$\text{and,} \quad \frac{f_{\text{QK}}}{4 \cdot \pi} = 10.0322480412077 \cdot \text{Hz} = f_{\text{LM}}$$

This frequency (f_{QK}) may be worth looking for in the noise of the cosmic background radiation.

Perhaps the concept of non-local action and energy being gated into the electron (that causes it to move instantaneously to a new location in space) is contrary to some and just unfamiliar action to others. Quantum mechanics is counterintuitive to most people who see space-time as a continuum and find any other situation unacceptable. Quantum mechanics is however capable of demonstrating action at a distance, wave-particle duality, and other things that seem impossible until they are observed to have happened in spite of our common sense objections.

The concept of energy being supplied by the fine structure of the electron has also been theorized to exist by the late David Bohm, Emeritus Professor of Physics at

Birbeck College, University of London, England. Professor Bohm passed away in 1992. His work suggested that it is the wavefunction that guides and controls the electron and not the other way around. From his work, the Aharonov-Bohm experiment was initiated to prove that the vector magnetic potential (**A**) could affect an electron in a magnetic field-free volume of space. To be more exact, the wavefunction was affected which then changed the position of the electron in space.

The following quotes are from the book by David Bohm and Basil J. Hiley titled, "The Undivided Universe", Routledge, Chapman & Hall, Nov. 1993.

On page 37 the following is quoted from the above mentioned book as, "The fact that the particle is moving under its own energy, but being guided by the information in the quantum field, suggests that an electron or any other elementary particle has a complex and subtle inner structure." (This means that the energy that moves the particle suddenly from one point to another comes from the particle itself, and that energy is controlled by the form of the quantum wavefunction.)

The concept of "active information" is also brought forth wherein this active information tells the particle not only how to move, but where it is in relation to all the other particles in the universe.

I find this concept attractive since it fits so well with my own concept of all of the particles being tied together through their classic quantum radii by a singular point in imaginary energy-space. This singular point would be the energy source for the electrons motion in Bohm & Hiley's interpretation of quantum motion.

This same imaginary energy space helps supply the energy to displace the electron in virtual space which forms the "field" itself. (Every point is connected and is thus aware of all the other parts.)

Therefore, the analogy on page 38 of their book that a relatively weak radio wave controls what happens inside the complex structure of a radio serves to illustrate the active information process very well.

On page 57 of their book, Bohm & Hiley remark that, "two particles can also be strongly coupled at long distances." Further, "that the behavior of each particle may depend nonlocally on the configuration of all the others, no matter how far away they may be." This interpretation fits so well with my previous presentation of how all of the particles are connected to each other through their least quantum classic radii and imaginary energy space.

At the beginning of chapter three of their book, Bohm & Hiley present the equations that relate how the quantum potential is developed and applied to the motion of the electron. First, equation (3.1) of chapter 3 is presented which is Schrodinger's wave equation for a one body system:

$$(323) \quad \frac{i\hbar}{2\pi} \cdot \frac{\partial \cdot \psi}{\partial \cdot t} = -\frac{\hbar^2}{8\pi^2 \cdot m} \cdot \nabla^2 \cdot \psi + V \cdot \psi \quad (\text{Note: Eq. 323 thru 329 are not active Mathcad equations.})$$

where V is the classic energy potential. (Potentials usually are expressed in energy units.) They then solve the above equation for the case of $\psi = R \exp(iS / (\hbar / 2\pi))$. R is the amplitude potential $|\psi|$ of the wavefunction and S is the phase of the wavefunction expressed as $S = m \cdot v \cdot r$. Then equations (3.2) and (3.3) are the repeated solutions as shown below:

$$(324) \quad \frac{\partial \cdot S}{\partial \cdot t} + \frac{(\nabla \cdot S)^2}{2 \cdot m} + V - \frac{\hbar^2}{8\pi^2 \cdot m} \cdot \frac{\nabla^2 \cdot R}{R} = 0 \quad (\text{eq. 3.2})$$

and also;

$$(325) \quad \frac{\partial \cdot R^2}{\partial \cdot t} + \nabla \cdot \left(R^2 \cdot \frac{\nabla \cdot S}{m} \right) = 0 \quad (\text{eq. 3.3})$$

From the above in a few more steps they define the quantum potential as:

$$(326) \quad Q = - \left(\frac{h^2}{8 \cdot \pi^2 \cdot m} \cdot \frac{\nabla^2 \cdot R}{R} \right) \quad (\text{eq. 3.6})$$

The above quantum potential may possibly be related to the quantum force potential F_{QK} that I presented in (320) previously.

Now the stage is set for a very important equation of motion (3.8) presented in their book as equation (327) below:

$$(327) \quad m \cdot \frac{d \cdot v}{d \cdot t} = - \nabla \cdot (V) - \nabla \cdot (Q) \quad (\text{Note that del } (\nabla) \text{ is equivalent to } 1/r.)$$

Then $V/r = \text{force}$ and $Q/r = \text{force}$ also. In the above, there exists an irreducible quantum potential that can engender a quantum force potential. Note also that the force is (+) for the $-\nabla \cdot (Q)$ expression since Q is (-) in (326) above. This could cause a force of repulsion according to our previous definition of force.

I propose that what I have termed the F_{QK} force in equation (320) previous and Bohm's quantum potential force ($-\nabla \cdot (Q)$) of (327) above very intimately related, if not one and the same under certain circumstances. My equation is a special case of the above and applies specifically to the electrogravitational action.

It is apparent that the Q value is dependent on the rate of change of the wavefunction ψ and therefore can become very large. Then the quantum potential

depends only on the form and not the strength of the field. This is also brought out in their book. The quantum potential does not pull or push the particle directly according to their theory but instead controls the self-energy of the particle by an amount dependent on the information content in the particles co-joint wavefunction.

The Casimir effect is pointed to by Bohm & Hiley on page 38 of their book as a revealing source for the electron self motion. I prefer to call this energy-space, or virtual space, or even hyperspace, which feeds energy to the center of the particle.

For a excellent and relevant article on the Casimir effect the reader is referred to an article by Phillip Yam, "Exploiting Zero-Point Energy", *Scientific American*, December 1997:82-85.

