Re: twin patadox question

Source: http://sci.tech−archive.net/Archive/sci.physics.relativity/2005−09/msg00100.html

- *From*: "PD" <TheDraperFamily@xxxxxxxxx>
- *Date*: 1 Sep 2005 11:28:23 −0700

TomGee wrote:
> PD wrote:
> > TomGee wrote:
> > > Harry wrote:
> > > > <slefkowit@xxxxxxx> wrote in message
> > > > news:1125333294.553585.309380@xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
> > > > > The usual explanation (as I understand it) as to why the twin paradox
> > > > > is not really a paradox is that one twin experiences acceleration and
> > > > > the other doesn't.
> > > >
> > > > − It's by definition really a paradox. Dictionary.com, paradox:
> > > > 1. A seemingly contradictory statement that may nonetheless be true.
> > > >
> > > > Thus, it doesn't matter if it is true or not to be called a paradox. And
> > > > what do you think *is* the twin paradox?
> > > >
> > > >
> > > Assuming I have the right to enter this conversation at this point and
> > > offer my opinion of what the TP is, I will.
> >
> > Assuming that I have the right to respond to your ragged entry into the
> > conversation, I will.
> >
> > >
> > > I think you all make the TP much more than what it is. It's a paradox,
> > > alright, but it is a paradox only because SR shows results which can
> > > only be described as a paradox. There it ends the experiment; it makes
> > > only one conclusion and that is that one twin aged more than the other.
> > > SR does not try to explain why that happened, it simply claims it does
> > > happen.
> >
> > Quite the contrary. I do recommend an excellent book on SR called
> > "Spacetime Physics" by Taylor and Wheeler, which explains in exquisite
> > detail the Twin "Paradox". It probably costs no more than Encarta in
> > terms of wallet, though it will cost a little more of your time.
> >
> > The twin paradox is only a paradox if one uses a naive understanding of
> > SR, namely the one that simply states "moving clocks run slow".

> >
> >
> That may be the way you undestand SR, but to me that is now and always
> has an incomplete statement. "Moving clocks" run slow only when
> compared to slower−moving clocks. That is the resolution of SR's TP.

That is still a naive statement and, furthermore, wrong.

> >
> >
> > A more
> > careful use of the principles of SR, starting with a more fundamental
> > understanding than what is afforded in the quoted sound−bite,
> > completely resolves the twin paradox, which is *exactly* why it is
> > often used as a teaching example to get students to move beyond the
> > sound−bite understanding of SR.
> >
> >
> "Sound bite"? Is that a scientific term?

No, it is unscientific, which is precisely my point. Time to get off a
sound−bit understanding, Tom.

> >
> > >
> > > >From there, everyone has argued every aspect of that claim and has
> > > tried to explain away the paradox. Myself included, in my model of the
> > > universe, which I have posted piecemeal in these sci.ngs for years now.
> > > I have even shown a different experiment which better explains the
> > > paradox, and I have endeavored to explain it away with my claim that
> > > time is a property of motion and that it passes for discrete objects in
> > > accordance with their states of motion.
> > >
> > > My conclusion takes the result of the TP and develops the conclusion
> > > that the time rate for one twin varies from the other during the trip
> > > because of their states of motion which changed during the experiment
> > > out and back because to go away from Earth and then to return to it
> > > requires that the spaceship go faster than the planet during the trip.
> >
> > Faster with respect to what?
> >
> >
> I SAID faster than the planet. What part of that did you
> miscomprehend?

Where the velocities of the earth and the spaceship are measured with
respect to what reference point? What part of that did you
miscomprehend?

> >
> >

> > You know that the tangential orbital speed
> > of the Earth around the Sun is about 67,000 mph, don't you? So if the
> > spaceship is returning to Earth, head−on in the same road that the
> > Earth is taking around the Sun, is it traveling faster or slower than
> > the Earth?

If that one's too hard, let's take a more bonehead case to see if it helps you grasp the above question.
Let's take a truck (a Czech model call the Urth) and have it rolling on a highway at 60 mph. Now, a motorcycle (also Czech, called the Spach Tzip) rolls off the front of the truck and heads down the highway at 90 mph in the same direction as the truck, so that it has a *relative* velocity of 30 mph with respect to the truck. At some point down the road, it turns around and heads back toward the truck so that it again has a relative velocity of 30 mph with respect to the truck, but now approaching the truck. Now, while the motorcycle is on its return trip, is it moving faster or slower than the truck?

Now note in this example that the relative velocity of the truck and the motorcycle is 30 mph always (part of the trip separating, part of the trip approaching), which is a context identical to the twin paradox.

> >
> > > >
> And what if it isn't returning in the orbit of the planet?

That's not the question. What if it IS returning in the orbit of the planet?

> If the
> astronnaut leaves the region encompassed by the Earth's orbit, it must
> speed up to return during the time when his twin is still alive, as the
> experiment dictates.

I see *nothing* in the gedanken experiment that says that the spaceship has to leave and return along a line that is not tangent to the orbit. Where did you make that up from? So, in your mind, the twin only returns younger if it heads away from the sun? Where does it say that?

> The ship can travel at the same speed as the
> Earth and return, but then the time difference will be much less as it
> will cover only the faster speed of the escape velocity. If it travels
> slower than the Earth to return back to it, it could be that the
> astonaut twin will be older than his twin instead, depending on how
> slow it moves getting back.

And this is counter to SR and counter to experiment. Nice job, Tom.

