The Lorentz transformation cannot be physical

Rasjid Chan Kah Chew, Singapore, chanrasjid@gmail.com

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1 Abstract

The Lorentz transformation will always remain only as an abstract mathematical transformation that cannot be successfully incorporated into any theory of physics. The reason being there is no natural principle that ensures real physical space positions and time be also mapped onto real positions and time. Under the projection, space would be contracted and time would be dilated; so the space and time co-ordinates cannot be associated with real physical quantities.

1.1 keywords :

special relativity;special relativity invalid;Lorentz transformation;time dilation; length contraction.

2 The Lorentz Transformation

The Lorentz transformation cannot be the correct physical co-ordinate transformation. It will always remain only as an abstract mathematical transformation that cannot be successfully incorporated into any theory of physics. The reason being there is no natural principle that ensures real physical space positions and time be also mapped onto real positions and time. Under the projection, space would be contracted and time would be dilated; so the space and time co-ordinates cannot be associated with any real physical quantities.

The Lorentz transformation is what is called in mathematics a linear transformation and mathematics is the study of abstract systems and their constructs. Special relativity is basically the Lorentz transformation from which length contraction and time dilation for moving frames are deduced.

The event points in the domain R are mapped into the image points in another space R of the moving reference frame. The co-ordinates of $E(x, y, z, t)$ and $E'(x', y'z', t')$ are just basically real numbers, pure scalars by themselves; only through some acceptable manner could the scalars be associated with the standard units of quantities used in physics.

For a stationary observer frame A by itself, we could easily associate any event $E(x, y, z, t)$ with real positions measurable through standard rods and standard clocks in the classical manner; it has always been done without any controversy. So any such event E may be termed a real event. When the Lorentz transformation is invoked, we have :

$$LT : E(x, y, z, t) -> E'(x', y', z', t'); E \in A, E' \in B$$

$E$is a real event in A through association with real rods and clocks; but that cannot be said about E' until we could make acceptable associations; before that, the co-ordinates of E' are still pure scalars. In fact the co-ordinates of E', when it is only an event which is the image under the Lorentz transformation, are only pure scalars; they cannot be associated in any manner with the measuring rods and clocks used in A.

The inertial frame B in itself, of course, is in all manner equivalent to frame A; real space co-ordinates and real time may be measured in B. But the projections of real events in A to B may not be naturally associated with real events in B.

> ***There is no natural principle that mathematical linear transformations also carry over associations of scalars with real quantities from the domain to the image.***

In special relativity, it is routinely assumed (no question was asked) that x', y', z' are also, somehow, in meter and time t' is second - but they are not! They are only pure scalars without physical unit. So whenever such scalars are used in calculations which require real quantities, the calculations would all be invalid.

Special relativity is only a mathematical model. It is not a theory in physics; it has nothing at all to do with physics which is about the real physical world. As such, there cannot be any empirical verification of special relativity as a theory.

3 Time Dilation of Special Relativity

The simple derivation of time dilation, which is a consequence of the Lorentz transformation, shows why it is wrong.

We assume A is the stationary frame as well as its own clock as event $A(x, y, z, t)$; B moving with uniform linear motion with its own moving clock as event $B(x', y', z', t')$. The Lorentz transformation for time is:

$$t' = \gamma(t - vx/c^2);$$

where $\gamma = 1/\surd(1 - v^2/c^2)$; (assume $\gamma = 10.0$)

The usual differential relation is :

$$\Delta t' = \gamma \Delta t \text{ — } (1)$$

What (1) means is that the value of a clock tick in frame A as measured in frame B (the observer B stationary in B) is $\Delta t'$ under the Lorentz transformation as required in special relativity. But this clock tick $\Delta t'$ is larger (or dilated) as compared to Δt by a factor of 10.0 - the so called time dilation as found in special relativity.

We take the principle of relativity (a reasonable assumption) to be correct:

The laws of physics are the same in all inertial frames

From this principle, a universal clock tick reproducible throughout the universe may be defined - all clocks have the same tick size (we may still follow the SI Cesium 133 standard). We could standardize clock ticks throughout the universe.

So what we have is that a stationary observer in B reading its own clock reads a universal tick of size Δt, the same undilated size, not the dilated size! But the size of the tick of clock A (now the moving clock relative to B) as measured in frame B is now the dilated size of $\Delta t'$; it is this value, $\Delta t' = 10\Delta t$, that gives rise to the supposed time dilation of special relativity.

But there is no natural principle that allow us to associate $\Delta t'$ with anything physical - the Lorentz transformation only transforms pure scalars from A to pure scalars in B; $\Delta t'$ *is just a pure scalar that has yet to be associated with anything physical*. But for frame B, the only possible physical measurement of a clock tick size is the one and only universal clock tick size Δt; so the value $\Delta t'$ has no known association with anything physical - *it is not a dilated clock tick equal to* $10\Delta t$ *seconds!* So time dilation of special relativity is only a fictitious phenomenon of motion arrived at only through a purely mathematical construct.

Also, the argument above is about time, not about clocks; only through agreement on using standard clocks to measure time would it be possible to build any coherent quantitative theory involving time as a variable. So what special relativity would have us believe is that time is relative - time runs differently depending on motion.

Of course, time dilation is patently silly. Anyone would have seen that there is reciprocity in the above argument; the roles of A and B could easily be reversed as the Lorentz transformation is symmetrical. This is basically what Herbert Dingle pointed out when he asked:

"Which of the two clocks runs slow ?".

None wanted to answer him. In the twins paradox, the only clock tick that is physical could only be the one and only universal clock tick that all clocks would observe and the astronaut twin would arrive home no younger that his earth-bound twin brother.

And Einstein's relativity theories went on to become one of the pillars of modern physics.

4 Conclusion

In view of the fact that real physical positions and time would never be transformed into real physical values, any theory of physics that invokes the Lorentz transformation would be found to be invalid. This includes Einstein's special and general theory of relativity.