The above presents the similarity between my equations of constant force potential F_{QK} and the equation of motion involving the Q potential of Bohm & Hiley. The end of chapter three of their book, (p.p. 50-54), presents the equation of motion involving the vector magnetic potential which also has a marked similarity to the F_{LM} equation (318) on page 180 previously presented in this chapter. Page 52 of their book has an additional Q term as stated before is the quantum potential. Their equation is:

$$(328) \quad m \cdot \frac{d \cdot v}{d \cdot t} + m \cdot (v \cdot \nabla) \cdot v = \frac{e}{c} \cdot v \times (\nabla \times A) - \nabla \cdot Q \quad (\text{Both sides} = \text{force})$$

Then even if there is no magnetic force, there still exists the quantum potential Q, which is also gauge invariant. If R is changing rapidly, the force will be large. This suggests that there is a rate of change of R that will be equal to my F_{QK} force constant of electrogravitation. I define F_{QK} as being a 'kernel' of force.

Equation (328) above may be expressed in the more familiar MKS units as:

$$(329) \quad m \cdot \frac{d}{dt} \mathbf{v} = q \cdot \mathbf{v} \times (\nabla \times \mathbf{A}) - \nabla \cdot Q \quad (\text{Note that } \nabla \times \mathbf{A} = \text{flux } \mathbf{B}.)$$

The above equation is the familiar equation of electromagnetic force on a moving charge of $F = q \cdot v \times (B) \sin \theta$ where $\sin \theta = 1$ at 90 degrees with the additional parameter of minus $\nabla \cdot Q$.

Under ordinary circumstances, the above equation has a Q potential value of nearly insignificant magnitude until the wavefunction interacts with another particles wavefunction. Then the classic magnetic force $q \cdot v \times B$ is reduced to zero and the Q value assumes the value that the classic magnetic force represented.

The interaction can be classified as a wavefunction collapse where now the Q potential is the instantaneous action parameter that I originally termed the F_{QK} constant force system interconnect potential. The Q potential carries the same force magnitude as information that lines up the interaction to an inline action. This guarantees that in most cases the electrogravitational interaction will always be maximum and inline. This is related to the quantum whole integer nature of quantum energy states in general.

The magnetic field generates the quantum Q potential but the quantum Q potential can exist in the absence of that engendering magnetic field. Its magnitude is a product of the rate of change of the interaction of its related wavefunction with another wavefunction. It can carry information instantaneously from the locale of a black hole when ordinary photons cannot. This is by reason that ordinary photons

need both a B field and E field to propagate. This limits the propagation velocity for photons to the velocity of light in free space. Then it is proposed that there is no way to shield this wavefunction from interacting with other particles wavefunctions under ordinary circumstances. This then becomes the electrogravitational action.

The F_{QK} force constant is equivalent to a power constant by multiplying the force constant by the speed of light c as shown below in equation (330).

$$(330) \quad S_{cK} := F_{QK} \cdot c \quad \text{or,} \quad S_{cK} = 8.886962032057239 \cdot 10^{-9} \cdot \text{watt}$$

The above power constant S_{cK} is equal to the value obtained in chapter 5, pages 104 and 105 wherein equation (207) predicted a possible connection particle for the electrogravitational force as well as for dark matter. Equation (203) on page 104 arrived at the same power as equation (330) above by a slightly different expression which tends to lend weight to the idea that there may be an energy in electron-volts that may be probed by a particle beam of equivalent energy to see if the gravitational force might be altered for particles surrounding the target. Equation (331) below re-derives the equivalent mass of this connection particle.

$$(331) \quad M_{S_{cK}} := \frac{S_{cK}}{f_{LM} \cdot c^2} \quad \text{or,} \quad M_{S_{cK}} = 9.856294176373425 \cdot 10^{-27} \cdot \text{kg}$$

The energy in electron volts to probe this equivalent mass is:

$$(332) \quad eV_p := \frac{S_{cK}}{f_{LM} \cdot q_o} \quad \text{or,} \quad eV_p = 5.528973146916985 \cdot 10^9 \cdot \text{volt}$$

This energy is well within the capabilities of present day accelerators. I therefore suggest that this energy realm may be investigated for this connection particle.

I propose that the least quantum force constant F_{QK} may be a major factor in the so called dark matter force that causes a force of attraction between stars in galaxies to be much greater than can be accounted for by normal gravitational computations based on the known amount of mass in the neighborhood of the stars.

Further, the apparent independent motion of galaxies of the cosmos may be a form of coherent action by the above F_{QK} constant force equation. The coherent wavefunction associated with the F_{QK} constant force kernels aligned in the same direction would cause all of the matter in a galaxy to be accelerated in just one direction.

Perhaps the ability to control the coherency of the wavefunction associated with Bohm's Q potential (which is closely associated with my F_{QK} potential) may allow for the construction of interstellar vehicles much like the UFO craft that have been observed in our own sky for thousands of years. A tap into a vast energy source may also be a possible benefit of such a science.

It was brought out previously that the rest mass of the electron could be derived from the least coulomb charge of the electron squared times the permeability of free space all divided by $4 \cdot \pi$ times the classic radius of the electron. This is repeated below in equation (333).

$$(333) \quad m'_e := \frac{\mu_o \cdot q_o^2}{4 \cdot \pi \cdot l_q} \quad \text{or,} \quad m'_e = 9.109389688253174 \cdot 10^{-31} \cdot \text{kg}$$

The mass of the electron may also be derived from the next equation involving the expression of 2 times the quantum fluxoid times the least quantum current all divided by the square of the electrogravitational velocity.

First we define the least quantum flux as: $\Phi_0 := 2.067834610 \cdot 10^{-15} \cdot \text{weber}$

$$(334) \quad m''_e := \frac{2 \cdot \Phi_0 \cdot i \cdot LM}{V_{LM}^2} \quad \text{or;} \quad m''_e = 9.109389661243303 \cdot 10^{-31} \cdot \text{kg}$$

The accuracy ratios to the actual electron mass m_e are:

$$(335) \quad \frac{m'_e}{m_e} = 0.99999999871047 \quad \text{and,} \quad \frac{m''_e}{m_e} = 0.999999995745412$$

Therefore, it is conclusive that the electron 'mass' is composed of a standing wave involving only the magnetic field energy. Then particle rest mass in general may exchange electrogravitational action energy or force by the F_{QK} force constant which is entirely magnetic, as in equation (320) on page 181 previous.

