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Cherenkov's Particles as Magnetons

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Abstract: The article will show that the formula for Cherenkov's radiation can be clearly derived from Special Relativity Theory although the speeds of particles surpass the speed of light. It indicates that Special Relativity Theory is able to describe the dynamics of faster-than-light charged particles. If it is correct that such faster-than-light particles must have imaginary values for their electrostatic charges, then they must be true magnetons.
Keywords: magnetic monopole, magneton, faster-than-light particles.

Introduction

The consideration of faster-than-light (FTL) particles via formulas of the conservation law of momentum and mass dilatation from Special Relativity Theory gives the exact Cherenkov's effect equation for angle of the photons' radiation. If we accept the electromagnetic rule that magnetic field can be described as the imaginary part of an electromagnetic (EM) field and also as the imaginary part of Maxwell's equation, then the direct application of the equations that already yield the correct formula for Cherenkov's effect on the charge of a Cherenkov particle results in the conclusion, that Cherenkov's particle is a magnetic monopole, i.e., the magneton.

Magnetons & Tachyons

It will be shown in the text below that a Cherenkov particle is a magnetic monopole. The field can be generally assorted on the diavacuum and paravacuum fields. The diavacuum fields reject the vacuum (space without the field) from the source, and the paravacuum fields attract the vacuum (or the object without the field) to the source. Thus the electrostatic field attracts the vacuum to pole, and magnetic and gravitational field rejects the vacuum from the source (Meissner effect).

The general equation of the poles attraction can be described by the next formula:

$$\left|\vec{F}\right| = k \cdot \frac{\left(p_1 \cdot \left(1 + (i-1) \cdot \delta_{1,t_{p1}}\right)\right) \cdot \left(p_2 \cdot \left(1 + (i-1) \cdot \delta_{1,t_{p2}}\right)\right)}{\vec{r}^{\,2}} \quad (1),$$

where are:

- p = quantity value of the pole charge,
- k = constant of the field,
- t_p = type of field and it is 0 or 1: the 0 is value for electrostatic, and the 1 is value for the magnetic and gravitational fields,
- r = radius between poles,
- i = $\sqrt{-1}$, i.e. imaginary unit,

$$\delta_{x,y} = \begin{cases} 1, & x = y \\ 0, & x \neq y \end{cases}$$

The Archimedes force formula can be derived from the force of the repulsion of globe without the field from the pole:

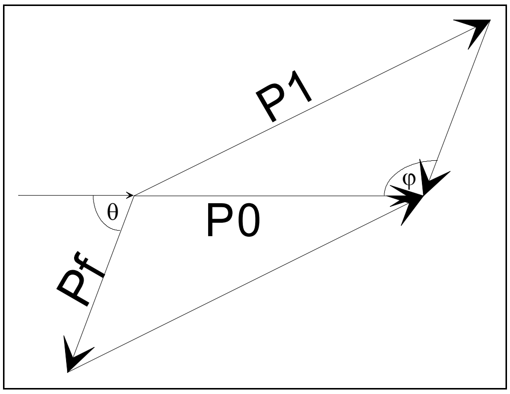
$$\vec{F} = \oint_S P \cdot d\vec{S} = \int_V \vec{\nabla} P \cdot dV = \int_V \vec{\nabla}\left(\frac{dU}{dV}\right) \cdot dV = \int_V \vec{\nabla}\left(\frac{\left(k \cdot \frac{p \cdot \left(1 + (i-1) \cdot \delta_{1,t_p}\right)}{r^2}\right)^2}{8 \cdot \pi \cdot k}\right) \cdot dV \qquad (2),$$

i.e.:

$$F = k \cdot \frac{p^2 \cdot (-1)^{t_p}}{4} \cdot \left(\frac{r \cdot \left(d^2 + r^2\right)}{d \cdot \left(d^2 - r^2\right)^2} - \frac{Ln\left(\frac{d+r}{d-r}\right)}{2 \cdot d^2}\right) \qquad (3).$$

Where are:

- p = the charge of the field's pole,
- t_p = type of the field, $t_p \in [0, 1]$,
- d = the distance from the center of vacuum globe to field's pole,
- r = radius of the vacuum globe.



