Disproof of Special Relativity Theory, Lorentz Transformation and the Light Postulate

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Abstract

If Special Relativity is a correct theory of the speed of light, then it should reduce to classical models for non-relativistic speeds. In this paper, we reveal a glaring error in the prediction of the Special Relativity Theory (SRT) and Lorentz Transformation (LT) . A 'stationary' light source emits a short light pulse at time $t = 0$, at which instant an observer/detector is at distance D from the source and moving away from the source with velocity v. For non-relativistic velocities, the time of detection of the light by the observer/detector is equal both in the reference frame of the light source and in the reference frame of the moving observer/detector. Using strict application of Lorentz transformations, we will show that SRT makes inconsistent predictions in the two reference frames. We also present a disproof of the second postulate that has been overlooked for more than a century. By disproving both postulates, this paper dismantles the foundation of relativity theory.

Introduction

One of the many confusions and controversies with regard to the Special Relativity Theory (SRT) concerns the constancy (or non-constancy) of the speed of light and the time of detection of a light pulse relative to a moving observer/detector, such as in the Global Positioning System. Although many researchers are increasingly questioning the Special Theory of Relativity and are trying to point out its logical contradictions, its decisive disproof remains to be extremely elusive. In this paper, we present such decisive disproof which has eluded researchers and physicists for more than a century.

Disproof of Special Relativity Theory

In this paper, we present a disproof of special relativity theory by using a simple thought experiment of a light source and a moving observer. S is the reference frame of the light source and S' is the reference frame of the moving observer/detector.

Suppose that at time $t = t' = 0$, the origins (O and O') of the two reference frames coincide and that S' is moving along the x-axis with velocity v relative to S in the $+x$ direction. The light source is fixed at the origin of reference frame S and the observer/detector A is fixed at the position $x' = D$ in reference frame S'.

The light source emits a short light pulse at $t = t' = 0$. According to SRT, the speed of light is constant c in the moving reference frame S'. Therefore, the light will be detected in frame S' at:

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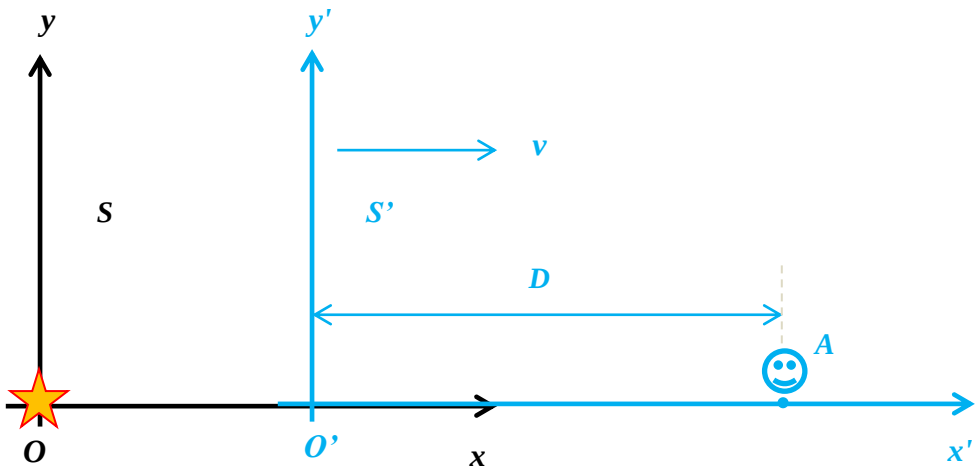
$$x' = D \quad and \quad t' = \frac{D}{c} \quad . \ . \ . \ . \ . \quad (1)$$



The Lorentz transformation is given by:

$$t' = \gamma \left(t - \frac{v\,x}{c^2} \right)$$

$$x' = \gamma \left(x - vt \right)$$

To determine the space and time coordinates of the event of light detection in frame S, we use Inverse Lorentz Transformations:

$$t = \gamma \left(t' + \frac{v\,x'}{c^2} \right)$$

$$x = \gamma \left(x' + vt' \right)$$

Therefore, the time coordinate of the event of light detection in frame S will be:

$$t = \gamma \left(t' + \frac{v\,x'}{c^2} \right) = \gamma \left(\frac{D}{c} + \frac{v\,D}{c^2} \right) = \gamma \frac{D}{c} \left(1 + \frac{v}{c} \right)$$

For non-relativistic speeds,

$$\gamma = \frac{1}{\sqrt{1 - \frac{v^2}{c^2}}} \approx 1$$

Therefore, the time coordinate of the event of light detection in frame S will be:

$$t = \gamma \frac{D}{c}\left(1 + \frac{v}{c}\right) \approx \frac{D}{c}\left(1 + \frac{v}{c}\right) \quad . \; . \; . \; . \; . \quad (2)$$

Therefore, the time of light emission in both reference frames is $t = t' = 0$. However, the time of light detection in the reference frame of the light source is different from the time of detection in the reference frame of the observer. That is,

$$\frac{D}{c} \neq \frac{D}{c}\left(1 + \frac{v}{c}\right)$$

This disproves Special Relativity Theory (SRT) and Lorentz Transformation (LT) because, if SRT was a correct theory of the speed of light, it would reduce to classical models at non-relativistic speeds which predict the same time in both reference frames.

From experience and experiments, the time in the reference frame of the source and the time in the reference frame of the observer/detector are both equal to:

$$t \approx \frac{D}{c}\left(1 + \frac{v}{c}\right) \approx \frac{D}{c - v}$$

Numerically, the two sides of the above equation are almost equal, the right hand side being the classical model. (one can check this using c = 300,000 km/s and CMBR velocity v = 390 km/s)

So far we have seen a disproof of the principle of relativity , which is the first postulate of Special Relativity. Next we see a disproof of the second postulate.

