the general science journal

THE CONTROL OF THE NATURAL FORCES

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ABSTRACT

An understanding of the natural world has progressed in the direction of higher energies. The stationary quantum state has emerged as a central theme within this quest. The stationary quantum states were used to explain the workings of nature. The emergence of the macroscopic multi-body cold fusion phenomena has allowed an understanding of the nature to progress in the direction of lower energies. This author's qualification of this low energy regime has revealed the transitional quantum state. The introduction of the transitional quantum state provided a causative explanation for the quantum condition. This paper will produce the energy of the photon, the energy levels of the hydrogen atom, and the probability of transition as effects of the transitional quantum state. An understanding of the path of the quantum transition may lead to the development of many new technologies.

INTRODUCTION

Joseph von Fraunhofer devised the first spectrometer, in the early 1800's. He discovered, with his device, spectral lines within the Sun's light. He used these lines as reference points in the design of achromatic lenses.[1] Robert Bunsen and Gustav Kirchhoff, in the mid 1800, discovered spectral lines in the light that emanated from the elements within the flame of their Bunsen burner.[2] Johann Balmer produced an empirical equation that described this spectrum in the late 1800's.[3] Johannes Rydberg extended Baumer's formulation to the spectra of all of the elements.[4] These discoveries allowed astronomers to determine the elemental composition of stellar objects. These early scientists could not, however, provide a causative explanation for the spectral emissions.

In the early 1900's Max Planck offered an explanation for these spectral emissions. He introduced the idea that thermal energy is bundled into tiny quantum units.[5] Albert Einstein used Planck's constant and showed that the energy of light is bundled into particle like photons.[6] The principle of quantum correspondence emerged with the appearance of the photon. It states that the square of the amplitude of a classical light wave directly corresponds, in some limiting way, to the frequency of a photon. Niels Bohr applied Planck's construct to the atomic structure of the atom. Bohr's quantized atom explained the emission spectrum of the atoms and the chemical properties of the elements.[7] According to classical electromagnetic theory of James Clerk Maxwell orbiting electrons should continuously emit electromagnetic energy.[8] Atoms electrons emit packets of energy at random intervals. Bohr's model could not explain the stability of the stationary atomic states, produce the probability of transition, or explain why the frequency of the emitted photon is not coupled to the frequency of a stationary quantum state. Lewis deBroglie offered, what has now become, the contemporary solution to this problem. He proposed that the electron has wave like properties.[9] The electron does not accelerate around the nucleus, but rather, it encircles it in the form of a standing wave. A particle like photon is emitted as these standing waves instantaneously collapse. The emitted photon exists as both a wave and a particle. These properties are mutually exclusive and their simultaneous emergence is a paradox. In an attempt to reconcile some of these difficulties Bohr introduced the principle of complementarily. It states that the frequency of a quantum wave exists, in some mysterious way, as a complement to its particle of energy. This solution attempted to describe the quantum condition and, in the process, introduced many intractable problems. The deBrogle wave is a curious mathematical formulation that shrinks and swells with velocity. It has no classical analog. No explanation was provided as to why the undulating deBroglie waves do not continuously leak energy through a process of radiation. The problem of the stability of the atom was, in effect, transferred from the stationary quantum state to the deBroblie wave. Max Born's Copenhagen

interpretation attempted to get around these difficulties and stated that matter's deBroglie wave is not real. [10] Born's matter wave is a subjective construct of probability that exists only within a mathematical configuration space. Albert Einstein rejected the subjective nature of this construct and believed, until his death, that the theory of quantum mechanics was not complete.[11]

In the late 20th Century Frank Znidarsic observed a velocity within some cold fusion and gravitomagnetic experiments. He discovered that velocity is that of sound within the nucleus. He produced a classical model of quantum reality that includes both the atomic spectra and this new observable. He discovered that the quantum condition is the result of a classical impedance match that occurs when the velocity of light within the electronic structure of the atom equals the velocity of sound within its nuclear structure. Momentum is carried by the magnetic components of the force fields. Magnetism is not a conserved property. This model suggests that the magnitude of the magnetic, gravitomagnetic, and nuclear spin orbit forces converge during the quantum transition.

