The Control of the Natural Forces

Frank Znidarsic*

***Abstract** — The electrical force has a convenient range and strength. This convenient range and strength has made the electromagnetic force easy to exploit. The strong nuclear force has a range measured in Fermis. The strong nuclear force has not been harnessed with classical technology, as its range is too short. The gravitational force is very weak. This weakness has made it impossible to control the gravitational force. A dielectric medium affects the range and the strength of the electrical force. It is commonly believed that no (di-force-field) medium exists for the other forces. It is assumed that the range and strength of the nuclear and gravitational forces will converge at high energies. These energies are beyond the reach of any conceivable technology. A low energy condition may exist in which the range and the strength, of all the natural forces, are affected. This condition is that of the quantum transition. This paper presents arguments that may have exposed the path of the quantum transition. This exposure may lead to the development of technologies that convert matter into energy and technologies that provide propellant-less propulsion.*

INTRODUCTION

Max Planck's constant qualifies the angular momentum of the stationary atomic state.[1] The path of the transitional quantum state has been unknown. Albert Einstein described the energy of a photon with Planck's constant.[2] Niels Bohr applied these ideas to the atomic structure. Bohr's quantum condition states that the angular momentum carried by a stationary atomic orbit is a multiple of Planck's constant.[3] The quantization of angular momentum is a postulate, underivable from deeper law. Its validity depends on the agreement with experimental spectra. Werner Heisenberg and Erwin Schrödinger extended these ideas and qualified the intensity of a spectral emission. These great scientists found that the frequency and amplitude of the emitted photon is a function of the differential in energy through which the electron drops. The frequency and amplitude of a classical wave is that of the emitter. The correspondence principle was invented in an attempt to explain this discrepancy. It states that the frequency and amplitude of a classical system is equivalent to the energy drop within a quantum system. These constructs form the foundation of modern physics. The structure built upon this foundation considers the classical regime to be a subset of the quantum realm.

The Znidarsic constant V_t qualifies the velocity of the transitional quantum state. The transitional velocity is coupled with a frequency and a displacement. The energy levels of the atom are shown, in the body of this paper, to be a condition of the transitional frequency. The intensity of spectral emission is shown to be a function of the transitional amplitude. The action of the transitional quantum state replaces the principle of quantum correspondence. An extension of this work would universally swap Planck's and Znidarsic's constants. There would have to be a compelling reason to make this change, as it would confound the scientific community. There are two good reasons for doing so. Velocity is a classical parameter. The structure built upon this foundation considers the quantum regime to be a subset of the classical realm. Znidarsic's constant describes the progression of an energy flow. An understanding of this progression may lead to the development of many new technologies.

THE OBSERVABLES

Thermal energy, nuclear transmutations, and a few high energy particles have reportedly been produced during cold fusion experiments.[4,5] Transmutation of heavy elements has also been reported.[6] 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 without producing radiation under a condition where the range of the nuclear force is extended. The process of cold fusion may require a radical restructuring of the range of the natural forces. The condition of the active nuclear environment provides some clues. Low energy nuclear reactions proceed in a domain of 50 nanometers.[7-9] They have a positive thermal coefficient. The product of the thermal frequency and the domain size is 1 megahertz-meter. The units express a velocity of one million meters per second.

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.[10-13] 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.[14] The product of the disk size and the stimulation frequency expresses, as in the case with cold fusion, a velocity of one million meters per second. This velocity may be that of the quantum transition.

Electromagnetic energy flows strongly from the parent to the daughter states during transition. This flow of energy is mediated by a strong electromagnetic interaction. It is reasonable to assume that the other natural forces also interact strongly during transition. The flux of the force fields flows strongly, and at range, from the parent to the daughter state. The daughter is not just a displaced parent. The rearrangement of the force fields gives birth to an entirely new state. This process is associated with the emission of a photon. A convergence in the motion constants uncouples the frequency of the emitted photon from the frequency of the emitting electron. Znidarsic's constant, V_t, has been refined to a value of 1.094 megahertz-meters. Znidarsic's theorem ("The Constants of the Motion tend toward those of the electromagnetic in a Bose condensate that is stimulated at a dimensional frequency of 1.094 megahertz-meters.") qualifies the strong transitional interaction. All energy flows progress by way of a quantum transition. This theorem describes the process of quantum measurement.

