Wave Nature of Elementary Particles and Absolute Motion - Superluminal Neutrinos

HenokTadesse, Electrical Engineer, BSc
Ethiopia, Debrezeit, POBox 412, Mobile: +251 910 751339 / +251 912 228639
email: *entkidmt@yahoo.com* or *wchmar@gmail.com*

21 June 2020

Abstract

The question of absolute motion has always been seen with respect to light (photons). The problem is often stated in terms of whether or not there is a light carrying medium (ether). However, if elementary particles such as electrons and neutrinos have wave properties, then the question of absolute motion should also apply to them. The superluminal neutrinos observed in 2011 (OPERA experiment) can be explained based on the wave property of neutrinos. It is proposed that the speed of neutrinos for a given set of experimental conditions is defined and constant with respect to absolute space. The observed 'superluminal' velocity of neutrinos is an apparent effect caused by absolute motion of the neutrino detector. Experiments based on an electron source, analogous to a light speed experiments, are proposed.

The problem of absolute motion is often stated in terms of whether or not there is a light carrying medium (ether). So far, there is no well-known (as far as I know) theoretical and experimental investigation of the problem of absolute motion with respect to elementary particles such as electrons and neutrinos.

The wave nature of electrons has been established by many experiments such as the electron double-slit experiment. This raises the question of whether an electron wave can be treated in an analogous way to light waves (photons). One may raise an unusual question: is the speed of electron waves independent of the electron source ? Can we think of a source of electron waves analogous to a source of light waves?

One additional evidence is the experimentally observed electron Sagnac effect, analogous to light (photon) Sagnac effect. Thus, the electron Sagnac effect may raise the same questions raised for light Sagnac effect.

I propose that the speed of electrons (or electron waves) ejected from an electron source is independent of the velocity of the electron source. This is analogous to the fact that the speed of light is constant independent of velocity of the light source. This may seem strange, but if electrons are waves, therefore the electron waves should behave in the same way as other waves. One property of waves is that, in contrast to classical or macroscopic particles, the speed of the wave is independent of the velocity of the source.

Proposed experiments

Moving source experiment

I propose an experiment to test the above hypothesis that the speed of an electron wave is independent of the speed of the electron source.

Assume that the speed of the electrons relative to the electron source is V and that the absolute velocity of the electron source is V_{abs}. If the source emits a pulse of electrons at a distance D from the detector, then the time taken by the pulse to travel the distance D will be:

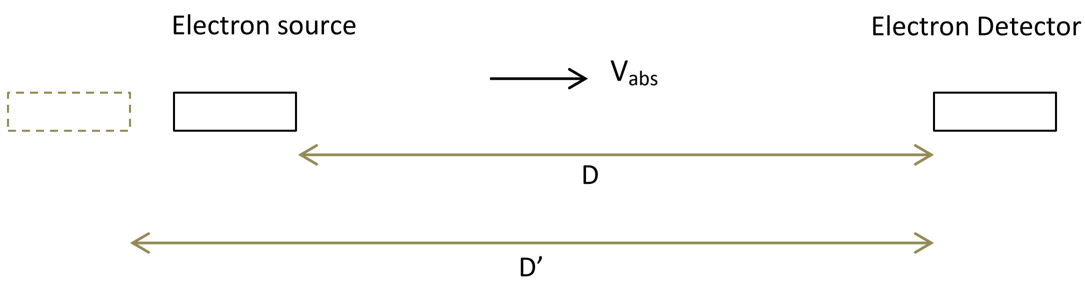
$$T = \frac{D}{V}$$

In the above formula, we have assumed that the speed of the electrons is independent of the speed of the electron source. Therefore, the speed of the electrons relative to the detector will be V, and not V_{abs} + V. This contradicts the behavior of macroscopic particles in which, for example, the velocity of a bullet is equal to the sum of the velocity of the bullet relative to the muzzle and the velocity of the muzzle itself.

Experiment to detect absolute motion

Next consider an experiment consisting of co-moving electron source and electron detector. The electron source and the electron detector are at rest relative to each other, but have a common absolute velocity. Thus, an electron source and an electron detector on earth, at relative rest, will have a common absolute velocity of 390 Km/s.

According to Apparent Source Theory [1][2], the effect of absolute velocity is to create an apparent change in position of the electron source relative to the electron detector.