THE OBSERVABLES

Thermal energy, nuclear transmutations, and a few high energy particles have reportedly been produced during cold fusion experiments. The transmutation of heavy elements has also been reported.[12,13,14] The name Low Energy Nuclear Reactions is now used to describe the process. The process was renamed to include the reported transmutation of heavy elements. According to contemporary theory heavy element transmutations can only progress at energies in the millions of electron volts. The available energy at room temperature is only a fraction of an electron volt. These experimental results do not fit within the confine of the contemporary theoretical constructs. They have been widely criticized on this basis. These experiments have produced very little, if no, radiation. The lack of high energy radiation is also a source of contention. Nuclear reactions can proceed, smoothly through the coulombic potential barrier, under a condition where the range of the nuclear spin orbit force is extended. The process of cold fusion may require a radical restructuring of the range and strength of the magnetic component of the strong nuclear force (the spin orbit force). The condition of the active nuclear environment provides some clues. Low Energy Nuclear reactions proceed in a domain of 50 nanometers.[15,] They have a positive thermal coefficient.[16] The product of the domain size and the thermal frequency is approximately one million meters per second. Equation #1 is an empirical formulation that expresses this observation. It produces the transitional velocity (1,094,000 m/s) as the product of the angular frequency and the size of the active domain. The angular frequency is a fraction n of the electron's Compton frequency. The displacement is a multiple n of the electromagnetic radius of the proton. The result V_t is the speed of a longitudinal sound wave, across atomic distances, within the dissolved deuterium.

(1)

$$V_t = (2\pi f_c / n)(n r_p)$$

The gravitational experiments of Eugene Podkletnov involved the 3 megahertz stimulation of a 1/3 of a meter superconducting disk. These experiments reportedly produced a strong gravitational anomaly.[17, 18, 19,20] The results also do not appear to fit within the contemporary scientific construct. They have been widely criticized. It is assumed that the generation of a strong local gravitational field violates the principle of the conservation of energy. The strength of the electrical field can be modified with the use of a dielectric. The existence of a gravitational "di-force-field" no more violates the principle of the conservation of energy than does the existence of an electrical dielectric. The geometry of the superconducting structure provides collaborating information. The product of the disk size and the stimulation frequency expresses, as in the case with cold fusion, a velocity of one meter million meters per second. This velocity V_t may be associated with optical phonons within the superconductive structure. [21]
The process of gravity modification may require a radical increase in the strength of the magnetic component of the gravitational field (the gravitomagnetic force).

THE VELOCITY OF SOUND WITHIN THE NUCLEUS

The energy produced by two interacting charges is expressed by Coulomb's Equation (2).

(2)

$$E = \frac{Q^2}{4\pi e_o}(1/r_x)$$

In order to analyze V_t this author regrouped the constants in Coulomb's formulation, equation (2), into the form a spring, equation (3). The reformulation reveals a wavelike elastic constant and a particle like elastic discontinuity. It expresses the energy of a force field that diminishes with the square of its displacement. It suggests that the electrical force is produced as a particle like discontinuity r_p disrupts the field of another electron. The force produced by the disruption is similar to the upward force produced by a bubble in water. The displacement r_p may be a classical effect that is associated with the compressive elastic limit of the electron (http://www.wbabin.net/science/znidarsic2.pdf). The classical radius of the electron $2r_p$ is a multiple of this point.

(3)

$$E = K_{-e} r_p^{\,2}$$

The variable, classical elastic constant of the electron K_{-e} emerged from this redistribution. It is expressed in equation (4). The elastic constant of the electric field resembles that of a gum band in that it decreases with displacement. The electron's wave like properties emerge as affects of its elastic constant K_{-e}.