THE GEOMETRY OF A QUANTUM EMITTER

Planck's constant describes the energy of an emitted photon. Znidarsic's constant describes the geometry of the emitting structure. Additional classical parameters are required in order to describe quantum phenomena in terms of the emitting structure. They will be briefly presented. The radius r_p is that of the maximum extent of the proton. The strength of the electrical force equals the strength of the strong nuclear force at this radius. The classical radius of the electron exists at $2r_p$. The coulombic force produced between two electrical charges compressed to within $2r_p$ equals 29.05 Newtons. The force produced by an amount of energy equal to the rest mass of the electron confined to within $2r_p$ is also 29.05 Newtons. This confinement force F_{max} was qualified in Equation (1).

$$F_{\max} = \frac{M_{-e}c^2}{2r_p} \qquad (1)$$

Einstein's General Theory of Relativity states that a force can induce a gravitational field. The gravitational field of the electron may be coupled to the outward force of its confined energy. Newton's formula of gravity was set equal to Einstein's formula of gravitational induction in Equation (2). The dependent variable in this relationship was the mass of the electron.

$$\frac{GM_{-e}}{(2r_p)^2} = \frac{G}{2r_p c^2} F_{\max} \qquad (2)$$

The strength of the natural forces converges at radius r_p. This convergence allows energy to flow between the natural force fields. The radius r_p is the classical radius of energetic accessibility.

The electrical field is usually described in terms of force and charge. This paper describes the electrical field in terms of an elastic displacement. The elastic displacement method exposes the geometric conditions that are experienced by quantum emitters. The elastic constant of the electron K_{-e} was derived from the classical radius of energetic accessibility. The force at this radius is F_{max}. It was assumed that elastic constant of the electron varies inversely with displacements that exist beyond r_p.

$$K_{-e} = \frac{F_{\max}}{r_x} \qquad (3)$$

The elastic energy of the electron is given in Equation (4).

$$E = \frac{1}{2} K_{-e} (2r_p)^2 \qquad (4)$$

The elastic constant was tested at two radii. Radius r_x was set equal to the classical radius of the electron $2r_p$. The elastic energy contained by an elastic discontinuity of displacement of $2r_p$ equals the rest energy of the electron. Radius r_x was then set equal to the radius of the hydrogen atom. The elastic energy contained by an elastic discontinuity of displacement of $2r_p$ equals the zero point kinetic energy of the ground state electron. This author has suggested that the natural force fields are pinned into the structure of matter at this discontinuity.[15] The transitional quantum state removes the discontinuity and releases the fields. This brief introduction describes the classical parameters associated with the emitting structures.

THE ENERGY LEVELS OF THE HYDROGEN ATOM

Maxwell's theory predicts that accelerating electrons will continuously emit electromagnetic radiation.[16] Bound electrons experience a constant centripetal acceleration; however, they do not continuously emit energy. An atom's electrons emit energy at discrete quantum intervals. The quantum nature of these emissions cannot be accounted for by any existing classical theory. Quantum theory assumes that the gravitational force is always weak and ignores it. This is a fundamental mistake. During transition, electromagnetic and gravitomagnetic flux quickly flows from the parent to the daughter state. This rapid flow progresses by way of a strong electromagnetic and strong gravitomagnetic interaction. The energy levels of the atom are established through the action of this strong interaction. The velocity of the centric transitional electronic state V_t was expressed as the product of its frequency f_t and wavelength.

$$f_t 2\pi\lambda = V_t \qquad (5)$$

Lengths of energetic accessibility exist at r_p. The velocity of the atomic transitional states are integer multiples of this fundamental length.

$$f_t 2\pi(nr_p) = V_t \qquad (6)$$

A solution, Equation (7), yields the frequency of the transitional quantum state f_t. For the isolated electron ($n = 1$) the frequency f_t equals the Compton frequency f_c of the electron.

$$f_t = \frac{V_t}{2\pi n r_p} \qquad (7)$$

The transitional quantum state is a Bose ensemble of stationary quantum states. The interaction of the fields within this ensemble resembles that of the electromagnetics within a superconductor. The infinite permeability of the ensemble confines the static fields. The zero permittivity of the ensemble expels the dynamic fields. These effects extend to the ends of the condensation. The motion constants vary directly with the extent of the condensate. The frequency of the ensemble is a function of its motion constants. For a Bose condensate ($n > 1$) the frequency f_t varies inversely with the radius of the condensate. These effects describe the di-force-field of the transitional quantum state.

The electron vibrates in simple harmonic motion. The natural frequency f_n of the electron is a function of its elastic K_{-e} constant and mass M_{-e}.

$$f_n = \frac{\sqrt{K_{-e} / M_{-e}}}{2\pi} \tag{8}$$

The mass and the elastic constant of the electron were used to formulate the electron's natural frequency.

$$f_n = \frac{\sqrt{(F_{\max} / r_x) / M_{-e}}}{2\pi} \tag{9}$$

The frequency of the transitional state f_t was set equal to the natural frequency of the electron f_n. The resultant equation provided a simultaneous solution for r_x.

$$\frac{V_t}{2\pi n r_p} = \frac{\sqrt{(F_{\max} / r_x) / M_{-e}}}{2\pi} \tag{10}$$

Equation (10) was solved for r_x, resulting in Equation (11).

$$r_x = n^2 [\frac{F_{\max} r_p^{\ 2}}{V_t^2 M_{-e}}] \tag{11}$$

The quantity within the brackets equals the ground state radius of the hydrogen atom. The reduction of the terms within the brackets produced Equation (12).

$$r_x = n^2 r_{+h} \tag{12}$$

The result r_x equals the radii of the hydrogen atom. A condition of energetic accessibility exists at points where the natural frequency of the electron equals the frequency of the transitional quantum state. The energy levels of the atoms exist at points of electromagnetic and gravitomagnetic accessibility.