On the Second Postulate of the Special Relativity Theory

The Special Relativity Theory (SRT) is founded on the two postulates.
1. The principle of relativity
2. The speed of light in vacuum is constant c is independent of the velocity of the source.

The universal thinking within the scientific community is that these postulates are experimentally established facts. However, the first postulate (the principle of relativity) has been and is being challenged by many independent researchers, such as by those still supporting ether theory and by this author himself. The second postulate, unlike the first postulate, is accepted (almost) universally, except for few advocates of the classical emission (ballistic) theory, which are in oblivion today. Therefore, it would be surprising to question the second postulate today. This paper points to a flaw in the second postulate that has been overlooked for more than a century.

We consider two cases: 1. The observer/detector is at rest and the source is moving with velocity v, relative to the earth. 2. The source is at rest and the observer is moving with velocity v, relative to the earth. According to the principle and theory of relativity, there should be no

difference between the experimental outcomes in the two cases. We analyze each of these cases both in the reference frame of the observer/detector and in the reference frame of the source and compare the results with experimental facts. We show that the second postulate is not only in contradiction with the first postulate, but also is in disagreement with experimental facts. We argue that the only way out is to accept the existence of absolute motion. The second postulate should be corrected and restated as: the speed of light in vacuum is constant c independent of the source *absolute* velocity. But then this disproves the principle and theory of relativity.

The second postulate of the Special Relativity Theory- the velocity of the source relative to what?

The second postulate of SRT states that the speed of light is independent of the source velocity. But there is a flaw in the second postulate: the velocity of the source relative to what?

Consider two cases of a terrestrial light experiment involving a light source and an observer/detector. In the first experiment, the observer is at rest and the source is moving with velocity v away from the source, in the earth's frame. In the second experiment, the source is at rest and the observer is moving with velocity v away from the observer, in the earth's frame. Next we analyze the predicted experimental outcomes based on the second postulate for each case, both in the reference frame of the source (Fig 1a) and in the reference frame of the observer (Fig 1b) and compare the results with experimental facts, as shown in the table below.

Fig 1a

Fig 1b

Assume that the distance between the source and the observer is D at the instant of light emission ($t = 0$). We ignore the velocity of the earth relative to the sun and relative to the ECI frame to avoid complications. Also we assume $v << c$, so that $\gamma \approx 1$ and relativistic effects can be ignored.

	Time of light detection τ (assume light is emitted at $t = 0$) (based on the on the second postulate)		Experimental fact (τ)
	In the reference frame of the observer	In the reference frame of the light source	
Observer at rest and light source moving with velocity *v* directly away from the observer, in the earth's frame	$\tau = \frac{D}{c}$	$\tau = \frac{D}{c - v}$	$\tau = \frac{D}{c}$
Light source at rest and observer moving with velocity *v* directly away from the source, in the earth's frame	$\tau = \frac{D}{c}$	$\tau = \frac{D}{c - v}$	$\tau = \frac{D}{c - v}$

If the second postulate was correct and compatible with the principle of relativity, there would be agreement in the predicted times (τ) of detection in the two experiments, there would be agreement between the predictions in the observer's and source's reference frames, and agreement with the actual experimental results.

From the above table, we can see that the second postulate is disproved in both experiments. (amber shaded cells).

1. In the first experiment, that is the case of the observer at rest and the light source in motion relative to the earth, the second postulate makes correct prediction that agrees experiments in the reference frame of the observer. However, the second postulate makes wrong prediction in the reference frame of the source. In this case, the light postulate predicts that the speed of light is constant *c*. However, as can be seen from the table, this leads to a wrong prediction of τ. The correct value of τ can be obtained only by assuming $c+v$ for the speed of light in this frame, that is by substituting c-v for c.

$$\tau = \frac{D}{c - v} \quad \rightarrow \quad \tau = \frac{D}{(c + v) - v} = \frac{D}{c}$$

2. In the second experiment, that is the case of the light source at rest and observer in motion relative to the earth, the second postulate makes correct prediction that agrees with experiments in the reference frame of the source. However, it makes wrong prediction in the reference frame of the observer. In this case the second postulate predicts that (in the reference frame of the observer) the speed of light is constant *c* independent of the velocity of the source in this frame. But we can see that the speed of light depends on the source velocity in the observers frame! The

correct value of τ can be obtained only by assuming *c*-*v* for the speed of light in this frame, that is by substituting *c*-*v* for *c*.

$$\tau = \frac{D}{c} \quad \longrightarrow \quad \tau = \frac{D}{c - v}$$

The only way out is to accept the existence of absolute motion and restate the second postulate as: the speed of light in vacuum is constant *c* independent of the source *absolute* velocity. But then this disproves the principle and theory of relativity.

Conclusion

The Special Theory of Relativity is perhaps the most confusing and controversial theory in the history of science. Ever since it was proposed by Albert Einstein in 1905, it has caused endless confusions, paradoxes and debates. Countless articles have been written, proposing logical contradictions in the theory, and yet failed to pinpoint what exactly is wrong with the theory, and therefore only led to more debates rather than settle the issue once and for all. This paper has finally uncovered a decisive disproof of Special Relativity Theory that leaves no room for proponents of the theory. By applying Lorentz Transformation to a simple thought experiment involving a light source and a moving observer, we have been able to show that SRT does not consistently reduce to classical models for non-relativistic speeds. We have also seen a disproof of the second postulate that has been overlooked for more than a century, by strict application of the second postulate and the principle of relativity. By disproving both postulates, this paper dismantles the foundation of Special Relativity Theory.

Glory be to God and His Mother, Our Lady Saint Virgin Mary

Notes and references