(4)

$$K_{-e} = \frac{F_{\max}}{r_x}$$

The elastic constant of the electron field equals the elastic constant of the strong nuclear force at points where the expansive electromagnetic force balances the compressive strong nuclear force. Under this condition the electrical elastic constant K_{-e} may be employed to produce the harmonic motion of a nucleon. The electrical force is expelled from the nucleus, does not act between nucleons, and was factored into the calculation. The frequency of a nuclear mechanical wave, at small displacements, was produced in equation (5).

(5)

$$f_t = 1/2\pi\sqrt{\frac{K_{-e}}{M_n}}$$

The elastic constant of the electron was inserted into equation (5) producing equation (6). V_t emerged as a product of the harmonic motion of the nucleons at a displacement equal to twice the Fermi spacing, r_n, of

the nucleons. [22] The Fermi spacing (momentum spacing) is a little longer than the radius of a proton as a result of the movement of adjacent nucleons.

(6)

$$V_t = 1/2\pi\sqrt{\frac{(F_{\max}/2r_n)}{M_n}}2r_n$$

The result V_t is the speed of sound within the nucleus. This speed is also exhibited across atomic distances within the active regions of cold fusion experiments (Ref. Equation #1). The quantum condition is established through the action of V_t .

THE ENERGY OF THE PHOTON

Max Planck introduced the quantum and, with it, offered a solution to the problem of spectral emission. As a conventional physicist Planck struggled to find a classical solution. Over one hundred years later the emergence of new observables has enabled Frank Znidarsic to propose one. The quantization of energy emerges as a classical affect of a condition where the velocity of light within the electronic structure of the atom equals the velocity of sound within its nuclear structure. The equalization of velocities aligns the impedance of the interacting states. This impedance match allows energy to be exchanged, without bounce, and the quantum transition to progress. The velocity of quantum transition was expressed as the product of frequency and wavelength in equation (7).

(7)

$$V_t = f_t\lambda_t$$

The frequency of the emitted photon is not that of any stationary atomic state. It does, however, equal the frequency of the transitional atomic state f_t. The energy of a photon emerges as an effect of the interaction of the transitional geometry λ_t and an electrical charge. The simultaneous emergence of both the photon's frequency and energy is fundamental to Bohr's principle of complementarily. In combination, these affects reconcile the duality of nature.

Capacitance is a function of geometry. A flat plate capacitor was used, in this analysis, to qualify the geometry of the transitional photon. The capacitance C of a flat plate capacitor of area A and spacing d is given in Equation (8).

(8)

$$C = \frac{e_o A}{d}$$

The area swept out by a light wave was set equal to its wavelength squared and the distance d between the wave's amplitudes was also set to one wavelength. The capacitance experienced by such a cycle of light is given in equation (9).

(9)

$$C = \frac{e_o \lambda_t^{\,2}}{\lambda_t}$$

The photon has two degrees of freedom that are at right angles to each other. The geometry resembles that of an open ended box. Equation (9) was multiplied by a factor of two and reduced resulting in equation (10). Equation (10) expresses the geometry of the transitional photon in terms of its electrical capacitance. The geometry of the transitional photon was expressed in terms of its capacitance C in order to include other effective geometric configurations.

10)

$$C = 2e_o \lambda_t$$

Equation (7) was solved for wavelength producing equation (11).

(11)

$$\lambda_t = V_t / f_t$$

Equation #11 was inserted into equation (10) producing equation (12). Equation (12) expresses the capacitance of the transitional photon in terms of its frequency. The introduction of equation (11) sets the velocity of sound in the nucleus equal to the velocity of light within the electronic structure of the atom.

(12)

$$C = \frac{2e_o V_t}{f_t}$$

The energy of an electrical charge is was expressed in terms of its capacitance in equation (13).

(13)

$$E = \frac{Q^2}{2C}$$

The energy of light wave is a function its geometry. This energy was qualified through the simultaneous solution of equations (12) and (13). The result (equation #14) describes the energy of a photon. Equations (12) and (13) reveal that this energy varies inversely with capacitance. The voltage produced by an electrical charge increases as its capacitance decreases. The energy of a photon is proportionate to the amplitude of this voltage. The energy of a photon and a classical wave are both functions amplitude. The relationship between the photon's energy and frequency, that was described by Planck, is dependent upon this voltage. The action of the amplitude of this voltage is fundamental to the principle of quantum correspondence.

