Possible explanation for speed of neutrinos, faster than light

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Abstract. The recent measurement of speed of muon neutrinos shows that it is possible that speed of neutrinos is faster than speed of light. Here an explanation is suggested, that this is a consequence of Scharnhorst effect. This effect shows that photons propagating through vacuum are modifying in virtual pairs electron-positron for a while and thus the measured speed of light is really lower than one maximal possible speed of light in short moments. Because neutrinos are not modifying so, author supposes that their speed is larger than speed of photons.

1. Explanation

The measurement of speed of muon neutrinos shows that it is possible that speed of neutrinos is faster than speed of light [1]. If this measurement is correct, here an explanation is shown, that this is a consequence of Scharnhorst effect [2, 3].

Scharnhorst's calculation shows that a photon when is flying through vacuum is modifying in pairs electron-positron for short time intervals. If we put two plates very close together and make vacuum between them, these pairs arise more rarely and speed of light is a little bit faster.

Neutrinos does not interact electromagnetically with vacuum, therefore it is possible that their macroscopical speed is a little bit larger than the measured speed of light. Differently said, vacuum polarization induces an effective refractive index; neutrinos, not interacting electromagnetically, would not see this effect, and thus could travel faster than photons do in a vacuum.

Measurement with Opera detector needs confirmation with another measurement. Because of big precision of this measurement it is possible that this measurement will be confirmed.

2. Consequences

It seems that space-time is only a consequence of elementary particle masses [4, 5]. Special relativity [6] already gives that time runs only in rest matter and general relativity gives that space-time is background free. Thus, an option is that relations among elementary particles create space-time. Thus it can be expected that speeds among particles on approximately Planck distances are almost infinite, but when larger and larger space is created, speed of light is reduced to measured speed of light.

Confirmation of the above measurement will be a little piece of confirmation of the above theory.

References

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