Re: I don't get it

Source: http://sci.tech−archive.net/Archive/sci.physics.relativity/2008−02/msg01934.html

- *From*: "kenseto" <kenseto@xxxxxxxxxx>
- *Date*: Sat, 23 Feb 2008 08:47:57 −0500

"Daryl McCullough" <stevendaryl3016@xxxxxxxxx> wrote in message
news:fpnclr0j1d@xxxxxxxxxxxxxxxxx

> kk says...
>
> > On Feb 22, 12:39=A0pm, stevendaryl3...@xxxxxxxxx (Daryl McCullough)
> > wrote:
> >
> > > kk says...
> > >
> > > > You are, however, perfectly correct in
> > > > saying that acceleration
> > > > has nothing to do with it, but the question
> > > > you now have to ask
> > > > yourself is Why does merely being in
> > > > different frames cause one
> > > > to age differently?
> > >
> > > It doesn't.
> > >
> > > Let's consider an analogy using good old Euclidean
> > > geometry.
> > > One driver hops in his car and travels straight from Lincoln,
> > > Nebraska to Cheyenne Wyoming. His odometer −−−−−
>
> −snip−
>
> > In the same way, an accelerated path through
> > spacetime has a different proper time than an
> > inertial path connecting the same two points.
>
> Please, Daryl, we have already eliminated all accelerations.

> There is no sense in which twins in different inertial frames
> age differently in SR. The only "differential aging"
> in SR is the difference in ages between an inertial
> clock and a noninertial clock.
>
> > Also, odometers are NOT like clocks; your analogy is flawed.
>
> The point is that an odometer is a measures length
> of a spatial path, while a clock measures length of
> a spacetime path.
>
> > An odometer is linked to tires rubbing the road, whereas
> > a clock moving through space does not rub on anything
> > except space.
>
> The analogy is only to address the issue of whether
> acceleration causes a clock to tick at a different
> rate. It doesn't, any more than turning causes an
> odometer to advance faster.
>
> > Also, clocks moving along straight lines
> > at steady speeds can still "age" (run) differently,
>
> No, they cannot.

Yes they can. Every SR observer claims that the observed clock ages at a slower rate by a factor of 1/gamma.

Ken Seto

> > Also, even though there is − as you said − nothing wrong
> > with the odometers, there is certainly something "wrong"
> > with triplets who age completely differently even though
> > they have not accelerated but have merely been in different
> > inertial frames.
>
> The corresponding "triplet paradox" for cars is this:
> One car travels straight from Lincoln to Pierre. A second
> car travels straight from Pierre to Cheyenne. A third
> car travels straight from Lincoln to Cheyenne. You

add up the odometer readings of the first two, and
you get a different answer from the odometer reading
of the third. That's exactly like the triplet version
of the twin paradox.

> By "wrong," I mean simply that one may be
> old and wrinkled whereas his brother may still be young.

What's wrong with that? The two twins start at some
spacetime point A, and end at a different spacetime
point B. One twin takes longer (as measured in proper
time) to get from A to B than another twin. Why is that
surprising? The time required to get from Lincoln to
Cheyenne depends on the path taken, so why shouldn't
the time to get from spacetime point A to spacetime
point B depend on the path>?

> This is a physical difference between two people, and, as
> anyone can see, is not analogous to the identical odometers.

It certainly is. Aging is exactly analogous to the advancing
of the odometer.

> After eliminating all accelerations, we are left with
> nothing but plain inertial motion, so the question still
> stands: What could cause people in different frames to
> age differently?

They don't.

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Daryl McCullough
Ithaca, NY

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