(14)

$$E = [\frac{Q^2}{4e_o V_t}] f_t$$

The terms within the brackets [ ] equal Planck's constant. Planck's constant was substituted for the quantity within the brackets. Einstein's famous photoelectric relationship was produced.

(15)

$$E = hf_t$$

The energy of a photon is a classical function of its amplitude. This amplitude was expressed in volts. The photon interacts with matter at points were the velocity of sound within the nucleus equals the velocity of light within the electronic environment. The photon exhibits particle like properties at these points. The action of light, at other points, is that of a wave. The frequency of the emitted photon is not that of any stationary quantum state, it is that of the transitional quantum state.

The Energy Levels of the Hydrogen Atom

Maxwell's theory predicts that accelerating electrons will continuously emit electromagnetic radiation. Bound electrons experience a constant centripetal acceleration; however, they do not continuously emit energy. Atom's emit bursts of energy at random intervals. The transient nature of these emissions cannot be accounted for by any existing classical theory. This author proposes that the stability of the atom is established through the pinning action of discontinuity r_p. Energy can break away from the grip of the discontinuity by flowing through a channel of matching impedance. Points, of matching impedance, were qualified by setting the velocity of sound in the nuclear environment equal to a harmonic of the angular velocity of light around the discontinuity (ref. equation #16). The result is an expression of the electron's spin.

(16)

$$V_t = n\omega_{-e} r_p$$

The frequencies of the transient electron were expressed as a harmonic multiples n of a fundamental frequency. The transitional velocity was expressed, in equation (17), in terms of the product of these frequencies and displacement r_p. The characteristic impedance of the interacting systems is aligned at a velocity described by these frequencies and harmonics

(17)

$$V_t = n\sqrt{\frac{K_{-e}}{M_{-e}}}r_p$$

The variable elastic constant of the electron, as given in equation (4), was inserted equation (17) producing equation (18).

(18)

$$V_t = n\sqrt{\frac{(F_{\max}/r_x)}{M_{-e}}}r_p$$

Equation (18) was solved for r_x resulting in equation (19).

(19)

$$r_x = n^2[\frac{F_{\max}r_p^{\ 2}}{V_t^2 M_{-e}}]$$

The quantity within the brackets [ ] equals the ground state radius of the hydrogen atom. The reduction of the terms within the brackets produced equation (20).

(20)

$$r_x = n^2 r_{+h}$$

The result r_x equals the principle radii of the hydrogen atom. The principle energy levels of the hydrogen atom were produced as a condition in which the velocity of a mechanical wave within the nucleus equals the velocity of an electromagnetic wave.

The model can be extended to all of the elements by allowing fractional values of frequency and applying a factor of Z to the elastic constant (ref equation 19B). The model produces the energy levels of the muonic atom when the reduced mass of the muon is placed into the equation. (ref Equation 19B)

(19B)

$$V_t = (n/Z)\sqrt{\frac{(ZF_{\max}/r_x)}{M_{-e}}}r_p$$

The stationary energy levels of the atoms exist as points of electromagnetic and gravitomagnetic discontinuity. The electron transits between these levels at points of electromagnetic and gravitomagnetic continuity.

The principle atomic states exist at points where the velocity of light within the electronic structure of the atom equals the velocity of sound with its nuclear structure.

ABOUT CHARACTERISTIC IMPEDANCE

The velocity V_t is inversely proportional to the inductance and capacitance of the system.

(21)

$$V_t \alpha \frac{1}{\sqrt{LC}}$$

This author has also described the energy levels of the atoms in terms of an impedance match. Electrical characteristic impedance Ω also a function of the capacitance and inductance of the system.