By now it has perhaps become apparent to some readers that if a wavefunction ψ can instantaneously move an electron from one location in space to another across arbitrary distances via the active information in that wavefunction, then a coherent macro wavefunction could en mass move many particles in like manner.

Another possibility that is suggested by the above equations is that of causing energy space to open up via gating the electron with a properly formed wavefunction and thus tap into the vast energy of energy space directly. This would indeed be a clean, reliable source of energy for all time.

There is even some evidence that the brain can interact on the quantum scale with its surroundings. There is an excellent article by Adam Frank, "Quantum Honeybees", *Discover*, November 1997: 80-87, in which it is conjectured in a serious manner that honeybees react with their surroundings in just such a fashion.

Even birds seem to have an uncanny way of navigating their surroundings that seems amazing even if we take into account the possibility of magnetite in their brains. (Even butterflies can do this magic.) Well, as the saying goes, "if the birds and the bees do it, then why can't we do it?" (I think that some people can do it.)

The field of theoretical quantum physics as applied to gravitation may have electrogravitation as a solution. The equations previously presented present a very strong case for the true nature of gravitation as being electrogravitational and also that research and experimentation along these lines will doubtless yield very large rewards for all of humanity.

The End

by

Jerry E. Bayles

A THEORETICAL UFO FIELD PROPULSION DESIGN

Chapter 12

By now many people have heard of the famous Roswell, New Mexico UFO 'saucer' crash and also about Bob Lazar who claims to have been involved in back-engineering a saucer type craft at the S4 area near Area 51 in Nevada. These events along with many other similar events involving UFO's indicate that these craft use some type of field propulsion system that is quite unlike known or conventional aircraft propulsion systems. This chapter will explore a possible design for field propulsion based on a mix of quantum and classical electronic field action.

The Testor Corporation has provided a 1:48 scale model (No. 576) of the flying saucer that Bob Lazar claims to have worked on. For the purpose of a beginning design platform, I am going to assume that a lot of the design features are fairly accurate as described by him and incorporated in the model itself. This is also by reason that it fits well into my own requirements for a craft design that would best fit the theoretical electrogravitational field generation characteristics.

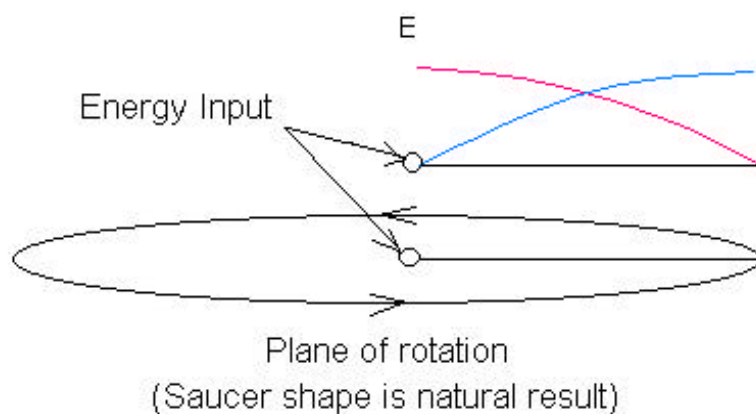
Electronics is defined by Websters Collegiate Dictionary as a branch of physics. Since physics is a study in the broadest scope related to the understanding of nature it is natural that we narrow our research to an area of physics that has the most in common with the field of electronics. This is the quantum field of de Broglie and Schrodinger as applied to particle/wave action and this will be blended with conventional electronic wave theory.

There are many parallels in the macroscopic electronic and quantum particle/wave theories such as standing waves, phase and group waves, wavelength, to name but a few. In fact, *electronics* is a science based on a *particle*, the electron.

The first consideration towards building a field propulsion system would likely be to allow for it to have a very strong field. Now most electromagnetic fields radiate so that in order that a strong field be achieved, it also must be fed a continuous amount of energy in the form of power from a reliable source. This has many drawbacks. If a field radiates, it tells everyone in the vicinity that you are there. Further, it is very wasteful concerning the loss of power to free space.

A good way to build a strong local non-radiating electromagnetic field is to build it as a standing wave. The electromagnetic standing wave field does not radiate. Also, very intense fields may be achieved since the field may be allowed to build through the use of flywheel *kicker* action that adds power to the returning wave at just the right time. This action would be repeated until the voltage/current peaks and nodes achieve the desired amplitude. If the shorted-end version of transmission line were used to produce standing waves, the current would be maximum and the voltage minimum at the shorted end of the line. Further, if we now rotate this shorted end about the location of the input of the line such that the short travels 360 degrees around the input to the transmission line, a saucer shape is the result. Therefore, the E-field is the defining shape for a saucer even if there is no body apparent. See figure #12 below for clarification.

Figure 12



A standing wave field that has a large E field will tend to ionize the air at the surface of the craft, causing it to glow. (E is volts in this case and I is in amps.) Of further interest is that in my previous work I defined mass as the result of quantum standing waves. Therefore, a craft surrounded by such a field may be likened to a very large particle. As such, it may be acted on by David Bohm's information potential and act as a quantum particle subject to non-local action, acted on by remote quantum actions and instantly displaced to other locations in space.

Equation (334) on page 190, (this book, "Electrogravitation As A Unified Field Theory"), is repeated below as equation (336) to show that **mass** may be directly related to the **field** characteristics as described for the UFO above.

$$336) \quad m''_e = \frac{2 \cdot \Phi_o \cdot i_{LM}}{V_{LM}^2} \quad \text{where } \Phi_o \text{ has the units of volt x time.}$$

Then, mass is equivalent to volts x time x current all over the square of velocity. More specifically, the square of the magnetic quantum velocity V_{LM} . We will return to a direct application of this velocity later as we set the standing wave field in motion around the surface of the craft. (In the same plane of rotation as figure 12 shows.)

