

Re: Time Dilation reduces the Speed of moving Objects

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- *From:* Darwin123 <drosen0000@xxxxxxxxxx>
 - *Date:* Fri, 19 Sep 2008 19:43:48 -0700 (PDT)
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On Sep 19, 5:14 am, Peter Riedt <rie...@xxxxxxxxxx> wrote:

On Sep 19, 3:31 am, Darwin123 <drosen0...@xxxxxxxxxx> wrote:

Isn't this an internal contradiction? You assumed that the object was going at 200000 km/s. That was the number you plugged into the time dilation formula. If the speed changes to 14907 km/s, then you have to place that new speed into the time dilation formula. Then you get a new speed, and you have to plug the speed in again. This results in an infinite series.

The result is the spaceship goes at 0 km/s. It can never go at any other velocity. Every time it starts to move, you have to shrink the speed repeatedly until it is zero.

Funny! The way physicists use the Lorentz transformation is they plug the speed of the object into the time dilation formula only once. One justification is that recalculating the rate of ticks in a clock doesn't change the original speed of the space ship. that the measuring instrument in the spaceship are in one and only one reference frame.

If that is too abstract for you, go back to the approach used by H.A. Lorentz.

Assume that the spaceship contains a clock made entirely of electrically charged particles, that is somehow held together only by electromagnetic forces. Say the clock is made of protons and electrons, with no neutrons. The spaceship is moving at 200000 km/s. All the particles in the clock are moving at 200000 km/s, with a slight variation due to the mechanism of the clock. Moving electric charges generate an extra magnetic field as well as an altered electric field. The magnetic field and altered electric field slow down the mechanism of the clock.

A similar clock is moving at 0 km/s. It has no extra magnetic field or electric field due to motion. So the clock isn't slowed down by extra electric or extra magnetic fields. So the clock on earth ticks faster.

During the turn around of the space ship, there are extra

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electric and magnetic fields generated by the acceleration of the clock. These acceleration generated electric and magnetic fields result in a speed up of the space ship clock that more than makes up for the slow down caused by uniform motion. Sp when the spaceship clock gets back to earth, it is behind the earth clock.

Okay, the clocks have neutrons as well as protons and electrons.. If I wanted generality, I would have stuck with Einstein. Never the less, you see the point.

The electromagnetic forces would cause a slow up in the spaceship clock even if Einstein's relativity were not exactly true. Time dilation would exist, because all clocks have electrically charged particles. However, the time dilation wouldn't exactly be described by the Lorentz transformation. There is no way a rapidly moving clock containing electrically charged particles could avoid slowing down. Similarly, there is no way a ruler containing electrically charged particles could avoid being shorten. Every object in the universe contains electrically charged particles. Therefore, even without the invariance of the speed of light there would be a problem building a self consistent standard for measuring time and space.

Einstein provided an exact formula, the Lorentz transformation, that would apply at all relative velocities. Lorentz provided the equations, as it turned out. However, he never showed that these formulas were always true.

The way Lorentz formulated it, the equation for energy of a charged particle– Hide quoted text –

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Darwin,

very well put but it is not a contradiction; it is an impossibility. I should change the subject to "Time dilation reduces the speed of objects to zero". In respect of Lorentz's idea that contraction is caused by compression of electrical particles within the body due to motion or whatever, this has been discarded by SR experts.

These are not mutually exclusive possibilities. You are making a classical error in logic. You are excluding the middle.

They now

believe that contraction and time dilation are perceptions of an observer due to his speed relative to the observed object.

You are misrepresenting their point of view by twisting the word "perception." Look at the "twin paradox."

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When the twin comes back, he is younger. Therefore, the time dilation is "real" in one sense. It is not a "perception" in your meaning of the word. Something actually did happen to the twin in the turn around.

The time dilation is not real in the sense that the situation is symmetric until the spaceship rockets turn on and the twin goes home. Each twin sees the other twin age slower. Therefore, the time dilation is a "perception" because one can not resolve the question of which twin has actually "slowed up" in aging.

Lorentz himself couldn't decide from the experimental evidence which twin actually is experience a time dilation due to electromagnetic forces, or a length compression due to electromagnetic forces. Lorentz's equations are totally symmetric with regard to uniform motion. The results are exactly the same if the earth twin is in uniform motion, or the rocket is in uniform motion. The "reality" of the forces in each frame doesn't help resolve the ambiguity.

This situation is actually quite common in physics and engineering. Physicists call this a symmetry. In mathematics, it is called a uniqueness problem. Sometimes the math describing a physical situation has two different numerical solutions. However, very often there is no way to physically separate the two solutions. The results describe the exact same physical solution, although there is more than one numerical solution.

Before the turn around there is no actual way to resolve which twin is being "compressed" and which twin is being "slowed." In this way it is more like a "perception."

The semantics of the word "perception" is perhaps a little confusing. The way I a physicist would interpret the word "perception" as delivered by another physicist is the following. A "perception" looks like a unique solution but isn't. However, a "perception" can be very real. There are some real phenomenon in the world that have very important effects but are associated with an unavoidable ambiguity. The idea that there was no ambiguity, or that the ambiguity is somehow avoidable, is the real "perception."

The rotation of two observers is a perfectly good analogy. If two flounders look at each other edge on, they would each see a flat line. If one of them rotated, they would each see a fuller shape. The question of which is being stretched out is sort of stupid. The outline of the other flounder is a perception. Or is it real? You are mistaking the word "perception" as meaning "not real." However, the word "perception" is being used here to mean "ambiguous." Despite ranting and raving to the contrary, some ambiguity is physically real and unavoidable.

If two gunfighters (A and B) in a duel draw their guns at the same time and kill each other, then the "reality" of their actions is undeniable. If a witness says that A killed B, then that is the witness's "perception." You could as easily say that B killed A, which would be another "perception." In fact, when they drew their guns it took a millisecond for the bullets to reach their targets. If a detective tries to order the events in time, he would conclude that neither A or B killed each other. It was the bullets that killed A and

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B, since the drawing and firing of the guns wasn't really what killed A and B. This is another perception, and in a strict engineering sense this is also physically real. However, there is another witness who would say "those jerks had a stupid duel and killed each other."

I myself hate using the word "perception." It has a different meaning to laymen than physicists.

I know a fellow at work being bullied by some managers. When the manager was sued, the manager said that the bullying was only a perception. I was actually asked whether it was my "perception" that the fellow was bullied. Of course, the "truthful" answer any physicist should give is that it was a "perception." A perception in the dictionary is anything that is perceived. Since I perceive of this fellow being bullied, I said it was my "perception." However, it was real bullying. The use of the word perception as being "unreal" is lawyer-speak. That is not the way a physicist uses the word "perception."

The perception is that only one twin is being slowed down. The reality is that the phrase "slowed down" is meaningless until those rockets go off.

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