Re: time dilation

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* *From*: PD <TheDraperFamily@xxxxxxxxx>
* *Date*: Fri, 18 Apr 2008 15:03:43 −0700 (PDT)

On Apr 18, 3:01 pm, rbwinn <rbwi...@xxxxxxxx> wrote:

> On Apr 18, 5:55ýam, PD <TheDraperFam...@xxxxxxxxx> wrote:
>
>> On Apr 17, 7:54ýpm, rbwinn <rbwi...@xxxxxxxx> wrote:
>>
>>> I thought you scientists said Galileo was wrong about relativity.
>>
>> No, he was right about relativity. It's just that the Galilean transformation that was thought to follow from the principle of relativity was wrong. The principle is right, but they didn't have all the laws of physics in place. This is where Einstein stepped in. He said two things to start: The principle of relativity −− as Galileo had it −− works and it applies to all laws of physics; second, since this applies also to the laws of electrodynamics, the speed of light in vacuum is a constant regardless of motion of source relative to observer.
>>
>>> ýThe
>>> principle of equivalence means that When Galileo dropped
>>> two different
>>> sized lead weights from the ýtop of the leaning tower of Pisa,
>>> they
>>> both hit the ground at the same time.
>>
>> Uh, no, that's not the principle of equivalence, either. Nor is it the principle of relativity. Where are you reading this tripe?
>
> In an old physics book. OK, let's go back to the beginning of this.
> Aristotle said that two objects of different weights dropped at the

same time will hit the ground at different times. The heavier one will hit first. So are you saying Aristotle was right?

No, I'm not saying that. The two do hit at the same time. This, however, has nothing to do with either the principle of relativity or the principle of equivalence. The fact that an object experiences a buoyant force equal to the weight of the fluid displaced is also true, but also has nothing to do with the principle of equivalence or the principle of relativity.

ýAs it was used by Isaac Newton,

two satellites of different masses in orbit around the earth at the
same altitude have the same speed.

Same problem.

Well, yes, it is the same problem. Newton calculated that the moon was falling toward earth at a rate that exactly cancelled the centripetal force of its velocity.

No he didn't. Again, where did you read this?
A rate of fall doesn't cancel a force, any more than a quart can cancel a hour.

He came to this conclusion when he
saw an apple fall to the earth from an apple tree while he was trying to calculate the orbit of the moon. So if you put an apple in orbit around the earth at the altitude of the moon, it would be falling toward the earth at a rate that exactly cancels the centripetal force of its velocity. What are you saying, that the moon and the apple would be traveling at different speeds relative to the earth?

No, I'm not saying that either. But this fact has nothing to do with the principle of relativity or the principle of equivalence.

ýMy equations agree with the
principle of equivalence.

> > > No, they don't. They make the laws of
> > > physics violate the principle of
> > > relativity, which is what the principle of
> > > relativity is all about.
> > > Under your equations that describe a
> > > possible transformation between
> > > coordinates between reference frames, the
> > > laws of physics and in
> > > particular the laws of electrodynamics are no
> > > longer of the same form
> > > in both reference frames.

> > ýI do not care about the laws of electrodynamics. ýI was talking about
> > light.

> Exactly. Light IS electrodynamics.

So scientists say. But if electrodynamics are exactly described by the Lorentz equations,

But it's not described by the Lorentz equations. It's described by Maxwell's equations. Maxwell's equations are the laws that govern both electrodynamics and light. The Lorentz equations are the transformations between reference frames that permit Maxwell's equations to respect the principle of relativity, which the principle of relativity insists that they should. But the Lorentz equations are not unique to light −− they are true for *all* laws of physics, which again the principle of relativity insists should be true for all laws.

then light is not electrodynamics, because
light will show my equations true and the Lorentz equations slightly false as far as the transmission of light is concerned.

Maxwell's equations have been tested to extraordinary high precision in experiment. They are demonstrated to be right and the Heaviside equations (which are the ones that would be correct if your transformation equations were correct) have been demonstrated to be wrong −− by measurement.

But as a matter of fact you have not shown me that even the
laws of
electrodynamics are changed in the equations I use.

That's true. It's easy to look up in Google the pages where someone
has carefully crafted that demonstration using HTML formatting to show
the algebra. A text−only venue is not a good place to do
that.http://everything2.com/e2node/Galilean%2520transformationhttp://every......
If I can find this in 8 seconds, I'm sure you can do better in 60.

Well, just say what you find is violated in this demonstration.

ýThat is explicitly a violation of the

principle of relativity.

I would strongly doubt that the equations I use violate
anything.

