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Superluminal Speeds and Superconductivity

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Abstract:

Both superluminal velocities and superconductivity are shown to devolve naturally from the generalized equations of motion identified in an earlier paper[1]. The behavior of "mass" as it approaches and exceeds light speed under uniform acceleration is illustrated and the statistical anomaly of barrier potential tunnelling is resolved. A significant difference between the angular and linear velocities involved in orbital motion is identified.

Introduction:

Sufficient experimental evidence exists for superluminal velocities although such is not accepted by the scientific community. This is primarily due to the assumed limitations on light speed imposed by special relativity and classical electrodynamics as well as the lack of a sound theoretical basis for exceeding it. Conversely, superconductivity is a well-established and recognized phenomenon but it also suffers from the absence of a comprehensive theory. In the following, it is shown they are both readily explained by one theory and identified as the extreme positions of kinetic and potential energies.

Background Summary:

The existence of a dual particle-field/antiparticle-field was established in the above-mentioned paper as a conclusion derived from the Bohr equivalence of mechanical and electromagnetic configurations. This was further supported by the simplification of A. Einstein's equations involving the relationship between squared momentum and squared kinetic energy; the latter being resolved into the opposing vectors related to angular velocity[2]. The final proof lay in the discovery of a third (inertial) velocity in Newtonian momentum, through an analysis of the Compton effect.

Inertia was identified as the result of the antithetical arrangement of dual states and Newton's third law. The aether was shown to be an attribute of the particle with electromagnetic radiation defined as a release of potential (dual particle-field/antiparticle-field displacement). Eg. Disregarding artificial excitation levels, a collision or orbital coupling is accompanied by the release of radiant kinetic energy commensurate with the reduced mass of classical mechanics.

$$m_1m_2/(m_1 + m_2) \qquad \textbf{(1)}$$

The opposite effect; the release of potential energy accompanies ionization.

$m_1 m_u/(m_1 - m_u)$ where m_u signifies the "reduced mass" **(2)**

It would appear that partial emissions apply, depending on impact angle or excitation levels of orbitals. This is by no means certain in view of the quantization of the photon and the dependency of frequency on relative motion.

The identity and relationship among the 3 velocities are as follows:

v_m = linear, orbital: v_k = angular: v_n = inertial

$$\beta = [1 - (v_m^2/c^2)]^{1/2} = \beta_1 = 1 - (v_k^2/2c^2) \quad \textbf{(3)}$$

The standard relativistic equations relating to momentum and kinetic energy.

$$v_m^2 = v_k^2 - (v_k^4/4c^2) \quad \textbf{(4)}$$

The relationship between the squared velocities of linear and angular momentum

$$v_m v_n = v_k^2 \quad \textbf{(5)}$$

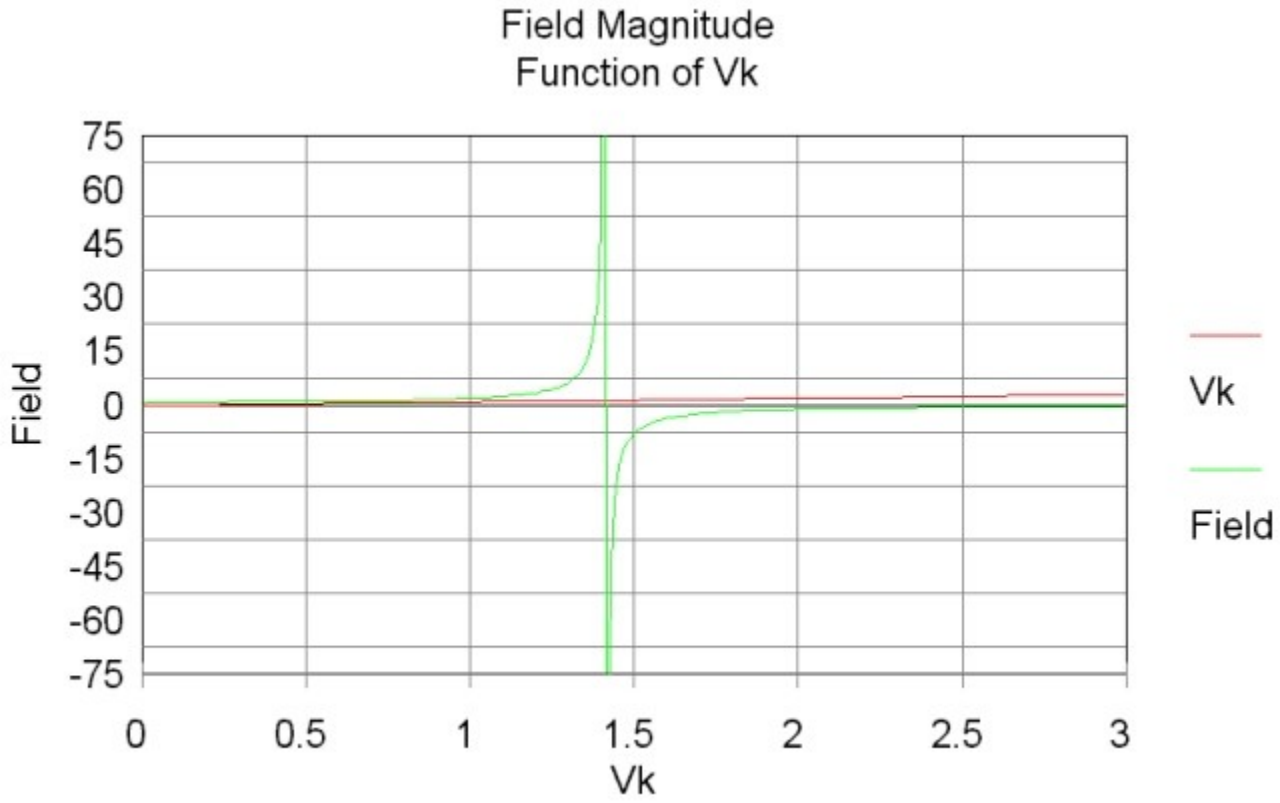
The amazingly simple parabolic relationship between speeds associated with angular velocity and the kinetic and inertial velocities. This is also related directly to energy transfer between states. Note that (5) represents a geometric progression; v_k the geometric mean.