(22)

$$\Omega = \sqrt{L/C}$$

A change in the dielectric of a material equally effects the characteristic impedance and the velocity of light. The electrical properties of materials tend to vary and the magnetic properties remain mostly constant. The principle quantum number are affects of a change in the electrical constant. These states exist as points of matching speed. The principle spectral lines split into several fine lines under the influence of a magnetic field. Arnold Sommerfeld qualified these fine lines through the introduction of a second quantum number.[23] Equations (21) and (22) diverge under a condition were the magnetic permeability of the material is varied. States of matching impedance are no longer associated with states of matching velocities. The fine structure of the atom emerges under this condition. The difference between the length of the longer fine and the length of the shorter fine line divided by the length of the longer line yields the fine structure constant. The origin of this constant has been a mystery. Richard Feynman stated, "Physicists put this number up on their wall and worry about it." This author has classically produced the fine structure constant as the ratio of twice the transitional velocity to the velocity of light.[24]

(23)

$$\alpha = 2V_t / c$$

The Intensity of Spectral Emission

Bohr's semi-classical atomic model could not account for the intensity of the spectral lines. Werner Heisenberg arranged the properties of the electron on a matrix. Planck's empirical constant was inserted ad-hoc into the formulation as a commutative property of matrix multiplication. Heisenberg's solution produced the intensity of the spectral emission. The particle like solution established the field of quantum physics, however, it did not provide visual image of the process. Lewis deBroglie proposed that matter is a wave. Erwin Schrödinger incorporated deBroglie's electron waves into a solution that also produced the intensity of spectral emission. The introduction of the deBroglie wave produced a cleaner solution but, in the process, it introduced a conceptual problem. How do the discrete properties of matter emerge from a

continuous wave? Schrödinger proposed that the superposition of an infinite number of waves localized the wave function. Wave patterns repeat at intervals. The solution suggests that the particle appears at intervals in remote locations. Matter's particle nature did not spontaneously emerge from the analysis and Planck's empirical constant had to be, once again, injected ad-hoc into the solution.

A particle emerges, from the probability wave, upon the immediate collapse of the wavefunction. The solution attempted to extract a particle out of a wave and to solve the problem of wave particle duality. The interpretation did not provide for a mechanism to bind the electron to a state, disclose the whereabouts of configuration space, or explain how a wavefunction collapses at superluminal velocities

The great scientists knew nothing of the path of the quantum transition.[25] Their solutions did not incorporate the probability of transition. Znidarsic claims to have discovered the path of the quantum transition. His construct is centered upon the probability of transition. The amplitude (displacement) of vibration at the dimensional frequency of V_t squared is proportionate to the probability of transition.

The transitional electronic state may be described in terms of its circumferential velocity. Equation (24) describes the spin of the transitional quantum state.

$$V_t = n\omega_{-e} r_t \tag{24}$$

As before, harmonics n of the angular frequency of the transitional electron were determined using the electron's elastic constant and mass (ref. equation #25).

$$n\omega_{-e} r_t = n\sqrt{\frac{K_{-e}}{M_{-e}}} r_p \tag{25}$$

Equation #25 was squared resulting in equation (26). Equation (26) expresses the angular velocity of the transitional quantum state squared.

$$(n\omega_{-e} r_t)(n\omega_{-e} r_t) = n^2 \frac{K_{-e}}{M_{-e}} {r_p}^2 \tag{26}$$

The transitional velocity given in (24) was factored into equation (26) producing equation (27). This factor restricts the velocity of the system to that of sound within the nucleus.

(27)

$$(n\omega_{-e}r_t)(V_t) = n^2 \frac{K_{-e}}{M_{-e}} r_p^{\,2}$$

The elastic constant of the electron was set, in equation (28), to the radius of the transitional electronic state.

(28)

$$K_{-e} = \frac{F_{\max}}{r_t}$$

The elastic constant of the electron (28) was placed into equation (27) resulting in equation (29).

(29)

$$(n\omega_{-e}r_t)(V_t) = n^2 \frac{F_{\max}}{r_t M_{-e}} r_p^{\,2}$$

Equation (29) was solved for the radius of the transitional quantum state (30).

(30)

$$r_t^{\,2} = \frac{F_{\max} n r_p^{\,2}}{2\pi f_{-e} V_t M_{-e}}$$

The constants in equation (30) were regrouped and the numerator and denominator were multiplied by a factor of 4π resulting in equation (31).

