

Re: The real twin paradox.

Source: <http://sci.tech-archive.net/Archive/sci.physics.relativity/2007-11/msg01458.html>

- *From:* bz <bz+spr@xxxxxxxxxxxxxxxxxxxxxx>
 - *Date:* Thu, 22 Nov 2007 08:27:39 +0000 (UTC)
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"Sue..." <suzysewnshow@xxxxxxxxxxxx> wrote in
<news:7c3700d6-75df-4a6d-a7d2-ff1a5d44a7a8@xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx>:

On Nov 21, 8:33 pm, bz <bz+...@xxxxxxxxxxxxxxxxxxxxxx> wrote:
[...]

Oh, light clocks are not difficult to build.
You can take a fiber optic transceiver and a mirror and a bit of electronics.

Do a little optical impedance matching to free space and set up your mirror at a convenient distance.
Set the electronics so that every time a tick is received, a new tick is launched.
Press the little 'starter' button.
You have a light clock.

Any high school kid can build one.

The real trick is to build a 'normal clock' that ACTS like sue says a 'normal clock' should act.

Have you read the chapter is SR about Fizeau's experiment?

'the chapter is SR'? perhaps you mean 'in'?

Fizeau measured effects of moving medium on light.

Does the Fizeau Experiment Really Test Special Relativity?

Authors: Clement, Gerard American Journal of Physics, v48 n12 p1059-62

Dec

1980 The motivation and interpretation of the Fizeau experiment are reviewed, and its status as a test of special relativity is discussed. It is shown, with the aid of a simplified, purely mechanical model of the propagation of light in matter, that the experiment actually cannot

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discriminate between Galilean and relativistic kinematics. (Author/SK)

The Experiment of Fizeau as a Test of Relativistic Simultaneity
Curt Renshaw — he thinks Fizeau falsifies SR. He includes Doppler effects in his calculations in a way that may not be valid.

Do you know how to use vector addition to compute the round trip of an aeroplane?

yes. I can even use vectors to calculate instantaneous power in a reactive circuit. I don't need to use imaginary numbers or suppose that the power is imaginary.

[quote from <http://www.maths.abdn.ac.uk/events/einstein/reid.html>]
Much more recently, there was some controversy over what happens when the medium is moving at right angles to the direction of travel of the light. The result was settled by an experiment carried out here in Aberdeen in 1971, with Prof R.V. Jones building the equipment and with Prof Mike Player covering the theory. The result vindicated the predictions of Maxwell's equations and the predictions of special relativity. [unquote]

You and Dave still seem unfamiliar with this material.

<http://www.glenbrook.k12.il.us/gbssci/phys/Class/vectors/u311f.html>

Do you know how to use it to compute how much a light-clock slows?

Light clocks gave Einstein a simple way to derive the Lorentz equations. You seem to think that ONLY light clocks are effected by relativistic motion.

The fact remains that ALL of our clocks seem to be 'abnormal clocks' by your definition of normal. All seem to be influenced by relativistic motion. [quote from <http://www.maths.abdn.ac.uk/events/einstein/reid.html>]
Rossi & Hall experiment

The original experiment was done by Rossi & Hall in 1941 who measured muon fluxes not 10 km high but at the top of Mt Washington in New England, about 2 km high, and at the base of the mountain. The effect is less for a height difference of only 2 km but for their muon speeds of $0.994c$, relativistically the reduction should have been only a factor of 1.26 whereas without time dilation the reduction would be a factor of 8.5. Rossi and Hall's figures were consistent with the relativistic prediction. The experiment has since been repeated by others with convincing results.

In 1979 Bailey et al at a CERN accelerator reported a similar experiment with CERN generated muons of speeds $0.9994c$, trapped in a particle

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accelerator, that were observed in the lab to have 29.3 times the muon rest lifetime, completely consistent with time dilation.

One of the consequential results in relativity is that no bodies can travel at a faster speed than the speed of light. Nobel prize winner Sheldon Glashow and collaborator Sidney Coleman showed in 1997 that the argument could be taken further. The mere existence of very high energy cosmic ray photons reaching the Earth is strong proof, without any extra experiment, of the existence of an upper limit of the speed of light c for material bodies. Their argument is that photons decay by pair production into electrons and positrons at a rate that can be calculated from particle physics. If the upper limit to the speed of electrons differed from c by a small amount, then high-energy photons (~ 20 Tev) would decay in nanoseconds and never travel any significant distance from their point of creation. The detection of these particles on Earth sets a tight bound of an upper limit to the speed of matter being within 1.5×10^{-15} of c .

.....

Would you bet your life on Special Relativity being true? Anyone who relies on GPS in bad weather may be doing just that. Probably thousands of aircraft passengers and crew do so every day.

Conclusion

I'm showing as a final slide a table that made an impression on me when I first saw it many years ago. It lists 13 key experiments that have a testing relevance to Special Relativity in the columns, and the predictions of 6 alternative theories to Special Relativity in the rows.

The red boxes mark the places where the experimental results disagree with the predictions of the theory. Only Special Relativity is in agreement with all testing experiments.

1: Aberration, 2: Fizeau convection coefficient; 3: Michelson-Morley; 4: Kennedy-Thorndike; 5: Moving sources and mirrors; 6: De Sitter spectroscopic binaries; 7: Michelson-Morley, using sunlight 8: Variation of mass with velocity; 9: General Mass-Energy equivalence; 10: Radiation from moving charges; 11: Muon decay at high velocity; 12: Trouton-Noble; 13: Unipolar induction, using moving magnet. [unquote]

You, on the other hand seem to be a proponent of fringe science theories such as those at <http://www.wbabin.net/physics/light.htm> [quote]

Assigning the properties of superfluid to the physical vacuum allows us to provide a physical model of the interaction of the photon with the measurement system (to make more concrete, the physical meaning of the dynamics "hidden" in the four-dimensional kinematics of special relativity). Namely, at the interaction between the photon and the measurement system a precession of the spins of the micro-particles constituting the superfluid physical vacuum is generated in the vacuum (the so-called uniformly precessing domain is created). The frequency of the precession is the frequency of the photon detected by the measurement system. [unquote]

Maybe L. B. Boldyreva and N. B. Sotina, HW, KS, and Sue are right. Maybe time IS absolute and independent of motion through space. Maybe the clocks

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in the GPS satellites only SEEM to be influenced by relativity. Maybe when they are brought back to earth the missing ticks will be found to have accumulated in a little 'tick bucket' and the clocks will be shown to be the exact same age as their earthbound twins. Maybe the sun rises in the west and sets in the east.

Show me one clock that doesn't appear to be influenced by relativistic motion. [besides the pendulum clock which doesn't even run at zero G].

Why do we need to postulate some magical property of space [that we are unable to observe here] and tie the observed slowing of all kinds of clocks to the way that magical property interacts with moving matter?

bz

please pardon my infinite ignorance, the set-of-things-I-do-not-know is an infinite set.

bz+spr@xxxxxxxxxxxxxxxxxxxxx remove ch100-5 to avoid spam trap

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