Quantum Vehicle Propulsion

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Abstract. This paper presents a solution of what gravity is and a method of building a vehicle that uses quantum principles to cause that vehicle to jump through space much as an electron jumps through space. While this is not a new idea, the methodology to achieve this has not been forthcoming until now. The formulae presented in this paper are based on a new science created by this author wherein the gravitational action is defined both in quantum mechanical and electrodynamic terms.

QUANTUM ENERGY DYNAMICS

It has long been established that the electron, (as well as other basic quantum particles), can somehow move from one point in space to another instantaneously. They can tunnel through matter to show up on the other side, also instantaneously. This is observed for instance in the jumps to higher or lower energy levels inside the atom when stimulated by external electromagnetic energy and when electrons "tunnel" through an energy barrier to suddenly show up on the other side. Einstein labeled this as "spooky action at a distance" since it did not fit into his idea that space time had to be everywhere continuous and differentiable.

The late Professor Emeritus David Bohm of Birbeck College, London England, solved Schrodinger's wave equation for a quantum energy potential, Q, that represents the self energy of the electron that is determined by the interaction with the phase of it's associated pilot wave. This quantum self energy potential is potentially infinite and is capable of instantly placing the electron at a point anywhere in normal space. The formulas I have developed not only define the actual structure of the electron but parallel David Bohm's concept of infinite potential energy being controlled by a phase shift of the parameters that make up the electron. David Bohm's equations are presented immediately below and my electrogravitational equations are presented thereafter.

Bohm (1995) defines the particle as, "never being separate from a new type of quantum field that fundamentally affects it." The field is:

$$\psi := R \cdot e^{\left[i \cdot \frac{S}{\left(\frac{h}{2 \cdot \pi} \right)} \right]} \qquad (1)$$

where R, S and h are defined in the nomenclature section at the end of this paper. The quantum energy potential is given by eq. 2 below as:

$$Q := -\left(\frac{h^2}{8 \cdot \pi^2 \cdot m} \cdot \frac{\nabla^2 \cdot R}{R} \right) \qquad (2)$$

David Bohm's quantum potential Q, is capable of infinite energy, which is controlled by the phase related to an electron's wave function. This is equivalent to the energy space derived input of my own theory.

The equation that satisfies a system of particles is:

$$\frac{\partial S}{\partial t} + \frac{(\nabla S)^2}{2m} + V + Q := 0 \tag{3}$$

According to equation 3 above, the quantum energy potential Q, (in the absence of any atomic potential energy (V), is controlled solely by the phase parameter S, (the momentum times the radius). This is the foundation for his equation of motion in eq. 4 below:

$$m\left(\frac{dv}{dt}\right) := -\nabla(V) - \nabla(Q) \tag{4}$$

Equations 1 through 4 above are from p. 29 of Bohm (1995).

Along with his famous quantum potential equation and equation of motion, the idea was presented by him that there existed a vector magnetic potential **A** apart from the field of magnetic flux that created it. This was demonstrated by the famous Aharonov-Bohm experiment. The equation that relates the vector magnetic potential to the quantum potential Q is given by the below equation (Bohm, 1995).

$$m\left(\frac{dv}{dt}\right) := qv \times (\nabla \times A) - \nabla Q \tag{5}$$

The fact that the vector magnetic potential can exist apart from the B field that creates it means that the vector magnetic potential cannot be shielded against. Thus, it implies that it has a connection to the mechanics of gravitation which seems to penetrate and interact with all forms of energy.

The physics related to David Bohm's quantum potential and the Aharonov-Bohm effect have been presented above to introduce my own extended concept of quantum energy and the mechanics of gravitation which I call Electrogravitation. The source of the energy that created the big bang is likely still there and I call it energy space. Further, I suggest that energy space is the source of David Bohm's quantum potential Q energy.

Quantum Electrogravitation and Propulsion

Below is presented the fundamental form of my quantum equation of Electrogravitation which yields the same absolute magnitudes of force, (proportional to $1/r^2$), as Newton's standard gravitational equation.

$$F_{GQ} := \left(\frac{hf}{r}\right) \cdot \mu_o \cdot \left(\frac{hf}{r}\right) \tag{6}$$

The right-hand terms in eq. 6 are expressed as the quantum energy in one initiator system (or particle) times the permeability of free space times the quantum energy of a receptor system (or particle). This can be expressed in many ways as long as it is realized that the equation expresses energy per meter times the permeability of free space times energy per meter. The result is expressed in newton squared times henry per meter. It is obvious that my new gravitational equation has an extra newton term as well as the permeability of free space in the result. What we have interpreted up to now is only a newton term as the result. Thus, the equation 6 above reveals heretofore hidden parameters that still yield a force falling off as $1/r^2$. An equation that expresses the mechanics of the vector magnetic potential and still yields the same result as equation 6 above is shown below in eq. 7.