(31)

$$r_t^{\,2} = [\frac{4\pi F_{\max} r_p^{\,2}}{V_t}](\frac{n}{8\pi^2 M_{-e} f_{-e}})$$

The factors within the [ ] equal Planck's constant. The reduction of the terms within the brackets produced, Equation (32), the known formulation for the amplitude of electronic harmonic motion squared.

(32)

$$r_t^{\,2} = \frac{nh}{8\pi^2 M_{-e} f_{-e}}$$

This formulation expresses the intensity of the light emitted by the harmonic motion of an electron. The intensity of this emission is a function of the probability of transition. The probability of transition is proportionate to the amplitude of the transitional quantum state squared. The solution requires no probability waves, special configuration spaces, or paradoxical quantum principles.[26]

A CONVERGENCE OF THE MOTION CONSTANTS

It has been shown that the quantum condition arises through the action of an impedance match. This match strongly couples electromagnetic and mechanical waves. This result suggests that the forces that mediate the mechanical and electrical waves also converge. This author suggests that impedance matching property of the transitional quantum state extends to the dynamic component of each of the natural forces. These components are not a conserved and can be amplified under certain conditions. The dynamic magnetic component of the natural forces interact strongly and at range during the quantum transition. This strong interaction permits the quantum transition to proceed uniformity and without bounce. This author's theorem, "The constants of the motion tend toward the electromagnetic in a Bose condensate that is stimulated at a dimensional frequency of 1.094 megahertz-meters" describes this strong gravitomagnetic and electromagnetic interaction. The experimental results of cold fusion experiments also support the idea that the natural force interact strongly. These reactions proceed without producing a commensurate amount radiation. No radiation will be emitted after the range of the strong nuclear spin orbit force has extended to that of the electromagnetic. The process of quantum transition also supports the idea of a convergence in the motion constants occurs. This process changes the state of a particle. The frequency of an emitted photon, for example, is not that of any stationary quantum state. The frequency of the emitted photon is an effect of the action of the transitional quantum state. The reconfiguration of a state is facilitated through the strong interaction of natural forces. The collapse of the wavefunction and the non-local nature of the quantum realm also support the idea of a convergence in the motion constants occurs. The convergence of the motion constants, within the transitional quantum state, increases the system's negative gravitational potential to the point where it equals its positive energy. The composite zero energy wavefunction is able to immediately collapse. The flow of the mathematics within this paper also support the idea of a convergence in the motion constants occurs. The radius r_p rests at the point where the strength of a proton's electrical field equals the strength of its strong nuclear field. This equalization, in the strength of the two fields, energetically couples electromagnetic force to the strong nuclear force. The radius r_p is at a point where the electrical force between two electrons (29.05 Newtons) is of the magnitude to induce the gravitational field of the electron. This affect establishes the transitional atomic state as a point electromagnetic, gravitomagnetic, and nuclear continuity.

The Classical deBroglie Wave

Equation (1) was solved for frequency in equation (33). The result is the Compton frequency of the electron. The frequency and displacement are expressions of the spin of the system.

(33)

$$f_c = \frac{V_t}{2\pi r_p}$$

The electron undulates, at the Compton frequency, in simple harmonic motion. This motion is a function of the elastic constant of the electron at a displacement equal to the ground state radius of the hydrogen atom (34).

(34)

