time dilation terminology

The Urth list — 2 messages, 2 voices, 03 Dec 2002

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Michael Andre-Driussi — 03 Dec 2002, 00:30

> Blattid wrote:
> Um, no, Mantis ... in a world that obeys Einstein's rules, "time" is equally [ob|sub]jective in any inertial reference frame; more specifically, "time" on the Whorl cruising at NAFAL velocities is no more and no less objective than "time" on the surface of Urth. This is a consequence of "time" not being an independent entity in such a world; it is one dimension of a four-or-more-dimensional manifold which we (more) properly refer to as "spacetime."
>
> The "objective time"/"subjective time" terminology you use comes, not from relativistic physics, but from SF writers who play with these concepts in their novels but either do not comprehend what I oversimplify in the previous paragraph, or else assume (and I think this quite likely) that most "users" of NAFAL ships would think this way, the non-absolute nature of spacetime in an Einsteinian universe being kind of difficult to wrap one's head around. (I do not claim to have my head all the way around it by any means!)

Unless you are trying to tell me that there is no time dilation at relativistic speeds, which would be an interesting claim, then this looks to be another flea circumcising exercise on the terms Objective and Subjective. Worthy of litcrit, and literary theory, and philosophy (where these terms are Big Terms indeed).

As I was using it,

"Objective time" = t(o) = "interval of time experienced by an observer in the coordinate system (at rest)"

"Subjective time" = t = "time recorded by a clock moving in the rocket at a constant velocity V across space"

c = "velocity of light in a vacuum"

t = t(o)/Square root(1-(V^2/c^2))

Would you prefer I use "t" and "t(o)" instead of Subjective and Objective? I mean, criminy, you make it sound like I'm selling the Dean Drive here! Gimme a break!

=mantis=

Dan'l Danehy-Oakes — 03 Dec 2002, 00:39 · follows Michael Andre-Driussi

> Mantis wrote:
> Unless you are trying to tell me that there is no time dilation at relativistic speeds, which would be an interesting claim,

It would, but I'm not. The question then becomes whose speed is relative ... when you say that

> "Objective time" = t(o) = "interval of time experienced by an observer in the coordinate system (at rest)"

which coordinate system are you saying is "at rest?" At rest relative to what? Are you invoking luminiferous aether? Without that, the coordinate system of the _Whorl_ -- except during the boost phases -- is as legitimately "at rest" as that of Urth; or, taking your other (verbal) reference frame,

> "Subjective time" = t = "time recorded by a clock moving in the rocket at a constant velocity V across space"

there's no "space" for it to be moving "at a constant velocity across" -- once boost stops, it's moving along its natural worldline away, which happens to be at a more or less constant velocity relative to the Urth system ... but it's quite as legitimate (though generally less convenient) to declare that Urth is moving away from the _Whorl_.