A shocking discovery: Special Relativity violates it's own postulate of the constancy of speed of light

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We discovered suddenly a fact of violating the 2-nd postulate of Special Relativity by itself. Postulate, which does build the base of the Relativity at all: the constancy or invariance in Lorentz transformations of the speed of light is violated! This result is a consequence of the fact, that in Special Relativity the time is dilated, i.e. enlarged, asymmetrically in a moved inertial frame in relation to a static inertial frame and the length is not dilated, but always symmetrically for both observers contracted. The easy hypothesis is that any speed is always build by a relation of length to the time to pass this length. We analysed how Special Relativity is threatening the units of length and time and how the measured values and we did build the corresponding relations of them in units to units and in measured value to measured value. The result is a sensation as the speed of light is in two cases of four not staying constant. The basics of Special Relativity are in question.

Asymmetrical time dilation due to solution of the twins paradox

Every one knows that the traveller twin will stay younger then his brother on earth and many sources are available[1]. We know also a thumb rule “moving clocks are slower”. Time dilation does mean, that the time unit is relativistically stretched longer, enlarged, delayed. And after that those longer stretched time units will pass viewer times within the travelling time interval along a distance between A and B in space. This we can find in standard literature [1, 2] as:

\[ t' = \gamma t \] (1)

You see that it is enlarged time \( t' \) as Lorentz factor \( \gamma \) is always larger then 1. But how then they are telling of “less time” in moved inertial frames, when it is in formula clearly getting more? Indeed, it is mostly even not explained in such literature, but we can do it. This formula indeed relates not to a measured time value, but to the time unit, which is stretched, enlarged. This is made quietly, but then the enlarged time unit is used to measure the time interval during a trip between A and B by a given speed \( V \) and Lorentz factor \( \gamma \). In literature there is made no difference between time units and measured intervals of time. So we have to do it now and we define to name time units by \( \Delta t' \) and \( \Delta t \) in both inertial frames and the measured intervals by \( t \) and \( t' \).

\[ \Delta t' = \gamma \Delta t; \] (2)

\[ t' = \Delta t' n'; \] (3)

\[ t = \Delta t n; \] (4)
The length distance in space between A and B is staying same in all IF’s but will be measured by different units [3]. The same is true for time intervals. Then we can write for same “time distances” between A and B:

\[ \Delta t' n' = \Delta t n ; \]  
(5)

And we get

\[ n' = \Delta t n / \Delta t' = n / \gamma ; \]  
(6)

As we transfer back our abstract definitions the \( n \) is used equal to measured time interval \( t \) and \( n' \) to \( t' \).

\[ t' = t / \gamma. \]  
(7)

Now we see how the time in a moved IF is getting viewer number of measured time units as the travelling twin was measuring viewer years staying younger as his earths brother. It is contracted in the measured value due to a stretched unit. If anyone does not understand the way of calculating that he can just remember that the travelling brother is staying younger and the formula (7) is telling exactly that, so the result must be that by SRT.

More details how a measuring process is interpreted is available in [3] where also length measurement and units are discussed principally.

The frequency of any periodic process is red shifted to lower value in a “moved IF”, such as heart beating and emitted photons as \( f = 1/T \) and a period \( T \) is being stretched as a time unit. This is the physics behind. This stretched periods \( T \) will be counted viewer times in a time dilated IF’. This also can didactically show the physical measuring process using dilated enlarged time units to get viewer number of units.

We write the results in Table 1 in lines 1 for the unit and line 2 the measured value for the static IF. For the moved IF’ we must just calculate back, asymmetrically, as it is true that only in a “moved IF” time is slowed down, not in both. This we write in line 1 and 2 for the moved IF’ corresponding for units and measured value. The travelling twin brother’ counts so the age of his brother on earth, which was getting older then he.

The decision about which of two IF’s should be thought to be “moved IF” and which is a “static IF” is met \textit{ad hoc} in the SRT and does mean indeed in relation to earths IF being the static one and all others moved ones. SRT doesn’t answer why it is so, but we know by experiments that it is true.