Therefore, the time taken by an electron pulse will be:

$$T = \frac{D'}{V} = \frac{D\frac{V}{V - V_{abs}}}{V} = \frac{D}{V - V_{abs}}$$

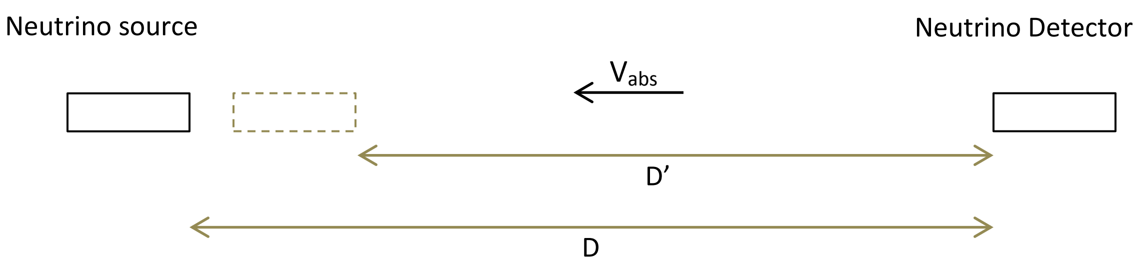
where V is the speed of the electrons relative to the electron source.

Thus, by changing the orientation of the axis of the experimental setup with the known direction of Earth's absolute velocity, which is towards constellation Leo, we can look for variations in time T.

A simple homemade experiment can be done by using CRT (cathode ray tube) television tube. The experiment consists of emitting a short electron pulse from the electron source and detecting the electrons on the screen, and noting the time elapsed for different orientations of the CRT tube in space.

Superluminal neutrinos

The superluminal neutrino anomaly (OPERA, 2011) can be explained based on the above experiment. The anomaly was said to have been traced to a faulty cable. If we choose not to believe this story, the anomaly can be explained by absolute motion.



The time taken by a neutrino pulse will be:

$$T = \frac{D'}{V} = \frac{D \dfrac{V}{V + V_{abs}}}{V} = \frac{D}{V + V_{abs}}$$

where V is the speed of the neutrinos relative to the neutrino source, D is the actual/physical source distance and D' is the apparent source distance.

In the case of the OPERA neutrino experiment

$$V \approx c$$

Therefore:

$$T = \frac{D'}{c} = \frac{D \dfrac{V}{c + V_{abs}}}{V} = \frac{D}{c + V_{abs}}$$

Therefore, according to absolute motion (Apparent Source Theory), the time delay will be:

$$T = \frac{D}{c + V_{abs}}$$

According to special theory of relativity:

$$T = \frac{D}{c}$$

The discrepancy between the predicted and observed time delays will be:

$$\Delta T = \frac{D}{c} - \frac{D}{c + V_{abs}} = D \frac{V_{abs}}{c\,(c + V_{abs})} \cong D \frac{V_{abs}}{c^2}$$

The effect of Earth's absolute velocity (390 km/s) in the OPERA and similar experiments may be obscured (suppressed) by the way the GPS operates. Nevertheless, if we assume a residual value of, say, 10 km/s for Earth's absolute velocity, we can estimate the discrepancy between predicted and measured time delays as follows. For simplicity we assume that the direction of this absolute velocity is parallel to the line connecting the source and the detector.

Therefore, for

D = 730 km , V_{abs} = 10 km/s

$$\Delta T = \cong \;\; D \; \frac{V_{abs}}{c^2} = 730 \; km \quad \frac{10 \, \frac{km}{s}}{\left(300000 \, \frac{km}{s}\right)^2} = 81 \; ns$$

which is of the same order of magnitude as that observed in the OPERA experiment, which is 60 nanoseconds.

That the GPS design and operation suppresses absolute velocity effects can also be seen from the fact that, although the Earth is moving with absolute velocity of 390 km/s in space, as confirmed by the Silvertooth experiment and the CMBR anisotropy experiment, practically no effect of absolute motion is observed in the GPS.

If atomic clocks at the source and at the detector are synchronized by another method, there will be a pronounced effect of absolute motion on the apparent superluminal neutrino velocity. The clocks can be synchronized by bringing the two clocks together, synchronizing them and transporting them back, the so-called slow clock transport. In this case, theoretically a maximum discrepancy between predicted and measured time delays can occur, for V_{abs} = 390 km/s.

$$\Delta T = \cong \;\; D \; \frac{V_{abs}}{c^2} = 730 \; km \quad \frac{390 \, \frac{km}{s}}{\left(300000 \, \frac{km}{s}\right)^2} = 3163 \; ns = 3.163 \; \mu s$$

Glory be to Almighty God Jesus Christ and His Mother, Our Lady Saint Virgin Mary

References

1. *Absolute/Relative Motion and the Speed of Light, Electromagnetism, Inertia and Universal Speed Limit c - an Alternative Interpretation and Theoretical Framework*, by Henok Tadesse, www.vixra.org

2. *A New Theoretical Framework of Absolute and Relative Motion, the Speed of Light, Electromagnetism and Gravity*, by Henok Tadesse, www.vixra.org