

Variation of Light Speed with Frequency

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See Unified Absolute Relativity Theory at:

www.wbabin.net/saraiva/saraiva105.pdf

www.wbabin.net/saraiva/saraiva223.pdf

There's a big problem with my theory: according to it light speed varies with the frequency.

$$w = \sqrt{c^2 - kf^2} \quad ; \quad k = 1.9 \times 10^{-34} m^2$$

But there are two observations of the light speed at great distances in space that seems to prove that light speed is invariant.

We also know that radio waves from pulsars suffer dispersion due to the free electrons in space.

According my theory higher frequencies travel slowly, according to pulsar dispersion higher frequencies travel faster. It's possible that for great distances the two effects cancel.

The two observations:

$$f_1 = 7.3 \times 10^{18} \text{ Hz} \quad \text{and} \quad f_2 = 4.8 \times 10^{19} \quad \Leftrightarrow \quad \Delta c / c = 6.3 \times 10^{-21}$$

$$f_1 = 2.4 \times 10^{18} \quad \text{and} \quad f_2 = 7.1 \times 10^{24} \quad \Leftrightarrow \quad \Delta c / c = 4.2 \times 10^{-18}$$

New pulsar dispersion formula (semi empirical, SI units):

$$\Delta t = 10^{-23} D.n_e \frac{f_2^2 - f_1^2}{f_1 f_2}$$

UART formula:

$$\Delta t = \frac{D.k}{2c^3} (f_1^2 - f_2^2)$$

Δt -- Time delay; D – distance; n_e -- number of electrons per cubic meter;

Pulsars:

$$\Delta c / c = 10^{-23} c n_e \frac{f_2^2 - f_1^2}{f_1 f_2}$$

UART:

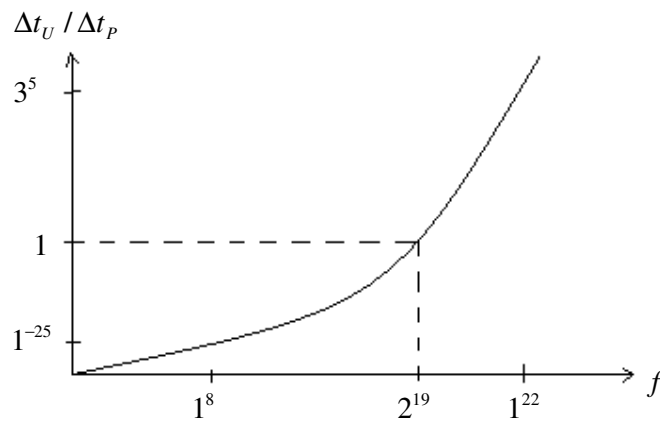
$$\Delta c / c = \frac{k}{2c^2} (f_1^2 - f_2^2)$$

$$\Delta t_{pulsar} + \Delta t_{uart} = 0 \quad \Leftrightarrow \quad f = 2 \times 10^{19} \text{ Hz}$$

$$\frac{\Delta t_{uart}}{\Delta t_{pulsar}} = \frac{k f^2}{2c^3 10^{-23} n_e}$$

For pulsars: $n_e \approx 3.2 \times 10^4 \text{ m}^{-3}$

For interstellar distances: $n_e \approx 1.3 \times 10^2 \text{ m}^{-3}$



This explains the first observation. For the second we think that the frequency $f_2 = 7.1^{24} \text{ Hz}$ is not a wave but a particle at high speed, so it gets the same speed as the waves that accelerate it.

There's a way of testing my opinion, making an observation for a frequency near $f = 10^{22}$. Note that I don't trust the pulsar formula, it can be different.

One thing is certain: from the pulsar effect light speed from great distances must have delays. So, is necessary to explain why we don't see any or very small delays.