The force constant is a new quantum constant expressed in newton units. The wavelengths and currents are my own derived constants .

Equation 7 below incorporates the vector magnetic potential (**A**) and the new quantum force constant.

(**A**) variable weber/meter | Force constant |----------constant newton---------| (amp) (amp) | (**A**) variable weber/meter

$$F_{EG} := \left(\frac{\mu_o \cdot i_{LM} \cdot \lambda_{LM}}{4 \cdot \pi \cdot r_x}\right) \cdot \left[\left(\frac{i_{LM} \cdot \lambda_{LM}}{l_q}\right) \cdot \mu_o \cdot \left(\frac{i_{LM} \cdot \lambda_{LM}}{l_q}\right)\right] \cdot \left(\frac{\mu_o \cdot i_{LM} \cdot \lambda_{LM}}{4 \cdot \pi \cdot r_x}\right) \tag{7}$$

The wavelengths and currents are derived from setting the electrogravitational equation equal in absolute magnitude to Newton's gravitational equation at the same distance and solving for (f) in equation 6 that yields the same magnitude of force. This yields a frequency constant equal to 10.03224805 Hz. I call this the least quantum electrogravitational frequency and it is actually not an electromagnetic radiation but more of an energy loss per interaction. Further, The total electrogravitational action is summarized as: Non-loacal action ===>Local reaction and the total result is gravitational action. The non-local action is instantaneous and via energy space while the local reaction is relativistic and observable in our normal or real space. Then the delta frequency (f) is plugged into Heisenberg's delta momentum times delta wavelength = h and delta energy times delta time = h equations to derive a delta wavelength. Current is derived from charge of the electron per unit time related to 1/f. The parameters lq and rx are the classic radius of the electron and the distance through normal space between the matter being acted on respectively.

It is also possible to derive a quantum inductance and capacitance related to (f) in equation 6 and then a reactance associated with those parameters can also be derived. Taking the ratio of the capacitance and inductive reactances to the quantum Hall ohm yields a ratio that can be related to a cotangent function. The equation that expresses the entire two-system interaction is shown below in equation 8.

System 1 | System 2

$$FG := \left[\frac{\cot(\phi')\cdot\cot(\phi'')\cdot X_L \cdot e^{j\cdot\left(\frac{\pi}{2}\right)}\cdot\left(i_{LM}\right)^2}{\omega_{LM}\cdot r_x}\cdot A\cdot B\right]\cdot\mu_o\cdot\left[\frac{\cot(\phi')\cdot\cot(\phi'')\cdot X_L \cdot e^{j\cdot\left(\frac{\pi}{2}\right)}\cdot\left(i_{LM}\right)^2}{\omega_{LM}\cdot r_x}\cdot A\cdot B\right] \tag{8}$$

The left and right sides of the equation on the right of the equals sign are identical and thus express the symmetrical exchange of energy between systems. The phi expressions are phase angles derived from the ratio of reactances to the quantum hall ohm. The omega expression is the quantum electrogravitational frequency constant times two pi. For this discussion, A and B are equal to 1. The above equation yields a negative force since it has the square root of -1 (squared) in its mechanics. If we allow for one of the phase (phi) terms in one of the systems to swing through 180 degrees, we see that the force moves from positive to negative. Further, it is seen that it could be zero or approach infinity. Force and energy are effectively interchangeable since force times a distance is work that represents energy expended. Thus, figure 1 also represents induced energy from energy space.

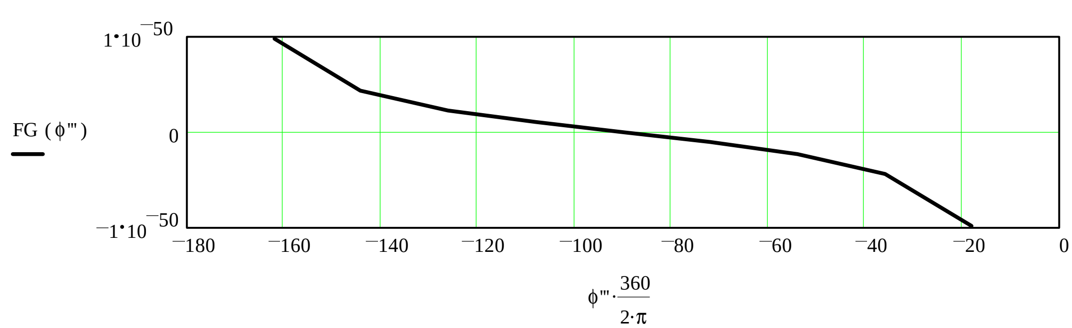

FIGURE 1. Force Output of Equation 8 Above and Related Phase Offset Between Quantum and Electric Standing Waves.

