A configuration which breaks the Lorentz Invariance

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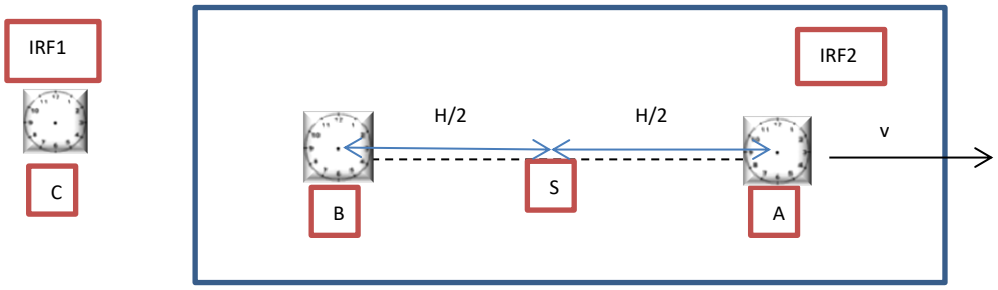
BREAKING THE LORENTZ INVARIANCE

By Stefano Quattrini 18/03/2018

1) Clocks A, B are separated by a distance H, at rest with the clock C in IRF1 (inertial reference frame) and S is a device set at a distance of H/2 from both A, B.

2) A,B are set in sync with t_A=0 and t_B=0.

3) A and B are co-accelerated at speed v, S co-move with them. A stop signal departs from S as soon as the system reaches speed v and are in IRF2.



4) Clocks A and B are stopped in IRF2, provided that the stop signal, is given enough time to arrive at both clocks after the pulse. It is T>= **γ** H/2c= T_{min}, the minimum time required to stop the clocks.

5) Lorentz Transformations predicts that $t_A - t_B = \gamma vH/c^2$ (1) , with $\gamma=1/\sqrt{(1-v^2/c^2)}$: the clock B looks being slowed down. The result is due to the "relativity of simultaneity", as illustrated also by Boughn (1989) "The case of the identically accelerated twins" Am. J. Phys. 57.

The following configuration replaces the point 3)

6) A pulse let A and B reach the speed v in a negligible time *t_{acc}. The minimum time counted by t_A before being stopped in IRF2 is just the sync time T_{min} , hence $t_A = \gamma H/2c$.

7) By trivial substitution in (1) the rear clock reads $t_B = \gamma H/2c - \gamma vH/c^2$ when both clocks are stopped.
8) The equation $H/2c - vH/c^2 = 0$ is solved by v=c/2, hence if v=< c/2, t_B >0

9) if v>c/2 t_B <0.

*The configuration is physically realizable, since t_{acc} can be finite (but still t_B <0), by assuming that the speed c/2<v<c.

CONCLUSION: in order to avoid the negative values of the time of the clocks, which is absurd, it has to be **$\gamma vH/c^2=0$**, hence **$t_A - t_B = 0$**, unless modifying "ad hoc" the LT, at least in the above configuration. Hence the Lorentz Invariance is broken at least in the configuration proposed.