$$v_m/v_n = 1 - (v_k^2/4c^2) \quad \textbf{(6)}$$

The ratio between inertial and kinetic velocities.

Mass, Inertia and the Speed of Light:

Equation (4) specifically relates to the experimental configuration of mass spectrometry with the appearance of the induced field of classical electromagnetic theory. This should now be viewed as a displacement (inertial effect) between dual states. The increment is equivalent to the application of the relativistic [β] or [β_1] and a calculation of the magnitude of this field with incremental speeds is plotted as a function of [v_k] below. This is equal to energy levels at various intervals resulting from a uniform acceleration. Note: Initial field = 1 = c



As [v_m] approaches c, the inertial field becomes infinitely large, but collapses at precisely the point where [v_m = c, vk = $2^{1/2}$c, v_n = 2c] and equation (4) becomes,

$$c^2 = 2c^2 - (4c^4/4c^2) \qquad \textbf{(7)}$$

We may conclude that the inertial field precisely balances mass at this point. It is tempting to state that mass is entirely converted to energy [$E = mc^2$], but there is no indication of particle dissolution. The inversive behavior of the inertial field suggests the creation of the so-called "antiparticle" at some point beyond. While the balance of inertia and mass would not appear to happen in free space, it would be a natural occurrence under the large accelerations of a Coulomb attraction. In accordance with the above, barrier penetration would occur at approximately 2.8^{-13}cm and a charge reversal would be exhibited at some point beyond.

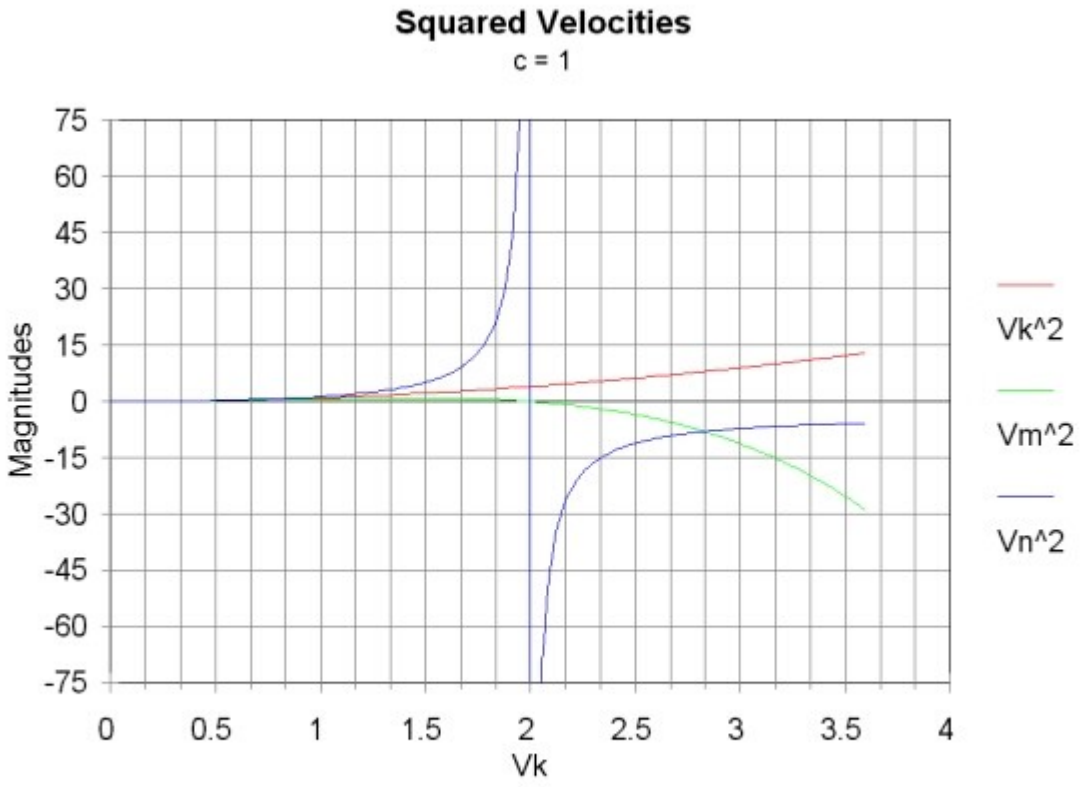
Addendum, Sep. 3 2007: In reference to a previous paper, the creation of the positron would occur where the angular velocity [v_k] equalled [c], ($m_o/1\text{-}v_k^2/c^2$). The "mass" is doubled at this point. At some incremental velocity beyond, a separation would occur, analogous to Dirac's theory. As [v_k approaches [$2^{1/2}$c], the equation represents radiation (infinite mass counterbalanced by its antithesis). This may be construed as either the velocity of escape, or electron-positron separation at infinity. Another possibility is a separation where [v_k] equals [2c]. At this point or beyond, the relativistic equation creates a single particle with negative "mass". More likely, the particle "created" is a proton.