It has long been my contention that quantum particles such as the electron are standing waves of energy such that only a very small part of the energy is broadened per unit time. The energy difference per unit time is replaced by energy from energy space. The difference is what drives the gravitational force. If we examine the equations for an electrical standing wave and for a particle wave, we see that the form of both are very similar.

The electric voltage and currents along the line with respect to time are given by the following standard equations 9 and 10 below, which derive the result of the forward and reverse propagating waves (Nasar, 1987).

$$V\left(z_{vec}\right) := V_{plusvec} \cdot e^{-j \cdot \left(\frac{\omega}{u}\right) \cdot z} + V_{negvec} \cdot e^{j \cdot \left(\frac{\omega}{u}\right) \cdot z} \tag{9}$$

$$I\left(z_{vec}\right) := \frac{V_{plusvec}}{R_c} \cdot e^{-j \cdot \left(\frac{\omega}{u}\right) \cdot z} - \frac{V_{negvec}}{R_c} \cdot e^{j \cdot \left(\frac{\omega}{u}\right) \cdot z} \tag{10}$$

Note that z = any point on the line and the Vplusvec and Vnegvec terms are generally complex numbers as:

$$V_{plusvec} := V_{mplus} \cdot e^{j \cdot \theta} \quad \text{and} \quad V_{negvec} := V_{mneg} \cdot e^{-j \cdot \theta} \tag{11}$$

The following quotes apply directly to the concept of particle standing waves and also linear motion. This will be seen as very similar to the case for a transmission line as presented above. The following is a quote from (Atkins 1991a) at the end of this paper. Note: Figures C13a and C13b are not included in the below quotes. The figures locations are referenced at the end of this paper. Begin quote:

"A spatial wavefunction is complex if the particle it describes has a net motion; a spatial wavefunction is real if the particle has no net motion. For example, the spatial wavefunction (the only component we consider from here on) for a particle with linear momentum $kh/2\pi$ is:

$$\psi := e^{i \cdot k \cdot x} \quad \text{which} \quad = \cos(k \cdot x) + i \cdot \sin(k \cdot x) \tag{12}$$

The wavefunction is complex, and the particle has a net momentum (to the right, increasing x). The real and imaginary components of ψ are drawn in figure C. 13a, (Atkins 1991b) and we see that the imaginary component precedes the real component in phase (that is, the imaginary component is shifted in the direction of the particle's motion). The wavefunction of a particle traveling with the same momentum in the opposite direction is:

$$\psi := e^{-i \cdot k \cdot x} \quad \text{which} \quad = \cos(k \cdot x) - i \cdot \sin(k \cdot x) \tag{13}$$

Now the imaginary component is shifted to the left of the real component (Fig. C13b), (Atkins 1991b) and so once again its relative location marks the direction of travel. The wavefunction ψ = cos kx is real and corresponds to a standing wave with no net motion in either direction. It can be expressed as a superposition of the wavefunctions for motion to the left and right, because,

$$\psi := \cos(k \cdot x) \quad \text{which} \quad \psi := \cos(k \cdot x) \tag{14}$$

and the imaginary, direction-indicating component of the wavefunction has been canceled." End of quote. It is my suggestion that it is the phase between the quantum and electrical standing waves that control the energy input to an electron. It is the sudden energy transition that determines the distance of offset for the quantum jump. It is all about energy. In energy space, energy is not time-dependant whereas in our real space, energy is time-dependant.

The similarities of the above equations involving quantum particles to the equations involving electric standing waves of a transmission line are quite apparent. Then, it is suggested that since the quantum and macro-electronic equations are so similar, it may be possible to cause movement of a macro-quantum craft simply by altering the *phase* or *wavefunction* of a quantum standing wave to its associated electrical standing wave. It is also suggested that quantum space is very similar to transmission line geometry as far as how the particles move through space. Then, if you can see it, it is real and has a standing wave that is real. If it cannot be seen from our normal space, it is in imaginary space.

Atkins (1991b) is quoted below to further illuminate the nature of the wavefunction and its action on particle motion: Begin quote:

"All wavefunctions of definite and non zero energy are complex if we allow for their time dependence, since a time dependent wavefunction is the product of a spatial wavefunction ψ and a factor $e^{-iEt / 2\pi h}$. The rate at which a time dependent wavefunction changes from real to imaginary is therefore determined by its energy: The higher the energy the faster the wavefunction oscillates between purely real and purely imaginary. In this sense (and perhaps all the other rich, familiar attributes of energy are consequences of this sense), 'energy' is the rate of modulation of a wavefunction from real to imaginary." End of quote.

Atkins (1991c) is further quoted as: "a purely real (or purely imaginary) time-independant wavefunction represents a system with no net motion." End of quote.