I ask the reader to imagine that the top and bottom of the craft is now divided into 12 segments and that these segments are equivalent to electromagnetic power transmission waveguides that are capable of coupling to the surface of the craft the waves contained within each waveguide. Further, the power in these waveguides is sequentially switched at the speed of light through a small radius such that the much larger radius of the saucer effectively moves in simulated rotation much faster than the velocity of light. This perimeter velocity will be termed the phase velocity, V_p .

The group velocity V_G is also termed the group velocity V_{LM} . The terms phase and group velocity are familiar terms both in the quantum and classical wave theory sense. Page 832 of "Modern University Physics"¹ states the formula derived by de Broglie for phase velocity related to the quantum domain as:

$$337) \quad v_p = \frac{h}{m \cdot v} \cdot \left(\frac{m \cdot c^2}{h} \right) = \frac{c^2}{v} \quad \text{where } v \text{ is the group velocity.}$$

The total energy of a particle, mc^2 , is equivalent to hf and thus the frequency of the associated wave is equal to $f = mc^2 / h$. Also, the de Broglie wavelength of a particle is $\lambda = h / mv$ where λ is the wavelength of the associated wave. The resultant phase velocity $v_p = \lambda f$. In equation (337), v is the velocity of the particle, which must be less than the velocity of light, c . However, the velocity of the associated phase wave does exceed the velocity of light. This is an accepted quantum physics reality.

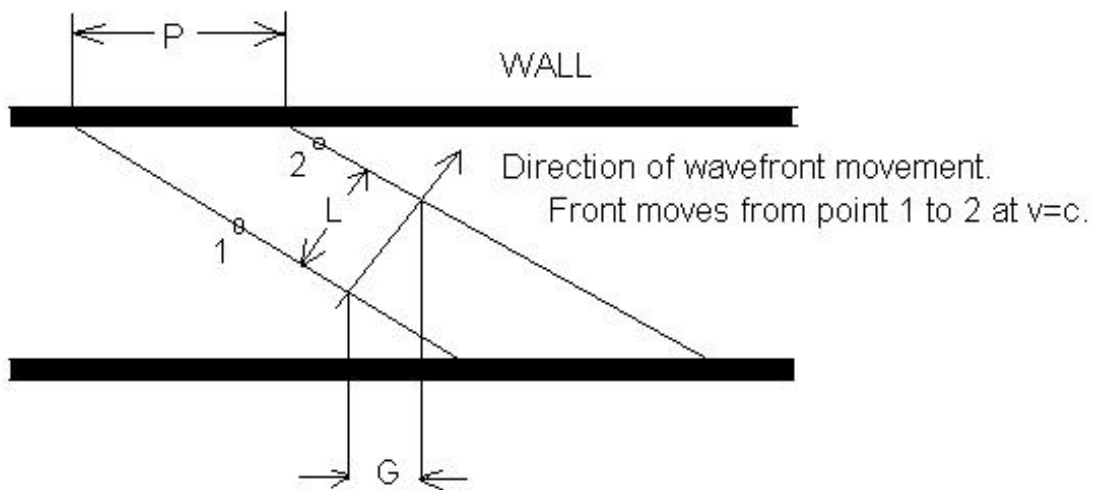
The following is a direct quote from the above mentioned book.¹ On page 603 it is stated, "*a wavefront is the locus of points where the waves have the same phase, and the phase velocity is the velocity of propagation of these surfaces of common phase.*" On page 833 of the above mentioned book, it is mentioned that Schrodinger considered that it was possible to replace Newtonian trajectories with his wave mechanics. His wave equation is testimony to that belief. His wave equation for a particle is the analogy to Maxwell's equation describing the propagation of light.

¹ Modern University Physics by James A. Richards, Jr., Francis Weston Sears, M. Russell Wher, and Mark W. Zemansky. Publisher: Addison-Wesley Publishing Co., Reading, Mass., Palo Alto, and London. Copyright 1960, 2nd printing Mar. 1964.

Phase and group velocity also occurs inside of a waveguide where the axial group velocity travels down the waveguide slower than the velocity of light while the velocity of propagation at the wall of the guide appears to exceed the velocity of light.

Figure 13 below is presented to illustrate this concept.²

Figure 13



The wavefront moves down the guide through distance G which is directly related to the associated group axial velocity V_G while the wavelength measured across P at the top of the guide is greater than it would be in free space. This is directly associated with the phase velocity V_P . The mathematical expression for these three velocities in the waveguide is expressed by equations 338(a) & (b) below.²

$$338) \quad a. \quad V_L = V_c = \sqrt{V_P \cdot V_G} \quad \text{and,} \quad b. \quad c^2 = V_G \cdot V_P$$

(Where $V_G = V_{LM}$.)

² Figure 13 and equation 338b are partial quotes from Air Force Manual 52-8, Vol. Two, "Electronic Circuit Analysis", U. S. Gov. Printing Office, Washington 25, D.C., 15th. January 1963.

Equation (338b) is the same as equation (337) previous which was the statement for a particle concerning its three velocities in quantum space. Therefore, the waveguide case for the electromagnetic wavefront and the quantum particle wavefront must have a very close tie to each other. In fact, it may be possible to harmonize them such that they work together under the action of a properly designed control mechanism.

The waveguides mentioned previously are arranged radially from near the center of the saucer to the outside perimeter where the maximum current nodes are formed. The input to the waveguides is from a waveguide demultiplexer that switches the electromagnetic energy into each waveguide input in ring fashion. Also, the circumference of the demultiplexer perimeter operates very near the velocity of light in free space. There are no moving parts in the demultiplexer. Switching could be done by transverse magnetic fields from port to port sequentially.