Note **the angular velocity exceeds the linear** as indicated in equation (4). This is distinct from classical mechanics where they are considered equal. An anlysis of the anomalous acceleration of the Pioneer 10 spacecraft may confirm this to be the cause.

Light speed was shown to be a function of the aether and the above equations reveal aspects of its structure. This will be covered in a subsequent paper.

Superluminal Speeds and Superconductivity:

The question arises as to what limits may be imposed on the three speeds? This was explored by plotting the squared velocities as a function of $[v_k]$



As v_k approaches 2c, $[v_n]$ approaches infinity and $[v_m]$ approaches zero. At precisely [2c], there is an abrupt cessation of all linear motion and then a reversal of speeds beyond that point. (The existence of angular velocity at this point suggests particle spin.) This is analogous to behavior at the repulsive core of the atomic nucleus[3].

Of significance is the existence of the velocities, c, 2c and infinity in direct correspondence with the results of the Pappas-Obolensky experiments[4]. Equally important is the included statement, "for the coaxial line to operate at the superluminal velocity... it was necessary not to be near bulky objects or the ground and not to undergo sharp bends..." From this we may conclude the obvious; that impedance or the presence of mass limits the velocity.

Velocities beyond those indicated do not appear to be significant although the absolute values are all equal at $8^{1/2}c$.

Conclusion:

It is obvious by this analysis that mass is either offset by the field or diminishes with speed to the point where it becomes an electromagnetic wave. Conversly, mass is created with cessation of speed provided sufficient energy is available to create a stable particle. This conclusion is in direct

opposition to the assumptions of special relativity.

Linear motion may easily be generalized to include orbitals, and in the above, there is a direct analogy with Newtonian mechanics and eliptical, parabolic and hyperbolic configurations. However in this case escape or ionization is not inferred, but the actual transfer (inversion) between the dual states. **All fundamental geometries exist simultaneously.** The unification of all forces is now simply a matter of identifying a number of specifics. While this paper provides a theoretical basis for the findings of the Pappas-Obolensky experiments, it is equally true that the experiments are physical proof of the existence of the three velocities and of the dual states.

We may further state that in superluminal speeds, we find the extremes of kinetic energy and with the cessation of speed, the ultimate expression of potential energy - superconductivity. In their proximity we find a conjuction of opposites cast in the finest traditions of metaphysical speculation. This is indeed the "morning of the magicians".

Comment/Reference:

[1]The Synthesis of Quantum Electrodynamics, Special Relativity and Classical Mechanics, Walter Babin, http://wbabin.net/babin/wd6.htm, July 9, 2002

[2]Only two possibilities exist for $[v_k]$; that of angular velocity or intrinsic spin. Angular velocity is here indicated although the latter is not necessarily excluded.

[3]Nuclear Physics, Wiley & Sons, 1987, p 104: Kenneth S. Krane

[4]Thirty-Six Nanoseconds Faster Than Light, P.T. Pappas, Alexis Guy Obolensky, Article, Electronics & Wireless World, December, 1988