Length dilation

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Abstract : Another hypothesis to explain the Michelson-Morley experiment : the dilation of the length in the direction perpendicular to the movement.

In a right triangle (x,y,r), we have : $r^2 = x^2 + y^2$

$$x^2 = r^2 - y^2 = (r-y)(r+y) = r^2 \left(1 - \frac{y}{r}\right)\left(1 + \frac{y}{r}\right)$$

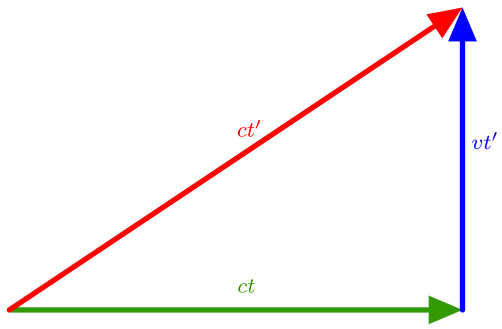
$$\frac{r^2}{x^2} = \frac{1}{(1-\frac{y}{r})(1+\frac{y}{r})} = \frac{1}{\frac{x^2}{r^2}} = \frac{1}{\cos^2(\alpha)} = \frac{1}{1-\sin^2(\alpha)}$$

In the right triangle : $\sin(\alpha) = \frac{y}{r}$, i.e :

$$\frac{1}{1-(\frac{y}{r})^2} = \frac{1}{(1-\frac{y}{r})(1+\frac{y}{r})} = \left(\frac{1}{\sqrt{1-\frac{y^2}{r^2}}}\right)^2$$

From the figure 1 :

$$\begin{cases} x = ct \\ y = vt' \\ r = ct' \end{cases}$$



$$Fig: 1$$

we have :

$$\frac{1}{1-(\frac{v}{c})^2} = \gamma^2 = \frac{1}{(1-\frac{v}{c})(1+\frac{v}{c})} = k\bar{k}$$

we have an inversion with respect to the circle of radius γ.

from where :

$$k+\bar{k} = \frac{\gamma^2}{\bar{k}} + \frac{\gamma^2}{k} = \gamma^2(\frac{1}{k}+\frac{1}{\bar{k}})$$

$$k+\bar{k} = \frac{1}{1-\frac{v}{c}} + \frac{1}{1+\frac{v}{c}} = 2\gamma^2$$

it is a mathematical relation [I] that can be multiplied by a constancy L/c :

$$(k+\bar{k})L/c = 2\gamma^2 L/c \quad (*)$$

That we can rewrite :

$$\sqrt{1-\beta^2}(k+\bar{k})L/c = 2\gamma L/c \quad (**)$$

-Lorentz's hypothesis : contraction in the direction of movementt (**)

$$\mathcal{L} = \sqrt{1-\beta^2}L$$

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-Another hypothesis : dilation in the direction perpendicular to the movement (*)

$$\bar{\mathcal{L}} = \gamma L$$

The two hypotheses have the right to exist physically to explain the mathematical relation (*).

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[I] https ://vixra.org/pdf/2006.0280v6.pdf