Vector description of the Cherenkov radiation.

This formula shows that the fields whose poles of the same sign are in attraction – repulse the vacuum, and the fields that have attraction of the different sign poles – attract the vacuum. By the above demonstration is shown that the physical fields behave complex in the mathematics sense.

By consideration of equation (1) is concluded that the interaction between imaginary ($t_p = 1$) and real fields ($t_p = 0$), gives the imaginary force that performs imaginary work. These forces are known as conservative forces and the main characteristic of these forces is that they are always perpendicular to the velocity vectors (e. g. that is the case between interaction of the electric field (i. e. pole) and the magnetic field.

A tachyon is a particle that is faster than light and it has complex value of the pole charge whereby these presumptions give a correct formula of the Cherenkov's effect:

$$\vec{P}_1^{\,2} = \vec{P}_0^{\,2} + \vec{P}_\nu^{\,2} - 2 \cdot \left|\vec{P}_0\right| \cdot \left|\vec{P}_\nu\right| \cdot COS(\varphi) = \vec{P}_0^{\,2} + \vec{P}_\nu^{\,2} + 2 \cdot \left|\vec{P}_0\right| \cdot \left|\vec{P}_\nu\right| \cdot COS(\theta) \qquad (4).$$

While the next four relations are valid:

$$E_0 - E_\nu = E_1 \qquad (5)$$

$$P_\nu = \frac{E_\nu}{c} \qquad (6)$$

$$P_0 = \frac{\sqrt{E_0^{\ 2} - E_{stat}^{\ \ 2}}}{c} \tag{7}$$

$$P_1 = \frac{\sqrt{E_1^{\ 2} - E_{stat}^{\ \ 2}}}{c} \tag{8}.$$

With the direct involvement of (5), (6), (7) and (8) in (4), the well-known formula for Cherenkov radiation is obtained:

$$2 \cdot E_v \cdot E_{stat} \cdot (c^2 - v^2) \cdot (v \cdot COS(\theta) - c) = 0 \tag{9},$$

i.e.

$$\boxed{COS(\theta) = \frac{c}{v}} \tag{10}.$$

From the all of the above it can be concluded that Cherenkov particles are magnetons and that in magnetic fields they will move along the magnetic field lines. It means that whenever a charged particle is moving faster than light, the conservative (passive) force of the magnetic field becomes the active force that has an effect on the particle, changing the kinetic energy. θ is the angle of cone in which the particle's electric field exists. The space angle of field in the steradian is given by the formula:

$$\Omega = 2 \cdot \pi \cdot \left(1 - \frac{c}{v}\right) \tag{11}.$$

The coefficient of the space occupation is defined by the formula:

$$\eta = \frac{\Omega}{4 \cdot \pi} = \frac{1}{2} \cdot \left(1 - \frac{c}{v}\right) \tag{12}.$$

The ordinary particle has a space occupation coefficient equal to 1, but whenever the particle is moving faster than light this coefficient is less then 1. This practically means that fields of particle that move slower than the light occupy the whole space, and when it is moving faster then light its field occupies only the cone and photons are emitted only on edge or surface of the cone, i.e. discontinuity couple. The conform transformation of whole space into cone space can be found to determine the distribution of field in the cone.

The case of the relativistic declination in electric field is:

$$\frac{m_0}{\sqrt{1 - \frac{\vec{v}^2}{c^2}}} \cdot \vec{a} = e_0 \cdot \vec{E} \tag{13}.$$

If we assume that the inertial mass is constant, and that the intensity of the interaction with the field is only changed, it can be accepted:

$$m_e \cdot \vec{a} = \vec{E} \cdot e_0 \cdot \sqrt{1 - \frac{v^2}{c^2}} \tag{14}.$$

The first case:

$$\left|\vec{v}\right| < c \quad \Rightarrow \quad \vec{F} = \left(Q_0 \cdot \sqrt{1 - \frac{v^2}{c^2}} \right) \cdot \vec{v} \times \vec{B} \qquad (15).$$