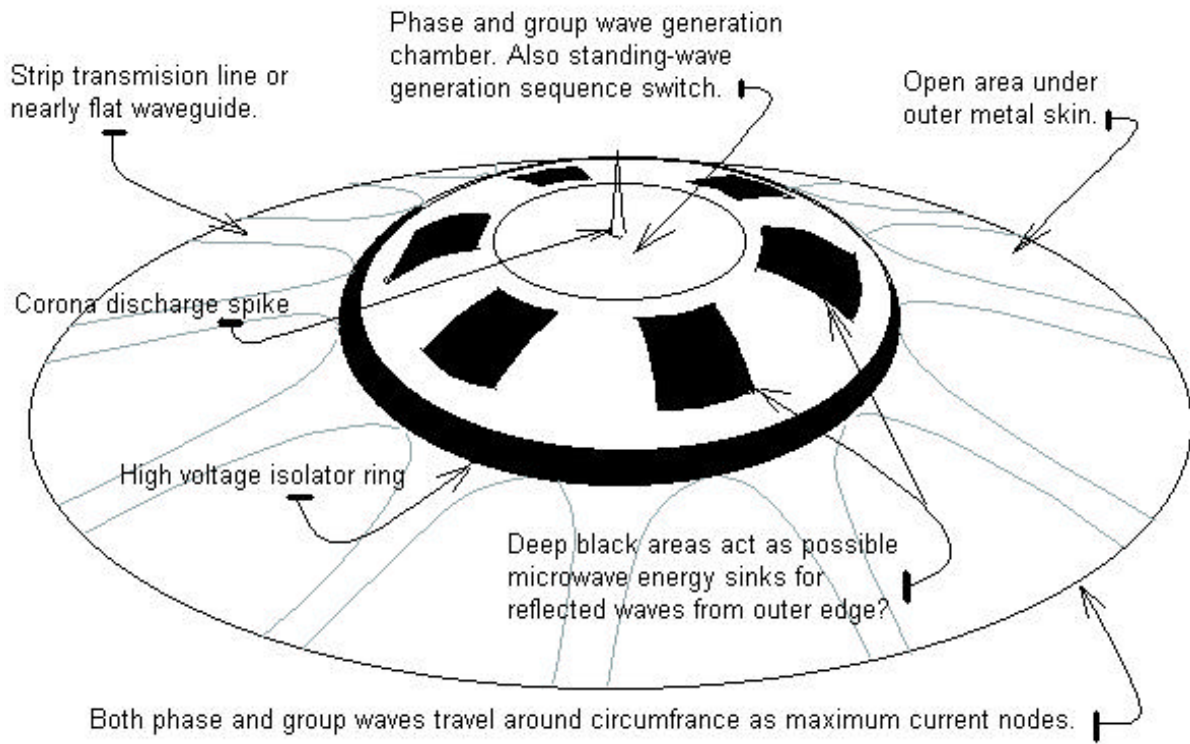
The control of the sequencer would most likely be done by a preset programmed computer since rapid adjustment and control may be needed to keep the standing waves at the proper magnitude and phase.

The energy input could come from the antimatter reactor as described by Bob Lazar since the output would be a very fast rise pulse/frequency in the gamma-ray spectrum. A very fast rising electromagnetic photon pulse would allow for the capability of providing a standing wave kicker action into above visible light regions of standing wave frequencies as well as for the fastest demultiplexer speeds possible. (A kicker action is like spinning a bicycle wheel with your hand. The speed is limited to how fast you can move your hand over the circumference of the wheel. A very fast hand motion is equivalent to a fast risetime and thus a faster wheel-spin.)

Figure 14 below is a sketch of the topside of the saucer showing the waveguides placement.

Figure 14

The transmission lines are shown exposed but are under an outer metal skin that is a ground plane.



Testors S-4 Area "Sport Model" UFO Reproduced As A Sketch Above.

Bob Lazar mentions that antimatter is generated from element 115 and reacted with a gas to provide a complete complete annihilation process. This converts the element 115 to element 116. (This of course is a fusion process.) It is also nearly 100% efficient. If true, this would be wonderful to say the least. Unfortunately we do not have access on Earth to element 115 as a naturally occurring element. However, we can produce positron emission from certain elements when those elements are bombarded with protons. These emissions could then react with ordinary gaseous matter to provide gamma-ray bursts of energy.

The standing waves coupled to the outside of the craft would build in intensity over time to become a very powerful non-radiating field with the general shape and characteristics shown in figure 12 previous. This field is then set in rotating motion around the perimeter of the saucer that would move at an apparent velocity equal to a phase velocity V_P that would then generate the group velocity V_{LM} . This would be accomplished by *fanning* waveguide demultiplexing as explained previously.

The apparent motion of the intense pulsed current nodes at the perimeter of the craft would generate a very powerful magnetic field in our real space that would have its field perpendicular to the plane of current node rotation, i. e., vertically if the plane of the saucer were horizontal. This would be attributed to the V_{LM} wave. It would also generate a magnetic field in phase space. That would be attributed to the phase wave, V_P .

One of Maxwell's findings was that the relationship of the E field to the B field could be stated as $E = cB$, where c is the velocity of light. (E is in volts/meter and B is in weber/meter².) This can be also shown as $E^2 = c^2B^2$ by squaring both sides. Now $c^2 = V_P \times V_{LM}$ so that we can arrive at an expression for two values of B. One in real space and one in imaginary space. Equation (339) below is the result.

$$339) \quad \begin{array}{cc} \text{Real} & \text{Imag} \\ E^2 = (V_{LM} \cdot B_{LM}) \cdot (V_P \cdot B_P) & \text{(We assume E to be controlled.)} \end{array}$$

Now, If we hold E in the standing wave to be controlled and 'set' then as V_{LM} and V_P move away from c , (B_{LM} will increase and B_P will decrease. Again, the increase in B_{LM} is dependent on the saucers current node switching rate around its perimeter which is equivalent to phase velocity, V_P .)

B_{LM} will increase due to the fact that current is charge per unit time. The high charge density at the current nodes being switched faster around the perimeter of the saucer represents a charge velocity V_P increase and thus a B_{LM} field increase due to the higher charge per unit time. As far as the space around the saucer is concerned, it 'sees' the current nodes at the end of the waveguides as regions of high charge density. Further, these regions being switched sequentially around the perimeter is seen as current.

The frequency/switching rate around the perimeter of the saucer is much faster than the frequency related to the standing-wave ΔE -field frequency. This forms an equivalent phase wave velocity V_P which will thus have an associated group wave velocity V_G in the same direction. Note that $V_G < c < V_P$ always.