$$f_c = 1/2\pi\sqrt{K_{-e}/M_{-e}}$$

Current models offer no explanation as to why the undulating electronic waves do not continuously radiate energy. This issue was brushed aside in the Copenhagen Interpretation of quantum physics. Classical systems are constructed by fastening components together. Fasteners are mechanical discontinuities. The same binding mechanism can attach a field. The electromagnetic field is, for example, pinned into the structure of a superconductor by introduced defects (discontinuities). This author has suggested that mass and kinetic energy are pinned into the structure of matter at elastic discontinuities. This energy is shaken free of this discontinuity through the action of a vibration at the dimensional frequency of V_t. A particle like elastic discontinuity r_p appears in equations (3) and (17). The discontinuity acts as a pilot and prevents the continuous emission of the wave. The use of a single binding mechanism, in both classical and quantum systems, is a simplification. This simplification is in accordance with principle of Occam's razor. The phase speed of disturbances within the pinned fields is luminal. The group speed V of the packet is that of the discontinuity. The condition resembles that of a stiff imaginary bell. Sound within such a bell would propagate at the phase speed c. The entire bell would swing at the group speed V. DeBroglie suggested that the matter wave naturally emerges, from the superposition of the Compton wave and its Doppler shifted refection, under this condition. Classical Doppler shift is given in equation (35).

(35)

$$f_2 = f_1(1+-v/c)$$

The amplitude of a Compton wave, as given in equation (36), is the superposition of the wave and its Doppler shifted reflection. The phases of the waves, at time zero, were set 90 degrees out of phase by the addition of π. The amplitude of this wave at time zero is zero. This is the condition at the surface of matter.

(36)

$$f(t) = \sin(2\pi f_c\, t + \pi) + \sin(2\pi f_c(1 \pm v/c)t)$$

A maxima in the wave was produced by setting the phases, σ, of the waves equal. This is the condition at the center of the wave.

(37)

$$\sigma_1 = \sigma_2$$

(38)

$$2\pi f_c\, t + \pi = 2\pi f_c t\ (1 \pm v/c)$$

Replacing the Compton frequency with its contemporary value of the Compton frequency resulted in equation (39).

(39)

$$2\pi(Mc^2/h)t + \pi = 2\pi(Mc^2/h)t\ (1 \pm v/c)$$

The reduction of equation (39) yields equation (40).

(40)

$$ct = \pm\frac{h}{2Mv}$$

This author's interpretation states that the phase speed of the matter wave is luminal. This luminal displacement ct was replaced, under this interpretation, with the wavelength of the deBroglie wave. The result, equation (41), is the deBroglie wave of matter.

(41)

$$\lambda_d = \frac{h}{Mv}$$

Schrödinger incorporated Planck's constant and deBroglie's waves within his wave equation. Schrödinger's wave equation is currently held to be an irreducible tenement of nature. It describes most of physics and all of chemistry. This author has produced Planck's constant and the deBroglie wave from a fundamental classical argument. This emergence has provided a classical foundation for the Schrödinger wave equation.[26] No special configurational spaces were required.

This line of reasoning was extended to produce a unification of quantum physics and Special Relativity refer to (http://www.wbabin.net/science/znidarsic.pdf).

NEW TECHNOLOGIES

This analysis suggests that a macroscopic body may be forced into a state of quantum transition. Trillions of atoms may be adjoined within a single transitional state through a process involving the external vibration of a Bose condensate. Strong gravitational and long range nuclear forces may be induced. The use of these strong, long range forces could provide new sources of propulsion, allow for the reduction of nuclear waste, and lead to the development of new sources of energy.

CONCLUSION

The field of quantum physics was revolves around the stationary quantum state. New observables have emerged from experiments involving low energy nuclear reactions. This author, with the use of these observables, has developed results as a condition of the transitional quantum state. These results provide a causative classical explanation for the quantum condition and may lead to the development of revolutionary new technologies.

NOMENCLATURE

F_c = 1.236×10^{20} hertz, the Compton frequency of the electron
F_{max} = 29.05 Newtons, the electron's force maximum
K_{-e} = $29.05/r_x$ Newtons/meter, the elastic constant of the electron
M_{-e} = 9.109×10^{-31} kg, the mass of the electron
M_n = 1.67×10^{-27} kg, the mass of a nucleon
r_p = 1.409×10^{-15} meters, the radius of energetic accessibility
r_{+h} = $.529 \times 10^{-10}$ meters, the radius of the hydrogen atom
V_t = 1.094×10^{6} meters per second, the transitional velocity
r_n = 1.36×10^{-15} meters , the nuclear Fermi momentum spacing

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