The second case:

$$\left|\vec{v}\right| > c \quad \Rightarrow \quad \vec{F} = \left(-Q_0 \cdot \sqrt{\frac{v^2}{c^2} - 1} \right) \cdot \frac{\vec{B}}{c} \qquad (16).$$

Conclusion

Whenever the magneton discharge a photon in opposite direction of its motion, its speed and momentum decreases. That means that the magneton has imaginary momentum. But, while the photon is a dialectic particle, which has at one moment electric field and in the other a magnetic one, its momentum is in the moment of creation an imaginary one because in that moment, the photon is magnetic field because it is radiated by the magnetic particle. Thus the photon is the bridge between two worlds: tachyonian (imaginary) and ordinary (real) word. Between the two worlds can exist only the particles that have characteristics of the both worlds such as photons. With generalization, it can be concluded that two magnetons have the same kind of force as two gravitational masses. Further generalization shows that these two also do not have electric fields from the front sides of movement.

Proof that all of these things are valid is indirectly derived from the procedure that gives the correct Cherenkov formula with a little extension: if the correct Cherenkov formula is obtained then the inertial mass and the electrical charge are complex variables in mathematical sense. And if the inertial mass and electrical charge are complex variables then the Cherenkov particle is a magneton. Furthermore, the inertial behavior has to have its origin in electromagnetic filed.

Experimental testing is supremely simple and consisted only of the observation of the motion of the Cherenkov particles in the magnetic field. If the chargeable particle starts moving towards magneto field lines, than it is a magneton (i.e. magnetic charge):

$$\left|\vec{v}\right| > c \quad \Rightarrow \quad \vec{F} = e_m \cdot \vec{B} \qquad (17).$$

But, if the particle is affected by perpendicular magnetic field lines, then the particle is still an electron (i.e. electric charge):

$$\left|\vec{v}\right| < c \quad \Rightarrow \quad \vec{F} = e_q \cdot \vec{v} \times \vec{B} \qquad (18).$$

This study predicts that the electron would show features according the formulas (17) and (18) when it was put in the magnetic field, but not only with the formula (18) which would be correct if the electron did not become the magneton in velocities faster than the speed of light in the medium that the particle is moving.

If it is so, it may have great influence on cold fusion theories because it means that a Chrenkov particle does not have an electrostatic field and thus it is able to penetrate directly into the target nucleus without electrostatic interaction, thereby causing fusion. The classification of fields may have great influence on antigravitation because it means that the electrostatic parameters of a medium have great influence on the mechanical characteristics of a particle (i.e. inertia and inertial mass). If it is so, it means that gravitational waves come from the annihilation of the electrostatic forces (see reference 2.). If there is annihilation of the opposite poles then there is gravitational pole, and if there is annihilation of the same poles there is antigravitation. While Bose-Einstein condensate contains same sign charged particles it has to be source of antigravitational poles and have a gravitational shield similar to magnetic field. Because the Meissner effect, a gravitational field has a positive force and it is possible to be make a device that will pump a gravitational field from a particular space into the device. It is similar to a hot-air balloon that is flying because the density of the air inside the balloon is less than that outside. When Bose-Einstein couples are moving there are short paths behind them due to retarded fields. These paths are exposed to the Meissner forces causing the antigravitational effect, which has already noticed and named as the Podkletonov effect.

The force acting on volume V without the $\vec{G}$ field is given by the following equation:

$$F \approx V \cdot \frac{g^2}{2 \cdot \pi \cdot \gamma \cdot r_{earth}} \approx V \cdot 36000 \frac{N}{m^3} \quad (19).$$

It means that 1 m^3 of vacuum (i.e. space without $\vec{G}$ field) on the surface of the Earth has the equivalent anti-weight of 3671 Kg. Weak gravitational fields could be used in telecommunications and the implementation of a strong gravitational field in the construction of a hot-fusion device makes the construction more simple than the one presently used by the electromagnetic Tocamacs.

References

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