

Re: time dilation

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- *From:* rbwinn <rbwinn3@xxxxxxxx>
 - *Date:* Fri, 11 Apr 2008 08:32:05 -0700 (PDT)
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On Apr 11, 8:04 am, Darwin123 <drosen0...@xxxxxxxx> wrote:

On Apr 11, 1:09 am, rbwinn <rbwi...@xxxxxxxx> wrote:

On Apr 10, 9:07 pm, The TimeLord <math-n-physics-...@xxxxxxx> wrote:

Am Thu, 10 Apr 2008 20:20:21 -0700 schrieb rbwinn
<rbwi...@xxxxxxxx> in
13c68862-4b53-4292-b31a-2651f9110...@xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx:

On Apr 10, 7:45pm,
mitchg...@xxxxxxxxxxxx wrote:

On Apr 10, 5:39pm,
Darwin123
<drosen0...@xxxxxxxx>
wrote:

On Apr 10,
7:40 pm,
rbwinn
<rbwi...@xxxxxxxx>
wrote:

[...]

Motion time is Gamma and
there is gravitational time
slowing the
metric.

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Mitch Raemsch Twice
Nobel Laureate 2008– Hide
quoted text –

Well, I should have known. So what does
slowing the metric do? Robert
B. Winn

A metric can not slow any more than an addition can
accelerate. Mitch
Raemsch simply doesn't know anything. Sometimes I
wonder if he even reads
what he is responding to. The question was about an inertial
train and
Mitch Raemsch throws in time dilation due to gravity. What
a moron!

To be honest it looks to me as though you scientists use the Lorentz
equations to adjust equations to fit whatever experiment shows to be
happening.

Not true. The Lorentz equations are used make predictions, and
then the experimental results match those predictions. The problem is
that you are using the Lorentz equation wrong. However, you haven't
described your thought process clearly enough that anyone can see
where you made the mistake. I can explain how I would do the problem,
but I can't be sure how you did the problem.> So far you do not seem to be addressing the
problem I

see. If the object hits the floor of the train car at the same time a
clock in S ticks, then the equation for t' shows that the Lorentz
equation t' clock ticks after the object hits the floor.

This is wrong. I can address the problem no clearer. If released
from the ceiling of the train, it does not tick after it hits the
floor. What everyone is trying to explain to you is why this is wrong.
They are addressing the problem. The problem is trying to figure out
why you think otherwise. You are asserting a false statement, and no
one can figure out why you are so sure of that false statement.

Are you assuming that the observer is a large distance away? If x
is very large, then t' is negative. Are you assuming that the

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acceleration is the same in both frame? The acceleration of gravity in S is smaller than the acceleration of gravity in S'. Maybe that's it.

What it looks like to me is that you think the acceleration is the same in the two frames. The acceleration is not the same in the two frames. The Lorentz transformation applies to the space and time coordinates of every event. Since the acceleration is defined in terms of events, the acceleration has to be transformed to.

Maybe this is the problem. I assume that S is stationary with respect to the tracks. The object, although falling, is traveling with the train. It was dropped from the ceiling of the train, so the momentum carries it with the train. This is an S' clock. The observer in S is seeing the object move at nearly the same velocity as the train. Therefore, the observer in S sees the object fall slowly.

You have to state what the condition of the clock is when it was dropped. If it was initially attached to the ceiling of the train and then released, then its initial velocity is the same as the train. In fact, to a pretty good approximation the clock is at the same velocity of the train at all times. Therefore, the time dilation applies to the clock. This clock belongs to the S' observer.

Maybe your problem is this. According to SR, the acceleration of the clock is dependent of its velocity relative to the tracks. According to SR, the force of gravity is dependent on velocity. According to Newton, the acceleration is independent of the velocity relative to the tracks. The gravitational field is a little more complex in SR than it is in Principia. That is even before we get to GR.

You can cook up a problem where the clock was not attached to the ceiling when released, and was stationary in S. The details are not important. However, in this case the velocity of the clock is always close to zero. Then the rate of ticking won't change. The clock in this case belongs in S'.

Again, purists will say that I can't talk about gravitational forces in SR. Such a statement would be incorrect. Gravity is like any other force in SR. The gravitational field transforms according to the Lorentz transformation. Your problem may be that you aren't transforming the forces.

GR is more accurate when it comes to gravitational fields. However, GR is not necessary for this problem.– Hide quoted text –

– Show quoted text –

Darwin,

I like your idea of having the weight be a clock. I came to the same idea, but was just using the hitting of the floor as a tick. I like your idea better. Use a cesium clock as the object to be dropped.

Now we set up the experiment this way. Put an identical railroad car, or an apparatus that drops a clock the same distance in S. Then we hire a photographer to take pictures of the two clocks as they drop. Ok, the train comes by at a high rate of speed, and the

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two clocks are dropped at $t'=t=0$. Our photographer takes a bunch of pictures as the clocks drop, and the last picture shows the two clock hitting the floor at the same time. Say the train is going at the speed of the planet Mercury, 30 miles per second, then if the clock in S reads 1 sec when it hits the floor, the clock in S' will read .99984 sec when it hits the floor.

Now we put the photographer on the train and run the experiment again. This time the pictures show the two clocks hitting the floor at the same time, but the clock in S' reads 1 second, and the clock in S reads .99984 sec.

Do you agree with this result, and if so, does anything about it seem contradictory to you?

Robert B. Winn

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