THE INTENSITY OF SPECTRAL EMISSION

The intensity of the spectral lines was qualified by Heisenberg. He described the position of an electron with a sum of component waves. He placed these component waves into the formula of harmonic motion. Bohr's quantum condition was then factored in as a special ingredient. Heisenberg found that the intensity of the spectral lines is a function of the square of the amplitude of the stationary quantum state. The great scientists knew nothing of the path of the quantum transition. Their solutions did not incorporate the probability of transition. The author claims to have discovered the path of the quantum transition. This construct is centered upon the probability of transition. The amplitude (displacement) of vibration at the dimensional frequency of 1.094 megahertz-meters squared is proportionate to the probability of transition.

The transitional electron may be described in terms of its circumferential velocity. Equation (13) describes the spin of the transitional quantum state.

$$\omega r = V_t \tag{13}$$

Angular frequency n times radius of energetic accessibility r_p equals the velocity of the transitional quantum state.

$$(2\pi f) r = \sqrt{K_{-e} / M_{-e}}\, n r_p \tag{14}$$

Equation (14) was squared, reduced, and solved for r. Equation (15) expresses the amplitude of the transitional quantum state squared.

$$r^2 = \frac{K_{-e} n^2 r_p^{\ 2}}{4\pi^2 M_{-e} f^2} \tag{15}$$

The transitional frequency f of the daughter state is a harmonic multiple of the transitional frequency of the parent state. The product of the transitional frequency, given by Equation (7), and the integer n was factored into Equation (16). Equation (16) expresses the transitional amplitude in terms of the product of the amplitudes of the parent and the daughter states.

$$r^2 = [\frac{2\pi K_{-e} r_p^{\ 3}}{V_t}](\frac{n^2}{4\pi^2 M^{-e} f}) \tag{16}$$

The elastic constant of the electron was expressed in terms of lengths of energetic accessibility in Equation (17).

$$K_{-e} = \frac{F_{\max}}{n r_p} \tag{17}$$

The numerator and denominator of Equation (16) were multiplied by a factor of two. The elastic constant of the electron, Equation (17), was also factored into Equation (18).

$$r^2 = [\frac{4\pi F_{\max} r_p^{\ 2}}{V_t}](\frac{n}{8\pi^2 M_{-e} f}) \tag{18}$$

The factors within the brackets equal Planck's constant. The reduction of the terms within the brackets produced Equation (19), Heisenberg's formulation for the amplitude of electronic harmonic motion squared.

$$r^2 = \frac{nh}{8\pi^2 M_{-e} f} \tag{19}$$

This formulation expresses the numerical intensity of the emitted photons. The intensity of a spectral line is a function of the probability of transition. The probability of transition is proportionate to the product of the transitional amplitudes of the parent and daughter states. These constructs reform the foundation of modern physics. This reformation is classical. It may be possible to influence these classical parameters and construct devices that directly employ all four of the natural forces. This control will lead to the development of many new technologies. The amplitude of a nuclear state is small. The amplitude of a lattice vibration is large. The product of these two amplitudes is great enough to allow a cold fusion reaction to proceed.

CONCLUSION

A low energy condition exists that affects the natural forces. This condition is dynamic. It consists of a vibrating Bose condensate. The vibration of a Bose condensate at the dimensional frequency of 1.094 megahertz-meters appears to increase the strength of the phonons that bind the condensate. This increased strength invites nuclear participation. Superconductors and proton conductors can be externally vibrated to harness the effect. The process is that of the quantum transition. This new understanding may allow a multi-bodied macroscopic object to be placed into a state of quantum transition. Trillions of atoms may be enjoined within a single state of quantum transition. Strong gravitational and long-range nuclear effects will be produced. The long-range nuclear effects may be used for the production of energy and the reduction of nuclear waste. The strong gravitational effects may be used for propulsion.

NOMENCLATURE

F_c	=	1.236×10^{20} hertz
F_{max}	=	29.05 Newtons
M_{-e}	=	9.109×10^{-31} kg
r_p	=	1.409×10^{-15} meters
r_{+h}	=	$.529 \times 10^{-10}$ meters
V_t	=	1.094×10^{6} hertz-meters

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About the Author

Frank Znidarsic graduated from the University of Pittsburgh with a B.S. in Electrical Engineering in 1975. He is current-

ly a Registered Professional Engineer in the state of Pennsylvania. In the 1980s, he went on to obtain an A.S in Business Administration at St. Francis College. He studied physics at the University of Indiana in the 1990s. Frank has been employed as an engineer in the steel, mining, and utility industries. Most recently he was contracted by Alstom Power to start up power plants in North Carolina.

*Email: fznidarsic@aol.com