This B_{LM} field forms a torus around the perimeter of the craft with the strongest portion of the field being through the center of the saucer. There is another B field on the surface of the saucer, associated with the voltage standing waves ΔE which extend from the corona discharge spike (top center) to the perimeter of the saucer at each switched current node.

This additional B field is parallel to the surface of the saucer and forms circular B field rings that build in intensity as they become closer to the top of the saucer where the changing E field has its maximum potential and rate of change. This second B field is the result of the fact that a changing E field generates a changing B field 90 degrees to that ΔE field and vis versa. This second B field is also 90 degrees to the B_{LM} field which is perpendicular to the surface of the craft. The second B field is defined as the ΔB field.

Equations (337) and (338b) previous present the possibility that there is a strong parallel between the group and phase velocities in waveguides and quantum particles. In fact, it is therefore postulated that space may create a waveguide shape around quantum particles and further that the transfer of quantum energy and information via quantum waves will follow many of the same rules as waves do in a conventional electronic waveguide. Page 39, equation (89) of this book gave the equation for the quantum ohm constant in terms of the derived electrogravitational inductance and capacitance. This formula is repeated below as equation (340).

$$340) \quad Z_Q = \sqrt{\frac{L_Q}{C_Q}} \quad \text{or,} \quad Z_Q = 2.581280560 \cdot 10^{04} \cdot \text{ohm}$$

This equation is a standard transmission line impedance formula that is related to waveguides also. This again strongly suggests that the quantum ohm constant is directly related to waveguide-like parameters and spatial geometry. The quantum ohm is to the wave nature of particles as the free space resistance is to electronics of the waveguide and transmission line theory of today. There exists a direct link between the two which is expressed as equation (341) below.

$$341) \quad R_S = 2 \cdot R_Q \cdot \alpha \quad \text{where } R_S = 376.7303129 \text{ ohm} = \text{standard constant.}$$

Thus, the free space resistance, R_S , equals two times the quantum Hall ohm times the widely applicable quantum fine structure constant. Also, a direct link is established between electronic and quantum space by the quantum fine structure constant. Therefore, the phase and group velocities around the perimeter of the saucer form a spatial waveguide for both the quantum and classic waveguide action.

Page 11-16 of the book in reference 2, page 196 previous, contains a very interesting set of waveguide equations that contain expressions that in part strongly resemble the Lorentz transform expression from special relativity. These are shown next as equations (342) and (343).

$$342) \quad \text{First,} \quad \frac{V_G}{V_C} = \sin(\theta) = \sqrt{1 - \left(\frac{\lambda}{2 \cdot B}\right)^2}$$

B is the inside wide dimension of the waveguide and λ is the wavelength in free space inside the waveguide. V_G is the group velocity and V_C is the velocity of light.

$$343) \quad \text{And also,} \quad \frac{\lambda_G}{\lambda} = \frac{1}{\sin(\theta)} = \frac{1}{\sqrt{1 - \left(\frac{\lambda}{2 \cdot B}\right)^2}}$$

Solving for the $(\lambda/(2 \cdot B))^2$ expression in equation (342) and placing this in equation (343), we arrive at the below equation (344). Note that λ_G is NOT related directly to the group velocity V_G but is the actual wavelength in the waveguide and is proportional to the phase velocity V_P . Henceforth, $\lambda_G = \lambda_{\text{Guide}}$.

$$344) \quad \frac{\Delta \lambda_{\text{Guide}}}{\lambda_C} = \frac{V_C}{\Delta V_G} \quad \text{Where } V_C \text{ and } \lambda_C \text{ are constants.}$$

Then, since $\Delta V_G = c^2 / \Delta V_P$, as ΔV_P approaches infinity, ΔV_G approaches zero. This causes the wavelength in the guide, λ_{Guide} , to approach infinity. The point to all of this is that the effective current length around the perimeter of the UFO increases. This will increase the B_{LM} field. This is readily shown by equations (345) and (346) on the next page that express the flux density B_C for a flat coil of ΔN turns which is the equivalent of the current ring around the perimeter of the saucer.

$$345) \quad \Delta B_C = \frac{\mu_o \cdot \Delta N \cdot i_c}{2 \cdot r} \quad \text{where, } \Delta N = \frac{\Delta \lambda \text{ Guide}}{2 \cdot \pi \cdot r} \quad \text{and } i_c = \text{current in nodes.}$$

$$\text{Then; } \Delta B_C = \frac{\mu_o \cdot \left(\frac{\Delta \lambda \text{ Guide}}{2 \cdot \pi \cdot r} \right) \cdot i_c}{2 \cdot r} \quad \text{which simplifies to:}$$

$$346) \quad \Delta B_C = \mu_o \cdot \frac{\Delta \lambda \text{ Guide}}{4 \cdot \pi \cdot r^2} \cdot i \quad (\Delta \lambda \text{ is looping perimeter while increasing.})$$

Then, according to equation (346) above, not only will an extremely large B field be generated as the phase velocity around the perimeter of the saucer approaches infinity, but the equation itself defines the generation of the increasing current around the perimeter as being dependent on the increasing phase velocity, ΔV_p . This is likened to an **acceleration**, which may then be related to Newton's force equation, $F = \text{Mass} \times \text{Acceleration}$. which by Einstein's equivalence principle is related to $F = GM_1M_2 / r^2$.

Since the field around the saucer resembles that of a very large electron, we may be able to apply David Bohm's Quantum Potential (equation 327 of chapter 11) in such a way as to cause the entire saucer (now a macro quantum particle) to go nearly instantly to a new space location. Then a simple phase change instead of amplitude change may instantly affect where the saucer is spatially. This invokes the hidden energy potential, Q, which is part of the quantum construct of the electron.

Perhaps we can also tap into this vast energy field and use it to power whatever we need. This also may require careful adjustment or Tunguska could happen again. Also, it may be that some of the reported saucer crashes are the result of failures of the saucer field generation mechanism.

The Q potential power source is many orders of magnitude greater than anything fission or fusion could supply, gram for gram. (See equation (376) on page 220 where the power density potential was shown to be in the range of 10^{29} watts / meter². This is a very large amount of energy.) It is possible by the action of chaos theory or just uncertainty that there may be Tunguska type explosions going off throughout space due to loss of proper information phase. (Verifiable by gamma ray bursts at random locations in space.) Thus a sudden burst of an uncontrollable amount of energy may occur through the quantum Q potential going haywire for an instant. If so, this could have disastrous results on any scale for affected civilizations.