It doesn't seem to matter much what you doubt if you haven't educated
yourself on a subject. People can doubt evolution all they want, too.

We were discussing transmission of light. Scientists always want to
change the subject.

It also doesn't matter if you doubt how the transmission of light
works.

ýAs
I understand what the laws of electrodynamics say, a cesium
clock in
S' will show the speed of light to be c, which is what

n'=t(1−v/c)
says.

More to it than that.

No doubt, but you have yet to show what is violated. If

(x−vt)/t(1−vc)= x'Lorentz/t'Lorentz

then it seems highly unlikely to me that any of the laws of electrodynamics are violated, but if you can point out a specific one, it would be helpful.

I've pointed. You're sitting there with your mouth open, waiting for the rubber−coated spoon. This will not inspire much additional action other than what I've provided.

Of course, you'd never know that by looking at just the set of
equations you're considering. That's part of the problem.

Well, I do not see a problem. ýYou scientists claim to be all confused
by t'=t because it does not represent scientific time in S'. ýA cesium
clock in S' is shown by n'=t(v/c). ýScientists are horrified.. ýHow
does that violate any principles of science? ýScientists were horrified when Galileo said the earth was rotating on its axis.

ýNow since you claim to have found a mistake
in my mathematics, just go ahead and show everyone
the mistake.

> > > No, I didn't say there was a mistake in the mathematics. That's the point. There can be a perfectly well−formed and mathematically consistent set of equations that nevertheless does not match reality.. The determination of reality is NOT based on inspection of equations to find out if there is a math error somewhere. The determination of reality is based on whether, when you put actual *measured* values in for the variables in the equation, the left−hand side of the equation agrees with the right−hand side of the equation.

> > Well, OK, so what are the measured values that the equations do not agree with? ýI know about the measured values for the planet Mercury.

> Which has nothing to do with the Lorentz transformation or the Galilean transformation.

What you seem to be saying is that

(x−vt)/t(1−v/c) = x'Lorentz/t'Lorentz

somehow violates the principles of electrodynamics. If you could point to something more specific, I could answer your objection more completely.

Here's where you can exert a little effort on your part. Let me reiterate that I have no compulsion to convince you of anything. All I like to do is to point out where you're going wrong and to suggest where you can look to find what's correct. But it won't come on a spoon. If all you are willing to do is to swallow what's dropped into your open mouth, then I have no problems with you continuing to be wrong.

> > > My equations seem to match those measured values
> > > perfectly. ýMy
> > > equations seem to match the results of the
> > > Michelcson−Morley
> > > experiment perfectly. ýSo what is your objection?

> > Umm, if those are the only two experiments you're matching to, then
> > this illustrates the problem.
> > Look, Bobby, you're only passing time and you really haven't invested
> > any effort into this beyond the minimal hobbyist level required to
> > just pass the time. It just doesn't seem right that you would sit
> > lazily in your recliner and have people feed you information like
> > grapes while you are fanned and entertained. I'm willing to point you
> > to places where you can get educated on this stuff. I'm just not all
> > that inclined to go fetch it for you and drop it into your open mouth
> > on a rubber−coated spoon. You know what I mean?

> I know exactly what you mean. You are a scientist, and no one has the
> right to challenge what a scientist says.

Sure you have a right to challenge. My response to your challenge does
not necessarily entail my convincing you of what's right, with me
doing all the work. All I'm willing to do is point in the right
direction and to give you an idea of where you're going wrong. If you
do not want to do any work, this does not mean that your challenge is
unanswered; it just means that you're too lazy to investigate what the
answer is.

> You were the one who said
> that this equation
>
> (x−vt)/t(1−v/c)= x'Lorentz/t'Lorentz
>
> violates the laws of electrodynamics. I do not see how it could. So
> I asked you to provide an example. I am not going to go try to make
> up an example. I do not think one exists.

I know you don't think so. But you're also too lazy, it appears, to go
look. You might also not believe that a mammal that lays eggs does not
exist. This does not constitute a challenge sufficient for someone to
ship you an echidna.

You have made vague statements about electrodynamics.
ýHow exactly do
you claim the equations violate laws of electrodynamics?

I told you. It makes them lose their invariance with reference frame, which is precisely what the principle of relativity says should never happen.

Well, then it would be up to you to explain how the laws of electrodynamics lose their invariance with reference frame if my equations are applied.

Actually, no, it's not up to me. I've pointed. Now it's time to get off your ass and start looking for yourself.

I do not think it happens.

In your case, you wrote t=t'. This equation
doesn't describe reality
because when you put *measured* values of
t and t' in, as taken from a
real experiment, you find that the left side
and right side don't
agree.

