Proof That Einstein's Light Speed

Postulate Is Untenable

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Letter to the Editor:

Most people think that relativity is a very complex theory that only a few experts can really understand. The following remarks show that this is a completely false impression.

A basic part of the theory has to do with how different people perceive how fast an object is moving. Just take the following simple example. You are standing on a street corner as a car passes you with a speed of v= 50 km/h. The car driver reports that he sees a train moving in the same direction with speed w=30 km/h relative to him. You can safely assume on this basis that the train is moving with speed v+w = 80 km/h relative to you as you stand on the corner. It is all very easy to understand.

Now change the example so that there is a light pulse instead of a train. The light pulse moves with speed w=c relative to the car. So the relative speed of the light to you on the corner will be v+c according the above example using a train.

Einstein did not agree with this conclusion, however. He assumed [1] instead (light speed postulate LSP) that the speed of light is *independent* of the speed of the observer or light source, i.e. he argued that both v=c and w=c in the above example. He claimed that the procedure used above in the car-train example (known as the Galilean velocity transformation GVT) is only valid at low speeds much less than c.

There is a simple way to test Einstein's assumption, however. Just consider how far the light travels in a given time T relative to the car/light source on the one hand and relative to the street corner/origin on the other. In both cases, the value of the distance of separation from the light pulse is found to be cT. This result is clearly unacceptable, however, since it is impossible that the light pulse could be the same distance from both *since their two positions are not coincident at time T.*

The same procedure (*distance reframing*) can be put to good use in another way in this example. The distance moved by the light source relative to the origin is vT, while that moved by the light pulse relative to the light source is cT. The total distance separating the light pulse from the origin is obtained by simply adding these two values, with the result vT + cT = (v+c)T. (Note that the addition of distances is commonplace in everyday activities such as measuring the width of a room, whereas there is no such intuitive principle for the addition of velocities.) By definition, the speed of the pulse relative to the origin is obtained by dividing the above value by the elapsed time T, which upon cancellation gives v+c. This is exactly the value that is obtained when the GVT is applied directly. In summary, the *distance reframing procedure* contradicts the long-held position of the physics community that the motion of the light pulse relative to two different rest frames is governed by Einstein's LSP, while at the same time verifying that the GVT is totally accurate in this example as well as in any conceivable variation involving other moving objects than light.

The fact is that the GVT fails in cases in which a single observer measures the speed of an object under different circumstances, such as for the speed of light moving through a refractive medium with different speeds (Frenel-Fizeau experiment [2],whereas the LSP performs satisfactorily in its place. Einstein's mistake was to assume that the failure of the GVT in such situations rules

out its successful application in standard examples in which two observers measure their respective values for the speed of the same object. The LSP and GVT have mutually exclusive areas of applicability [3], and this fact needs to be expressly accounted for in a truly comprehensive theory of relativity.

EndNotes

[1] Einstein A. Zur Elektrodynamik bewegter Körper. *Ann. Physik* 1905, **322 (10**), 891-921.

[2] Von Laue M, *Ann. Phy*sik 1907, **23**, 989.

[3] Buenker R J, Stellar aberration and light-speed constancy. *J. Sci. Discov.*2019*,* **3(2),** 1-15.