Since there is suggested by the foregoing theory of saucer field generation a very strong B field, is there evidence through reported sightings of such a magnetic field associated with such craft? The answer is yes. The book, "Project Blue Book",³ on page 197 stated the following; *"One observer (incident 68) noticed a violent motion of a hand-held compass. If we assume from this that the objects produced a magnetic field, comparable with the Earth's field; namely, 0.1 gauss, and that the observer found that the object subtended an angle θ at his position, then the ampere-turns of the required electromagnet is given by:*

$$347) \quad n \cdot i = \frac{30 \cdot R}{\theta^2} \quad \text{Where } R \text{ is the range of the object.}$$

³ Project Blue Book, Edited by Brad Steiger, Ballantine Books, 9th. printing, August 1990.

For instance, if R is 1 kilometer and the object is 10 meters in diameter, then $ni = 1$ billion ampere-turns." Also is quoted just below the above quote, "These figures are a little in excess of what can be conveniently done on the ground." (A real understatement!)

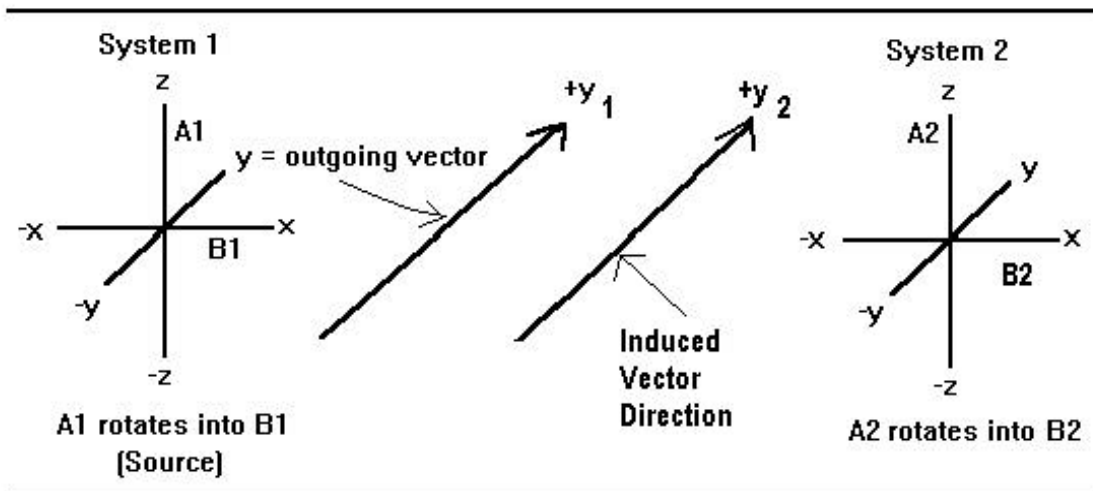
Further, there have been numerous instances of cars stalling due to their electrical systems shutting down when near UFO's. A strong pulsating magnetic field, (pulsating since it is alternating between building in strength and then instantly resetting, etc.), can disrupt electrical circuits, period. (Sunspots are strong evidence for this phenomena). UFO field interference has happened to aircraft and even may have contributed to electrical power grid blackouts. Yet, they may not emanate an r. f. electromagnetic signal due to the fact that the ΔE and ΔB fields are standing-waves.

The mechanism of the electrogravitational interaction above is presented as evolving from a sequenced current node that is representative of what has been presented before in figure 9, page 145. However, I will now define the force of attraction as a (+) force while a (-) signed force is now defined as a force of repulsion. This will allow for the mechanism of quantum magnetic induction that will cause a force of attraction, much like a regular magnet is attracted to iron or steel. Thus the vector force in system 2 will be in the same direction as system 1 in figure 9, page 145.

The next page will again present equation (319) of page 180 and a new drawing, figure 15, that will serve to clarify the electrogravitational mechanism. The equation has a shape that suggests wings on either side of the permeability constant, μ_0 .

The next figure is redrawn from figure 9 on page 145. It shows the case for two-system attraction for each other by information induction from system 1 to system 2. Then, as a result, all related quantum currents are parallel.

Figure 16



System 1, rotation is Z into X.

$$(349) \quad A1 := \begin{pmatrix} 0 \\ 0 \\ 1 \end{pmatrix} \quad B1 := \begin{pmatrix} 1 \\ 0 \\ 0 \end{pmatrix}$$

Vector cross-product of system 1 is:

$$(351) \quad \text{Sys1} := A1 \times B1$$

$$\text{Sys1} = \begin{pmatrix} 0 \\ 1 \\ 0 \end{pmatrix}$$

System 2, rotation is Z into X also.

$$(350) \quad A2 := \begin{pmatrix} 0 \\ 0 \\ 1 \end{pmatrix} \quad B2 := \begin{pmatrix} 1 \\ 0 \\ 0 \end{pmatrix}$$

Vector cross-product of system 2 is:

$$(352) \quad \text{Sys2} := A2 \times B2$$

$$\text{Sys2} = \begin{pmatrix} 0 \\ 1 \\ 0 \end{pmatrix}$$

The total product of system 1 and 2 will yield the sign of the unit-scale electrogravitational action as:

$$(353) \quad F_{g1} := \text{Sys1} \cdot \text{Sys2} \quad \text{or,} \quad F_{g1} = 1 \quad (+) \text{ sign} = \text{attraction.}$$

So far the area of the saucer has been limited to the upper section and surface. The saucer as described by Bob Lazar also has a central area and a lower section. The central section contained three seats that only persons of small size could sit in and immediately behind each seat was a console that he termed the *gravity amplifier*. The seats and gravity amplifiers were equally spaced in a triangular arrangement around the bell shaped antimatter reaction chamber on the central floor. Extending from this antimatter reaction chamber is a waveguide that leads directly to the upper section that was just previously considered.