To summarize the standing wave discussion above, it is established that the mass related to the electron, (and possibly all other particles), is the result of quantum matter and electrical standing waves. Based on this analysis, it is predicted that a large-scale system may also be constructed which will mimic the electron in a quantum sense, that is, tunnel through ordinary space to pop out somewhere else instantaneously. Instead of relying on an external electromagnetic energy to cause the quantum jump, the necessary change in electromagnetic energy is generated along with the acoustic (and thus quantum) standing wave and the amount of instantaneous phase change between the two standing waves determines the degree of jump through energy space to some point distant in normal space.

The energy required to do this 'jump' is not contained in the particle or structure, but simply gated in from energy space by controlling the particle or systems wave-function in a suitable fashion as described above. We may say that in order that the standing wave that makes up the particle be conserved, the energy is gated in to move the particle to a new point in space which in effect will conserve the standing wave and thus the integrity of the particle itself. This also suggests a method of tapping into energy space using a system of coherently managed particles where a single wavefunction would control them all and the energy imparted to the particles in unison from energy space would be converted by a suitable energy exchange device for use on an ordinary electric power grid. The direction of the jump is determined by forcing asymmetry in the field around the craft and then the jump will be related to the direction of field distortion.

CONCLUSION

It is postulated that there exists an energy, apart from normal space, that may be tapped by the electron structure to allow it to transfer instantly through jump space. It is therefore possible that a macro particle (or vehicle) using the same standing wave field mechanics as used by the electron can achieve the same results. Further, the direct transformation of energy from energy space to our normal space is also shown as a possibility in the preceding equations. The ability to travel to the stars in a very short time is now possible according to the equation results. (After seeing my equation, one fellow put it this way, " you could leave the solar system on a flashlight battery!"). Considering what the payoff would be if the above analysis is correct, someone should be willing to put the idea presented above to an immediate test. Finally, Man achieved flight by imitating the mechanics connected with the flight of birds. We can do the same concerning interstellar flight, by learning about and then duplicating electron mechanics on a larger scale. This could be a technology available for the betterment of all humanity and it could be realized sooner than many might believe possible.

NOMENCLATURE

Relevant equation terms are listed below as well as the established S.I. unit values. The fourteenth through the twentieth quantum constants are derived within my new theory (Bayles 1998).

Equation 1	S = phase of a liner part of a wave $(kg \cdot m^2 \cdot sec^{-1})$
Equation 1	R = Amplitude (joule)
Equation 2	m = particle mass (kg)
Gravitational constant	$G = 6.672590000 \times 10^{-11}$ $(N \cdot m^2 \cdot kg^{-2})$
Electron rest mass	$me = 9.109389700 \times 10^{-31}$ (kg)
Quantum Hall Ohm	$RQ = 2.58128056010 \times 10^{04}$ (ohm)
Classic electron radius	$lq = 2.81794092010 \times 10^{-15}$ (m)
Electrical permittivity of free space	$\varepsilon o = 8.85418781710 \times 10^{-12}$ $(farad \cdot m^{-1})$
Magnetic permeability of free space	$\mu o = 1.256637066110 \times 10^{-06}$ $(henry \cdot m^{-1})$
Bohr n1 radius	$rn1 = 5.29177249010 \times 10^{-11}$ (m)
Velocity of light in free space	$c = 2.99792458010 \times 10^{08}$ $(m \cdot sec^{-1})$
Variable rx preset to Bohr n1 orbital radius	rx = rn1
Basic electron charge	$qo = 1.60217733010 \times 10^{-19}$ (coul)
Quantum Electrogravitational Inductance	$LQ = 2.57298321582 \times 10^{03}$ (henry)
Quantum Electrogravitational Capacitance	$CQ = 3.86159328077 \times 10^{-06}$ (farad)
Quantum Electrogravitational Radius	$rLM = 1.35520361110 \times 10^{-03}$ (m)
Quantum Electrogravitational Frequency	$fLM = 1.003224805 \times 10^{01}$ (Hz)
Quantum Electrogravitational Time	$tLM = fLM^{-1}$
Quantum Electrogravitational Velocity	$vLM = 8.54245461210 \times 10^{-02}$ $(m \cdot sec^{-1})$
Quantum Electrogravitational Current Unit	$iLM = qo \cdot tLM^{-1}$

ACKNOWLEDGMENTS

Courageous pioneers in quantum physics such as David Bohm and Nicolus Gisin have expanded the boundaries of accepted thinking to prove that non-local action is a reality. Non-local instantaneous correlated particle interaction that is independent of distance of separation in real space must be included in the overall framework of physics as a result. This has led me to formulate a new physics which combines non-local action to local reaction as a guiding principle to explain the mechanics of gravitation and thus arriving at a unified field theory.

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