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Michelson's Experiment and Other Things

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Michelson's experiment was made for detecting the relative speed of the experimental device in the vacuum. We know that the earth is moving in space so, if light speed is relative, we are able to detect this movement. So, it is necessary that light in the device propagates in the vacuum. But that is impossible at earth's surface because light moves in the earth's gravitational field that is at rest relative to the device.

There is another problem with the experiment. Light is not moving in the vacuum or in the earth's gravitational field. **It is moving in air**. **How can we detect the movement relative to the vacuum if light propagates in air?**

And this experiment is the only experimental basis for light speed constancy.

That's the problem with null result experiments. The experiment can be wrong and we still get the expected result.

Dark matter

Theorical mass of the universe:

$$M_U = 1.76 \times 10^{53} kg$$

Observed mass of the universe:

$$M_O = 3 \times 10^{52} \qquad (17\%)$$

We think that the dark energy doesn't exist, but in any case it has no mass.

Number of neutrinos in the universe:

$$n = 1 \times 10^{88}$$

Average mass of the tree types of the neutrinos:

$$\frac{M_U - M_O}{n} = 1.5 \times 10^{-35}$$

The electron neutrino mass:

$$m_{ve} = 4 \times 10^{-36}$$

The muon and tau neutrinos have greater masses.

Temperature

The temperature is an energy surface density:

$$T = \frac{E}{A}$$

But the area is always relative to a sphere:

$$A = 4\pi R^2$$

Volume: $V = \frac{4}{3}\pi R^3$, so:

$$T = \frac{E}{\sqrt[3]{36\pi . V^2}}$$

For the energy of the sun at earth distance for an object located in the vacuum:

$$T = 0.29 \frac{E}{\sqrt[3]{36\pi . V^2}}$$