Well, that is just ridiculous. ýJust try this experiment. ýTake
a
clock and put it on the floor next to you. ýIf you are in frame
of
reference S, then the time on that clock on the floor
represents
t'=t. ýThere, that was not so difficult, was it?

Sorry, that's one reference frame, not two. You have t, but there is no S' nor a t' measured in that other frame in your example, is there?

Look at the equations.

$$x'=x-vt$$

y'=y
z'=z
t'=t

x' is a coordinate on the x' axis of S'. y' is a coordinate on the y' axis of S'. z' is a coordinate on the z' axis of S'. What do you think t' is going to be? t' is time as it relates to x',y' and z' in S'.

That's correct. And x, y, z, and t are coordinates in S. The x, y, z coordinates in S are measured with rulers at rest in S, and the t coordinate in S is measured with a clock at rest in S. The x', y', z' coordinates in S' are measured with rulers at rest in S', and the t' coordinate in S' is measured with a clock at rest in S'.

You have one clock so far. That is either a clock at rest in S or a clock at rest in S', but it can't be both. Therefore it cannot measure both t and t'. With one clock, you are either measuring t or you are measuring t'.

The Galilean transformation tells you what you can expect to be the relationship between the t measurement on the clock at rest in S and the t' measurement on the clock at rest in S'. (It predicts that they will be the same.) The Lorentz transformation tells you the same thing, but it has a different prediction for what that relationship will be. In comparison with actual measurements with actual clocks, the prediction of the Galilean transformation turns out to be wrong, and the prediction of the Lorentz transformation turns out to be right.

Now notice what the equations say t' is. t'=t.

Now try this experiment. You have a clock sitting on the floor that represents t'=t. Can another clock be made to run faster or slower than the clock sitting on the floor?
By experiment we can determine that a clock can be made to run at any speed.
Now scientists have determined that there is another cesium clock in S' that is running at a rate such that it shows the speed of light to be 300,000 km/sec in S'. This clock in S' is running slower than the t'=t clock. We cannot call the time on the clock in S' by the variable t' because that variable is already used in the Galilean transformation equations. So we call the time on the cesium clock in S' by the variable n'. Scientists are horrified. You have violated the laws of electrodynamics, they say. OK, scientists, show how the laws of electrodynamics were violated by doing this.

You DO know what a reference frame is, don't you?

A whole lot better than Eric Gisse does. He asked me what S' was
doing relative to S after I posted the Galilean transformation
equations.

ý ý Now you have some equations in which t' is said to
represent time
on a cesium clock in S', a moving frame of reference. ýTry to
grasp
this concept. ýWe already said that t' was the time on the
clock on
the floor. ýSo t' cannot be used again to represent time on a
cesium
clock in S'. ýWe use a different variable for that time,
n'=t(1−v/c).
ý ý But, you say, no scientist will ever agree to use any
variable
except t' for time on a cesium clock in S'. ýOK, but that does
not
prove anything to me except that you do not understand
elementary
algebra. ýIf you cannot understand that n' is being used to
represent
time on a cesuim clock in S' and use it accordingly, then so
be it,
but it does not show me any violation of any law of
electrodynamics.
It shows me that science is a dogmatic discipline like radical
Islamic
belief, so why worry about science?
ý ý Let scientists decide for themselves what they want to
believe.

ýThis does NOT mean that there is a mathematical mistake
in the

derivation of the equations someplace. It just
doesn't describe
reality.

Well, it is easy to say that a set of equations does not
represent
reality. ýWhat is lacking is any sort of proof of this
statement.

> But there IS proof. There is lots of experimental literature. It is freely available, provided EXPLICITLY so that people who are interested can look it up and discern for themselves that it's been proven. Moreover, it's written in such a way that if you wanted to reproduce the experiment, the instructions for doing so are there in the same publications, and then you could see with your own eyes that, in fact, nature works this way. The one thing this scheme does not provide is a handmaiden to carry the information to you and hold it up in front of your eyes.

I have already seen the information. What is lacking is one instance where it can be shown that calling the time on a cesium clock in S' by the variable n' instead of t' violates the laws of electrodynamics.
As I said before, you scientists are as dogmatic about this as Islamic jihadists are about cutting the heads off of infidels.

> > > The development of physics is littered with theories (since abandoned)
> > > that are completely logical, completely mathematically consistent, and
> > > completely plausible -- and dead wrong. And the fact that they are
> > > wrong is determined when confronted with *measured* values in
> > > experiment.

> > Right, so show the "measured values" that prove the equations I am
> > using are wrong.

Robert B. Winn

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