Re: Time Dilation reduces the Speed of moving Objects

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- *From*: PD <TheDraperFamily@xxxxxxxxx>
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On Sep 16, 8:36 pm, Peter Riedt <rie...@xxxxxxxxxxx> wrote:

> On Sep 17, 4:40 am, Darwin123 <drosen0...@xxxxxxxxx> wrote:
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> > On Sep 15, 10:37 pm, Peter Riedt <rie...@xxxxxxxxxxx> wrote:> Time Dilation reduces the Speed of moving Objects
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> > When Lorentz invented time dilation as part of his contraction
> > hypothesis he did so to allow the speed of light to remain constant.
> > He realized that if the length of a moving object contracted, its
> > time had to slow down or the speed of light would not be constant.
>
> That wasn't why he made up the Lorentz transform. The approach
> that you describe belongs to Einstein.> Lorentz however considered only the effect of time dilation on the
>
> speed of light, not the object.

You have it the wrong way around. He DID consider the motion of an electrically charged object. He considered the interaction between the electrically charged object and its own electric and magnetic fields. He discovered that the interaction inhibits the acceleration of the charged object in a way that suspiciously resembled inertial mass. The effective increase in mass caused by this inhibition was the Lorentz factor for mass.

Since the effective mass of the particles increases due to the motion of the particle, the acceleration of the particle decreases. An entire system made of such particles will also slow down. This, Lorentz proved also. If you make a clock out of electrically charged particles, the clock has to slow down with velocity.

Furthermore, the pressure on an electrically charged sphere will tend to flatten the sphere in a way consistent with the Lorentz length contraction formula. An entire system of charged particles will also do so. If you make a ruler out of electrically charged particles, the ruler has to contract with velocity.

Lorentz proved it using standard laws for electromagnetic theory and Newtons mechanics. However, his proofs were very specific to charged particles. One can use his formulas to explain the Michaelson Morley experiment, but only under the condition that each and every particle in the apparatus was electrically charged. Then one has to ask oneself what held the apparatus together. Systems with only electromagnetic forces are intrinsically unstable.

Einstein made that conceptual leap of treating the speed of light as an invariant. This generalized the Lorentz transformation to everything, including uncharged particles. So this explained experiments like the Michaelson Morley experiment among others.

In any case, I agree that Lorentz was a big time genius who deserves more space in the history books. However, you are blaming Lorentz for making the mistake of Einstein's greatest discovery. That's two consequetive errors. Neither Lorentz nor Einstein were wrong, and it was Einstein who looked at the speed of light. Looking at the speed of light is equivalent to considering particles that aren't electrically charged.

> This oversight renders time dilation invalid.

No way. Even if Einstein was wrong in his generalization, Lorentz would still be right if only for electrically charged particles. Time dilation would exist for clocks that were made of electrically charged particles, where no other force was involved. This would make it a marvelous approximation for certain applications. The Lorentz model would probably describe time dilation in atomic clocks. The Lorentz model wouldn't explain time dilation in mesons, because mesons decay by nonelectrical means.

So if muons didn't display time delay, but atomic clocks did, the I would say that Lorentz was right not Einstein. However, muons and atomic clocks both display time dilation. So I guess Einstein was right. However, so was Lorentz. The atomic clock displays time dilation.

Einstein turned the Lorentz model into a theory.> While it is legitimate to apply double standards in politics,

in physics it is not.

In politics, I want leaders who consistently follow one moral standard. They have to make compromises, because the world is a complex dynamic place. How many oil wells to dig versus windmills is not a big legitimacy issue. However, there are moral invariants. So it is not legitimate to wipe out hundreds of men, women and children just because the adults won't vote for you in an election.

The speed of light is an invariant. So I want clocks that take into account that difference. However, the physical invariant is the speed of light.

Lorentz should not have messed with the relationships v=d/t.

He didn't. Lorentz played with d and t separately, but didn't put them together.

It was Einstein who came up with the addition of velocity formula in SR. I am glad Einstein messed with it. Otherwise, much of the stuff we developed wouldn't have been developed.

Darwin,
a very nice answer. A small point however: why do we apply time dilation selectively to the speed of light, the twin paradox, clocks and everything else but not to the speed of the moving object(except muons)?

Peter Riedt

Time dilation applies to everything, including the car driving down the street or you walking to the store.
Now, whip out your calculator and find out how big an effect this is.
You may say, "But shouldn't we always use the exactly right calculation all the time?"
The answer is, "No, we should use the calculation that is most convenient and satisfies the precision needed for the purpose at the time."

PD
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