

Peer Review

Review of: "An Epistemological Analysis of Einsteinian Special Relativity: Do Physicists in Reality Use Lorentzian Ether Theory?"

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I find the Abstract confusing and not clear for a standard reader. Whenever you criticise SR, you should use the standard terminology; otherwise, people get confused and won't read your work. I would suggest simplifying the Abstract significantly, accommodating the standard SR concepts together with a simple and clear definition of the Lorentz approach. It is permissible to criticise Einstein's approach, but it should be done with care since SR belongs to the standardly accepted theory of physics. You should state clearly in the Abstract whether your approach leads to some experimentally verifiable phenomenon that is different from SR. If this is not the case, then your approach is basically a formal one which may have only limited interest among scientists.

In the last paragraph of the Introduction, you explain the main point of your paper. I think this should be summarized and used in the Abstract. For instance, the sentence: "It is generally agreed that Lorentzian time dilation and length contraction are physical changes and Einsteinian ones are measurement effects due to the relativity of simultaneity [9][12]", provides an idea of what you are doing here. However, since both approaches lead to the same results, your point is that there is an inconsistency in SR, while Lorentz ether theory is, say, logically consistent. Your conclusion is that people are using SR but meaning Lorentz theory. This statement needs a detailed justification, and it seems you are providing this in the paper.

Section 2: Both K and K' measure the same proper time since in SR the space-time is flat and no gravity is present. Thus, K concludes that K' clock measures $0.64 \mu\text{s}$ because moving clocks slow down with respect to inertial observers, and vice versa. In SR, both frames are equivalent and therefore get

the same conclusions. Even Einstein once said that this temporal slowing down of clocks is apparent! You seem to support the conclusion that moving clocks slowing down is real, meaning, as far as I understand, there is an interpretation problem here. I think you should rephrase the paragraphs accordingly.

Section 3: The same holds for length contraction. Both K and K' measure the same proper length, though the moving rods seem shorter. This result follows from the fact that the speed of light is independent of K and K' motions with respect to the ether. I do not understand Eq. 3, since neither K nor K' can determine their speeds v and v' with respect to the ether. The only meaning of Eq. (3) is that the relative length change measured by K and K' is reciprocally given by Eq. (3) with v being their relative speed. Therefore, I cannot follow your arguments below Eq. (3).

Section 4: This problem is just based on SR. I do not understand what you are trying to demonstrate here. A much more succinct section is desirable.

Section 5: Do you mean that when both travellers meet on Earth again, the time has passed the same for both? It is clear that the twin problem cannot be treated within the realm of SR. If you mean you can treat it with Lorentz ether theory, then this would be incorrect.

Section 6: Discussion. You should bear in mind that the 'absolute' speed with respect to the ether cannot be measured. SR accepts this as the equivalence principle of all inertial observers.

I think you should reconsider this work again before going on with its publication.

Declarations

Potential competing interests: No potential competing interests to declare.