Directly below the central section is the lower section that has 3 cylinders, each of which is connected to its corresponding gravity amplifier console in the central section through a flexible waveguide segment. Inside of each cylinder is 6 ring segments stacked on top of each other where alternate rings have first 6 and then 8 equally spaced knobs of some same purpose. Bob Lazar calls the whole assembly, (central deck consoles and lower segmented cylinders), "gravity amplifier assemblies".

They supposedly cause space to warp in Einstein's General Theory fashion to connect points widely separated in normal space together in curved space and then the saucer simply pops out in a new far away point when space returns to normal.

My first objection to this interpretation is that all of space would go along for the ride. Also, the energy that would be required to accomplish this feat would be more than is available from any black hole so far observed. This kind of action in the region of our Earth would undoubtedly cause a local disaster, perhaps not only to our Earth but even to our galaxy. I therefore cannot agree with the proposed engineering mechanics as put forth by Bob Lazar.

I must therefore respectfully suggest that a quantum electronic solution is not only much less destructive of the locale around the saucer, but can provide the maximum force-action concerning the movement of the saucer with a minimum of negative interaction with the local Earth inhabitants. (Not to mention that far less energy is expended to accomplish the desired result.)

The geometrical arrangement of the 6 ring segments stacked on top of each other where alternate rings have first 6 and then 8 equally spaced knobs is interesting. It may be that this arrangement allows for the building of a force field that is fundamental to the construct of all matter. It is the angle of interaction between the hexagon and octagon arrangement of disks as well as the number of each type, namely three, that points to a very fundamental arrangement that also occurs in molecules.

The shape and angles between constant particles in atoms that make up molecules should influence the shape of the molecules. Put another way, the fundamental nature of particle force fields will make their shape apparent through the molecules that they construct. A good example is the water molecule.

When frozen, the water molecule forms a six molecule ring with the angle between each connection forming 60 degrees. When considered alone, a single atom of Oxygen is connected to two atoms of Hydrogen spaced 120 degrees apart around the atom of Oxygen and the whole forms the molecule of water, H₂O. This is an indicator of a fundamental shape to the particle field of the electron. If a trine is formed between lines drawn from the center of the saucer to each gravity amplifier, the legs of the trine are separated by 120 degrees. Further, the fundamental integer that may be associated with the construction of the saucer is the number three. (Three-hundred sixty degrees divided by three is one hundred twenty degrees.)

Next, if the inside angle of the octagon, (45 degrees), is subtracted from the inside angle of the hexagon, (60 degrees), we arrive at the difference of 15 degrees. Multiples of this angle by integers allows for angles of 30, 45, 60, etc., degrees which likely allows for most angular combinations of molecular configurations. Further, if the appropriate angular phasing is employed between inline stacks of disks in each cylinder in groups of three, a downward projected force field may occur.

Also, if each gravitational field cylinder were to interact with the adjacent gravitational cylinder and be phased properly, a downward and outward vortexed mass-field may be the result. This could even be phased with the overall electrogravitational standing wave field on the top and bottom surface of the saucer to allow for better control and perhaps for a stronger field in both cases. Each of the "pods" that are located around the disks of each cylinder is most likely a waveguide window that beams out a microwave pulse of energy.

The phasing and timing of each pod is also likely to be controlled by the console *electronics* located at the other end of the waveguide on the main floor. Proper control may allow for a sharp focus of the mass-beam so that *crop circles* could be accomplished very quickly. (A little more sophisticated than the Earthbound copycats could ever create and a whole lot faster.) The energy in the beam has a microwave component and could leave evidence of such which the pretenders could not duplicate. (Such as darkened roots, and partially cooked stems.)

So there we have it. The saucer is constructed to look and act like a very large particle. Secondly, its construction implies a profound understanding by its creators of the fundamental shape and nature of the elemental force fields associated with the most basic mobile electric particle, the electron.

What about the occupants who control such a craft? What might their nature be as to their construct? It is doubtful that they are essentially human. They are likely much more in tune with the craft that they operate. It is possible that they are a part of it and it is likewise a part of them. Looking at where they sit, it is possible that they derive energy from their surroundings by induction from the consoles or from the "chairs" that they sat on. This would tend to keep them close to their craft lest they be starved for energy.

I am reminded of the comment by a firsthand witness to the Roswell crash that claimed that at least three 'aliens' were alive and clutching suitcase-like boxes to their chests. These boxes may have been emergency power sources for these beings. Also, the autopsy film related to that crash showed a rather large squarish 'organ' being removed from the upper torso of one of the deceased beings. Might this be a power pack that was recharged by field induction?

The idea of *control by consensus* comes to mind concerning the operation by three beings of a craft such as this. The mass field generation system could probably deliver quite a punch if need be. It may not be possible to shield against it. This kind of power in the hands of one being could be harmful, if used improperly. We humans, for instance, have a launch by consensus system for launching nuclear weapons.

Evidently, the long range plan is not to harm us, or they would have most certainly done it by now. Judging by recorded history, the saucer phenomena has been around for thousands of years. (Not the least of which is recorded in the book of Ezekiel in the Old Testament.) We are evidently being watched by more than a few of these beings and for more than a little while.

Electrogravitational field generation through carefully controlled standing waves and phase velocities greater than the velocity of light may create a macro quantum particle, a saucer, also at times termed ufo. Utilizing the wavefunction (ψ) associated with quantum particles, David Bohm postulated that it was the information in that wavefunction that controlled the location of the particle in space. Further, the wavefunction gated or controlled the particles own nearly unlimited self-energy which provided the energy necessary to instantly move it to a new spatial location. This is a more efficient way of moving anything around than any way we know of today.

The wavefunction related to the saucer could be changed by causing the field around the saucer to become asymmetrical in its energy density. That is, to have a differential in field strength across the plane of the saucer. This is equivalent to causing a phase change related to the macro-particle condition of the saucer. This could be done easily and almost instantaneously. The saucer would then 'jump' to a new position in space.

I feel that we could build such a craft, if we devoted some time and money towards doing so. Perhaps a group of people interested in such a project could be formed and resources could be pooled in the attempt to build humanities first electrogravitational spacecraft. I hope to see it accomplished in the near future.

The End

by

Jerry E. Bayles