the Quantummachine

Physics

4-th speed projection revisited

Author: Cesar Sirvent
Date: 11-02-03 05:59

I have updated my suggestion that 4-th speed projection into space is the spatial v-speed, showing the corrected formulae, contained in this graphics. I had mistakenly assumed that the rotation was not real, as in the case of Minkowsky diagrams.

If you work out the maths, then things are not as I said (the speed v in space cannot be the projection of the 4-th speed into the space, because if you assume so, the time dilatation and length contraction formulae which follow does not correspond to those derived from the Lorentz transformations).

Assuming that the rotation is real, and that the diagram axes correspond to proper time and proper LENGTH (and not proper time and proper x, as always assumed), it is quite obvious that all maths fit.

Interestingly enough, all the Lorentz transformations could be deduced from these 3 postulates:

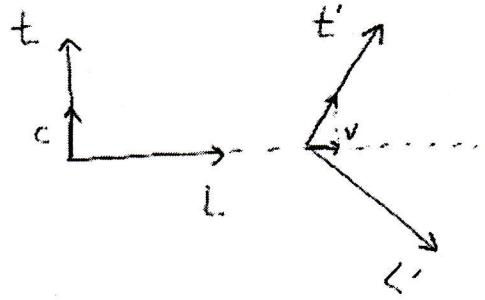
1) PcR - Principle of Relativity.

2) The objects move in time with a constant "flow" c. It is the projection of this "flow" into space which causes something to move. When something is moving, its coordinate system is rotated a real angle about the time axis.

3) Time and space are 2 orthogonal dimensions.

The point 2 could have been imagined by the mental experiments of Einstein, who tried to guess what an observer moving at the speed of light would see if moving with a light ray.

For the same concept applied to curved space see the second diagram.



1) Assumption:

$V = c \cdot \cos\theta$

So, $\cos\theta = \frac{V}{c}$

$\cos^2\theta + \sin^2\theta = 1$

$\sin\theta = \sqrt{1 - V^2/c^2} \rightarrow \theta = \arcsin\left(\sqrt{1 - V^2/c^2}\right)$

Time dilation:

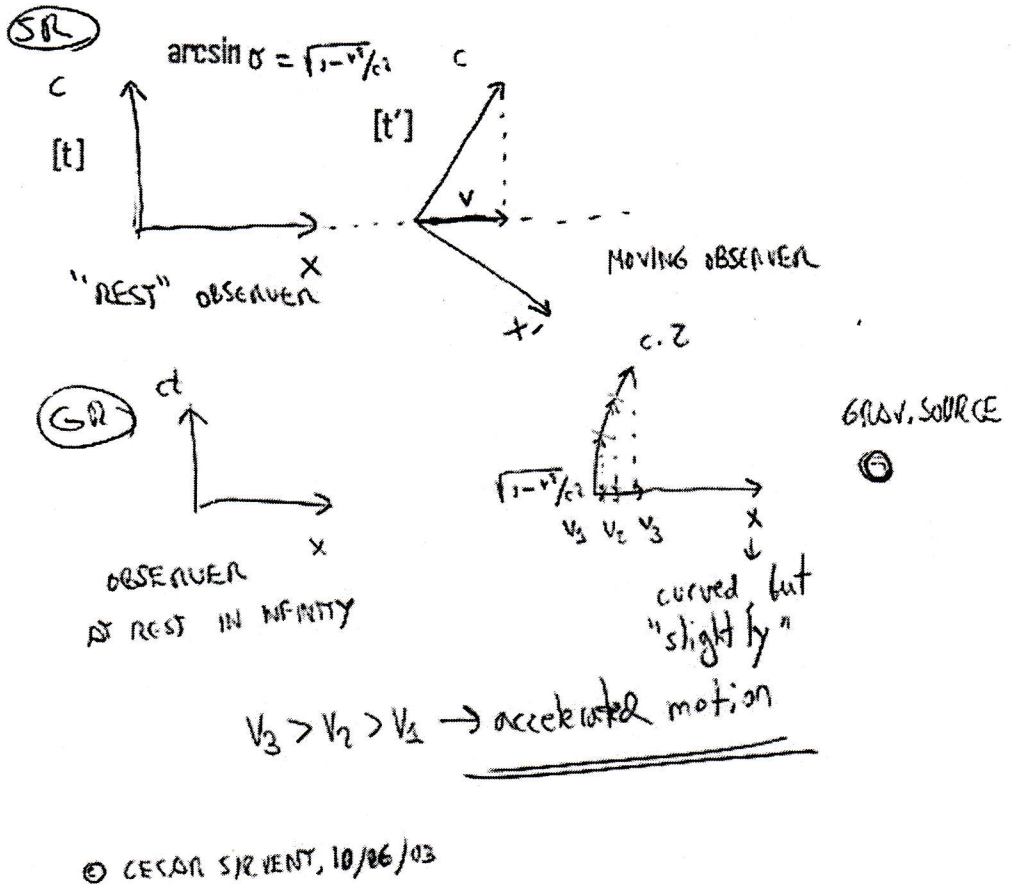
If V_4 (4-th speed) is c, then $V_4' = c \cdot \sin\theta = c \cdot \sqrt{1 - V^2/c^2}$

(proper time dilatation)

Length contraction:

$L' = L \cdot \cos\left(\frac{\pi}{2} - \theta\right) = L \sin\theta = L \cdot \sqrt{1 - V^2/c^2}$

Second diagram:



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