> >
> > > >

> > > > − "experience of acceleration" is indeed not the issue, and anyway
> > > > irrelevant for calculation for acceleration has no relativistic effect on
> > > > clock rate. See below.
> > > >
> > > >
> > > I agree, of course.
> > > >
> > > >
> > > > > Consider the following example:
> > > > > spaceship 1 is statinonary
> > > > >
> > > > > spaceship 2 accelerated to .99c before we began this experiment. It
> > > > > passes spaceship 1 and they synchronize their clocks at time 0. It
> > > > > travels 10 light years (as measured by spaceship 1).
> > > > >
> > > > > spaceship 3 has also accerated to .99c before we began the experiment
> > > > > and is travelling in the opposite direction from spaceship 2. At the 10
> > > > > light year mark (as measured by spaceship 1), '2' and '3' cross paths
> > > > > and '2' tells '3' what time it is. '3' continues on, passes '1' and
> > > > > reports the time at which it passed '2'. What time does '3' report to
> > > > > '1'?
> > > > >
> > > > > Time dilation (if I calculate correctly) would say '2' should have
> > > > > recorded about 1.4 years at the 10 light year mark. But without
> > > > > acceleration, '1' and '2' would appear to be in symmetric situations,
> > > > > so that '2' should also think about 10 years passed.
> > > > >
> > > > > What is the correct calculation?
> > > >
> > > > The correct calculation method you can find online by Einstein in 1905,
> > > > paragraph 4 :
> > > >
> > > > " If one of two synchronous clocks at A is moved in a closed curve with
> > > > constant velocity until it returns to A, the journey lasting t seconds, then
> > > > by the clock which has remained at rest the travelled clock on its arrival
> > > > at A will be 1/2tv^2/c^2 second slow. "
> > > > http://www.fourmilab.com/etexts/einstein/specrel/www/
> > > >
> > > >
> > > I would agree except with his statement of "constant velocity".
> > > Perhaps it meant something different then, but today it means "wrt to
> > > another object moving at the same speed and direction". If my claim is
> > > correct, moving B away from A at constant velocity in a closed curve
> > > will result in no time dilation between between the two clocks. The
> > > reason why is because the time rates of the twins upon separation
> > > remained the same throughout the trip.
> > >
> > > As I explained it, the astronaut twin has to have accelerated to escape
> > > velocity in order to leave the planet, and that of course means it has
> > > to increase its speed above that of the Earth's speed. Plus, in order
> > > to catch up with the planet again later, it has to have moved faster

> > > then as well.
> >
> > See above.
> >
> > > >
> > > >
> > > > BTW, that 1905 calculation of the two identical clocks (later twins) was the
> > > > first.
> > > > The correct way to calculate such problems was never an issue: you'll get
> > > > consistent results when you stick to a single inertial system of
> > > > coordinates. '1' and '2' didn't do so, thus '2' should have made a
> > > > correction because of "frame jumping".
> > > >
> > > >
> > > Let's say we have two inertial coordinate systems in one FoR and two
> > > others in an second FoR. They are separate FoRs so long as you keep
> > > one from including any space or objects from the other. Immediately
> > > upon mixing anything from one to the other, they are no longer separate
> > > FoR, but a single one. Thus, there can be no such thing as
> > > "frame−jumping", in my opinion, except in error, and so, that is not an
> > > issue in the TP.
> >
> > Your lack of understanding of what a FoR is, is profound and pervasive.
> >
> >
> Pot. Kettle. Black.
> >
> >
> > Consider a car that is rolling through an intersection with a stop
> > sign, with Bill driving the car and Betty leaning against the
> > stop−sign. (Betty is a hooker.)
> >
> >
> I hope your comprehension problems are not due to your being hard up.
> >
> >
> > There is a FoR that is moving along
> > with the car, in which the car and Bill are stationary and Betty and
> > the stop sign are moving.
> >
> >
> Bill is in a moving car and Betty and a stop sign are moving? That
> makes sense to you?

Absolutely. In Bill's frame of reference, the stop sign and Betty are
moving backwards.

You must be assuming that you can tell which one is moving and which
one is not. So tell me, which one of these is moving? (Before you
answer that, be sure you consider the reference point that you think is
absolutely at rest.)

> >
> >
> > There is a FoR that is moving along with the
> > stop sign, in which the stop sign and Betty are stationary and Bill and
> > the car are moving. Bill, Betty, the stop sign and the car are all
> > objects that exist in *both* FoRs.
> >
> >
> I thought I had taught you better than that, and I did, but your
> comprehension problem is obviously deeper than I thought. You are
> still confused about FoRs, but maybe this will help. You can have your
> two FoRs even if Bill is leaning out the window kissing Betty as she
> moves by. In fact, FoRs are imaginary and so you can make up any you
> wish. But you cannot use any you wish to use without making them into
> a single FoR!

Kiss, schmiss. Bill would have to pay extra to kiss.
There are a multitude of reference frames in which all four of these
objects live. There is a reference frame moving at 550 mph with respect
to the stop sign (in which a pilot overhead happens to be at rest), and
Bill and Betty and the stop sign and the car are all moving in that
one.

>
> If you have Bill leaning out kissing Betty, the two FoRs become one
> because you are using Bill to kiss Betty. Let's say Bill is moving in
> his car and as he passes Betty he sticks out his hand and slaps her in
> the face. As he approaches Betty, he and Betty can be in the same
> frame or in two different frames. At the point where his hand makes
> contact with her face, they are in the same frame of reference. As his
> hand leaves her face, you can say they are in two separate FoRs if you
> want to and for whatever reason. Understand?

You clearly have no understanding of what a frame of reference is. I
suggest you do some reading in Encarta on the subject. Failing that,
you can try this one:
http://en.wikipedia.org/wiki/Frame_of_reference

PD

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- ***Follow−Ups***:
  - ***Re: twin patadox question***
    - *From:* TomGee

- ***References***:
  - ***Re: twin patadox question***

        ◊ *From:* PD
    ♦ ***Re: twin patadox question***
        ◊ *From:* TomGee

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