Re: SR cannot determine Contraction

Source: http://sci.tech−archive.net/Archive/sci.physics.relativity/2008−02/msg02756.html

- *From*: Dono <sa_ge@xxxxxxxxxxx>

- *Date*: Fri, 29 Feb 2008 09:40:31 −0800 (PST)

On Feb 29, 8:38 am, Tom Roberts <tjroberts...@xxxxxxxxxxxxx> wrote:

> Dono wrote:
>
> > On Feb 26, 8:06 pm, Tom Roberts <tjroberts...@xxxxxxxxxxxxx> wrote:
> >
> > > Dono wrote:
> > >
> > > > In other words, do you , Tom Roberts,
> > > > believe that uniform relative
> > > > motion makes objects shorter?
> > >
> > > That's your confusion. This is phrased so poorly that no
> > > answer is
> > > possible. Your phrase "makes objects shorter" implies a
> > > change to the
> > > object, but observations made from another frame cannot
> > > possibly affect
> > > the object itself.
> >
> > Correct. But this is exactly what the paradox states, that , from the
> > barn frame, the pole becomes magically shorter, by virtue of relative
> > motion.
>
> You insist on using loaded words. This is not "magic", this is
> GEOMETRICAL PROJECTION. When you approach a doorway with a ladder, in
> some orientations the ladder fits through, and in other orientations it
> doesn't. THIS IS THE SAME PHENOMENON, but it occurs in the X−T plane,
> not the X−Y plane like the ladder's rotation. Relative velocity is a
> (hyperbolic) ROTATION in the X−T plane.
>
> Actually the analogy would be better if one considered
> moving the doorway around the ladder, leaving the ladder
> fixed. But common experience does not include either
> moving doorways or poles moving at 0.8 c.

> All this, while the contraction is "stressless".

> Of course there is no stress −− what stress is induced in the ladder
> when you rotate it? Or rather, when you look at it from another angle?

Then you are stuck with answering the following:

Would you care to show how?

−while in the proper frame S_0 : \ Sigma (F_internal) = 0

−in a frame moving with v wrt S_0 \Sigma (F'_internal)=0 (where F'_i
is the Lorentz transformation of F_i) and that , somehow, magically,
the atom sizes or the lattice spaces between atoms have Lorentz
contracted. I think Lorentz spent a good
10 years of his life trying to prove that and it amounted to nothing.

I know that you can calculate very well, so , I'd appreciate some
math

> To make
> things even more interesting, if the measurement methodology is
> switched to marking the pole endpoints simultaneously in the pole
> frame, this results into length dilation.

> That's completely irrelevant −− no measurement does that. To measure the
> length of a moving object you CLEARLY must mark its endpoint
> simultaneously IN YOUR FRAME. No other approach can possibly be said to
> measure its length IN YOUR FRAME.

You are missing the point (perhaps intentionally), I was showing you
that the notion of contraction is tied with the measurement
methodology, so, it is not INTRINSIC to the relative motion as YOU
claim.

> The whole point is the
> interpretation of length contraction: real vs. imaginary. You seem to
> believe it is real, Michael Janssen points the other way.

> Stop using such loaded and ambiguous words −− they merely confuse you and your reader: "real" means many different things to many different people. Discuss MEASUREMENTS, not what someone happens to think is "real". There is no doubt that MEASURING the length of a moving pole will obtain a value smaller than its proper length. And if your measurement includes rapidly opening and closing doors, the pole can fit inside a barn that is shorter than the pole's proper length. <shrug>

All right , let's make it even less ambigous, look here:

http://en.wikipedia.org/wiki/Length_contraction#A_trigonometric_effect.3F

What in the Roberto Torretti statement " Relative motion will not make a solid body shorter in the way that, say, heat makes it larger." don't you understand, Tom?

What in the paper by Redzic don't you understand, Tom?

I know that these references are kind of new but you need to keep up.

> > Uniform motion makes objects be measured to be shorter than when they are at rest.

> > Correction:
> > Depending_on_the_measurement_technique_uniform_motion_MAY_return_shorter_or-_LONGER_l
> > the _measured_object.

> No. The "technique" you mentioned does not measure the length of a moving object.

The technique I mentioned shows that "length contraction" is not an INTRINSIC property, it depends on the choice in simultaneity.

> > The "model" predicts shorter, which is correct. But you don't know if the object becomes shorter because there is no experimental confirmation.

> Again, stop using loaded and ambiguous words −− "becomes" has the same

ambiguity as "real". What SR unambiguously predicts is that a MEASUREMENT of the length of a moving pole will give an answer shorter than the pole's proper length. Yes, at present there is no direct experimental confirmation of this prediction, but given all the other confirmations of SR predictions, it would be perverse to deny this one.

But this is not (and has not been) the point of the discussion. The point of the discussion has been whether or not the barn doors will clip the rod.

> In order to become shorter you's have to ascribe to the theory that the "atoms_are_becoming_shorter" or that "the_interatomic_spaces_are_becoming_shorter". All this without any increased internal stress.

Again, stop using such loaded words. All that is happening is that the "stationary" observer is LOOKING AT the moving pole differently from a co−moving observer. OF COURSE this induces no stress in the pole, OF COURSE the pole can look different, OF COURSE the effect on the atoms is the same as on the pole, OF COURSE the effect on interatomic spaces is the same as on the pole. Because this is simply geometric projection, not anything more complicated (and not anything simpler).

> No one has seen it in practice. Because it comes with the "stressless contraction", a phenomenon never observed and never explained theoretically.

Nonsense. Looking at an object cannot possibly produce stresses in the object. This is COMPLETELY explained theoretically.

> Remember how the length of a moving object is measured: its front and rear locations are marked SIMULTANEOUSLY in the measuring frame,

> Yes, I know that very well. Problem is, if you mark the ends of the object in the object's frame you get length...dilation.

That is not any common type of measurement, and it does NOT measure the length of a moving object.

> Kind of
> disturbing, wouldn't you agree?

Only about your personal mental state. This is YOUR problem, not any problem with SR, or with anybody else.

> See my description of the gedanken without
> accelerations, and my solution to the problem you posed.

> Yes, I saw it. What if the effect is not the "physical" contraction?

What if your aunt had wheels −− would she be a teacart?

You use loaded words like "real" and "physical", without specifying PRECISELY what you mean by them. Discuss MEASUREMENTS, not such loaded words. Then everything works out and the ambiguities and confusions disappear.

> We agree on this. The problem still stands: is length contraction a
> physical or a geometric effect?

It is most definitely a geometric effect. But geometric effects can affect physical results. The ladder fits through the doorway only in some orientations, because the GEOMETRIC PROJECTION of the ladder's length onto the plane of the doorway differs. The length of a pole is measured to be shorter in a frame relative to which the pole is moving because the GEOMETRIC PROJECTION of the pole's endpoints onto the frame is different.

> You seem to believe that it can
> magically shrink the 50 foot pole to fit inside the 30 foot barn

There's no "magic", just simple, basic, GEOMETRICAL PROJECTION.

> The measurement of the length of moving objects is nothing more than
> an exercise in projective geometry. Depending how you do the
> projections, you get a DIFFERENT result.

Right. But there's only ONE WAY to project the length of a pole onto a frame −− mark its endpoints simultaneously in that frame. That method makes it be measured to be shorter in a frame relative to which it is moving, than in a frame relative to which it is at rest. <shrug>

Tom Roberts

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