

Neutrinos faster than light speed

Abstract

September 2011: The OPERA neutrino anomaly was the detection by the OPERA experiment of subatomic particles, neutrinos, that appeared to travel faster than light. This result was publicly announced on September 2011. The apparent finding was a subject of inquiry and debate. It was considered anomalous since speeds higher than that of light in a vacuum are generally thought to violate special relativity. In this paper, published 28.12.2011, I offered an explanation of this anomaly based upon my article: <http://www.vixra.org/abs/1010.0035> (A Philosophical And Mathematical Theory Of Everything).

Updated 21.04.2013: In february 2012 the OPERA collaboration confirmed that the measurement result was based on two errors: 1. A link from a GPS receiver to the OPERA master clock was loose. 2. A clock on an electronic board ticked faster than expected. Correcting for the two found sources of error, results for neutrino speed appear to be consistent with the speed of light.

After the initial report from OPERA many physicists tried to reconcile the OPERA result and make sense of it, while many were actively trying to disprove the result. I, my self, as an independent amature scientist, found the september report from OPERA very interesting because it made me wonder if the “maximum speed limit” in nature (c) in some frames of references could be faster relative to the light speed measured above earth in vacuum.

We now know that the OPERA result was erroneous. But in “The Scharnhorst effect”, which is a hypothetical phenomenon, light signals travel faster than c between two closely spaced conducting plates. *“A prediction made by this assertion is that the speed of a photon will be increased if it travels between two Casimir plates. Because of the limited amount of space between the two plates, some virtual particles present in vacuum fluctuations will have wavelengths that are too large to fit between the plates. This causes the effective density of virtual particles between the plates to be lower than that outside the plates. Therefore, a photon that travels between these plates will spend less time interacting with virtual particles because there are fewer of them to slow it down. The ultimate effect would be to increase the apparent speed of that photon. The closer the plates are, the lower the virtual particle density, and the higher the speed of light. The effect, however, is predicted to be minuscule. A photon travelling between two plates that are 1 micrometer apart would increase the photon's speed by only about one part in 10^{36} . This change in light's speed is too small to be detected with current technology, which prevents the Scharnhorst effect from being tested at this time.”* (See reference 3). This effect could in theory lead to an increased “maximum speed limit” inside earth where the mass density is extremely high (where the amount of space between the particles is extremely limited relative to vacuum above earth). Because of this interesting hypothetical phenomom I have arrived to the conclusion to let my speculative analysis in the article published 28.12.2011 stand untouched, since it still gives an explanation of why the maximum speed limit (c) in some frames might be faster than lightspeed measured in vacuum (based upon my article: <http://www.vixra.org/abs/1010.0035> (A Philosophical And Mathematical Theory Of Everything). (My article “Neutrinos faster than light speed“, published 28.12.2011 in vixra.org, is also referred to in the database:

["http://web.mit.edu/redingtn/www/netadv/ftlNuSwift.html"](http://web.mit.edu/redingtn/www/netadv/ftlNuSwift.html) (at Massachusetts Institute of Technology) under the chapter "Neutrinos move faster in matter".

Why is neutrinos sent from Cern, through the earth, to the Opera detector in Gran Sasso, Italy, exceeding the light speed by about 0,0025 % ? My explanation is founded on the main equation in my theory mentioned above.

Main equation there is:

$$e = \frac{mc^2}{(1 + ((r \times (Ap1 / Ap2)) / RS))^2}$$

Where

r = Distance between particle 1 and 2

$Ap1/Ap2$ = Surface area of particle 1 / surface area of particle 2

RS = Distance between particle 1 and "All particles original state, the state of singularity, that (in my theory) surrounds / encircles the Universe (S)" for example, 46,5 billion light years (see reference 4)"

Neutrinos faster than light speed explained by my main equation:

c = Maximum Speed limit

Light speed measured above earth is: 299792,458 km/s

Let us see if c , the maximum speed limit, is faster than the light speed measured above earth to 299792,458 km/s:

First: This thesis, and my main equation and theory, is based on the following speculative assumption:

That the physical frame of reference inside earth is different relative to the physical frame of reference above earth.

On basis of that assumption I have set r to be equal to:

The distance between earth and the gravitational center in our local galaxy group, that lies somewhere between the Milky way and the Andromeda galaxy, about 1 250 000 lightyears from earth.

This fact must be part of the equation, here in r , when we shall calculate:

- Frame 1. Light speed, as measured above earth, relative to
- Frame 2. The speed limit, c , that might be higher inside the earth

The reason for this, frame 1, is that light above earth is, as far as I understand, mostly affected/bent by the gravitational center in our local galaxy group, other factors that might affect light above earth is in my opinion negligible. But, frame 2, inside the earth, is different because of the mass density there, and within that frame the relevant r must be close to 0, in my opinion.

OK. Let us go through the math based upon the main equation as described above:

$$\frac{e}{m} = \frac{c^2}{(1 + ((r \times (Ap1 / Ap2)) / RS))^2}$$

$$\frac{c^2}{e/m} = (1 + ((r \times (Ap1 / Ap2)) / RS))^2$$

$$\frac{c^2}{e/m} = (1 + ((1250000 \times (1/1)) / 46500000000))^2$$

$$\frac{c^2}{e/m} = 1,00005376416349$$

$$\sqrt{\frac{c^2}{e/m}} = \frac{c}{e/m} = 1,00002688172043$$

c (maximum speed limit inside earth) =

= 0,002688 % faster than light speed measured above earth

Explained on basis of the *momentum of a massless photon (p)*:

$$e = \text{lightspeed} \times p = \frac{e}{p} = \text{lightspeed} = \frac{c}{(1 + ((r \times (Ap1 / Ap2)) / RS))}$$

$$\frac{e}{p} = \text{lightspeed} = \frac{c}{(1 + ((1250000 \times (1/1)) / 46500000000))}$$

Lightspeed above earth is measured to: $299792,458 \frac{km}{s}$

$$299792,458 = \frac{c}{(1 + ((1250000 \times (1/1)) / 46500000000))}$$

$$299792,458 \times (1 + ((1250000 \times (1/1)) / 46500000000)) = c$$

$$c = 299800,516937043$$

$$\frac{c}{\text{Lightspeed above earth}} = \frac{299800,516937043}{299792,458} = 1,00002688172043$$

c (maximum speed limit inside earth) =

= 0,002688 % faster than light speed measured above earth

Conclusion: The result in this paper fits the result from the OPERA experiment. C, the maximum speed limit, is in this theory higher inside the earth. Because of this the neutrinos, sent from Cern to Opera in Gran Sasso, does not violate the speed limit C. Because of this there is not produced any vacuum Cherenkov effects, since they are not superluminal, hence within the speed limit C as described in this paper.

References:

1. <http://arxiv.org/abs/1109.4897>: 17.11.2011. Measurement of the neutrino velocity with the OPERA detector in the CNGS beam.
2. <http://www.vixra.org/abs/1010.0035>: A Philosophical And Mathematical Theory Of Everything.
3. http://en.wikipedia.org/wiki/Scharnhorst_effect
4. http://space.mit.edu/~kcooksey/teaching/AY5/MisconceptionsabouttheBigBang_ScientificAmerican.pdf