**Symmetrical length contraction due to solution of bar-pole paradox**

In a huge of vividly made animations [4 - 8] one can learn about the bar pole paradox and contraction of space shuttles, trains, planets and all material entities in the moving direction. So if a meter unit of length is on board of a contracted space shuttle it is then also contracted by same Lorentz factor and that is the reason why people on board cannot recognise any contraction. So length contraction is same for the length units and length distances measured too.

Additionally the solution of the famous bar pole paradox teaches us in SRT, that the length contraction is unlike time dilation a completely \textit{symmetrical} process: each of observers is seeing the other contracted in moving direction. This was produced by using a principle of simultaneity and synchronized clocks.
We define again units \( \Delta l' \) and \( \Delta l \) and measured values \( l \) and \( l' \).

\[
\Delta l' = \Delta l / \gamma \quad (8)
\]
\[
l' = l / \gamma \quad (9)
\]

both being contracted as we learned above by SRT. And same we get for the observer in moved IF too.

\[
\Delta l = \Delta l' / \gamma \quad (10)
\]
\[
l = l' / \gamma \quad (11)
\]

We write it again in lines 3 and 4 in Table 1 for units and measured values in moved and static IF’s.

We also can recognize already that formulas (8) and (9) are mathematically contradicting to (10) and (11). But this is SRT’s basics.

**Speed of light in units**

Now it is easy for us using the lines in Table 1 to calculate the speed of light for Lorentz transformed units and for measured values each by itself. We have got 4 relations.

In static IF line 7:

\[
c' = (\Delta l / \gamma) / (\gamma \Delta t) = \Delta l / \gamma^2 \Delta t; \quad (12)
\]

And in the moved IF’ line 7:

\[
c = \gamma \Delta l' / \gamma \Delta t' = \Delta l' / \Delta t; \quad (13)
\]

**Speed of light in measured values**

In line 8 for static IF:

\[
c' = (l / \gamma) / (t / \gamma) = l / t \quad (14)
\]

In line 8 for moved IF’:

\[
c = (l' / \gamma) / (\gamma t') = l / \gamma^2 t; \quad (15)
\]

**Results**

The result is very strange as only two formulas (13) and (14) of four are confirming the invariance of speed of light, while formulas (12) and (15) are violating the constancy of speed of light and so the 2-nd postulate of the SRT too! We must conclude that the speed of light has to be invariant in all four constellations using units and measured values too.
This result shows a very deep problem, a paradox of the SRT, which we cannot solve easy within SRT.

<table>
<thead>
<tr>
<th></th>
<th>Special Relativity’s Interpretation of Lorentz transformations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>time unit</td>
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<tr>
<td></td>
<td>$\Delta t' = \gamma \Delta t$</td>
</tr>
<tr>
<td></td>
<td>$t' = t / \gamma$</td>
</tr>
<tr>
<td>2</td>
<td>time measured</td>
</tr>
<tr>
<td></td>
<td>$\Delta t = \Delta t' / \gamma$</td>
</tr>
<tr>
<td></td>
<td>$t = \gamma t'$</td>
</tr>
<tr>
<td>3</td>
<td>length unit</td>
</tr>
<tr>
<td></td>
<td>$\Delta l' = \Delta l / \gamma$</td>
</tr>
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<td>4</td>
<td>length measured</td>
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<tr>
<td></td>
<td>$\Delta l = \Delta l' / \gamma$</td>
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<td></td>
<td>$l = l' / \gamma$</td>
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<tr>
<td>5</td>
<td>mass unit</td>
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<tr>
<td></td>
<td>$\Delta m' = \gamma \Delta m$</td>
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<tr>
<td></td>
<td>$m' = \gamma m$</td>
</tr>
<tr>
<td>6</td>
<td>mass measured</td>
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<tr>
<td></td>
<td>$\Delta m = \gamma \Delta m'$</td>
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<td>$m = \gamma m'$</td>
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2-d postulate: speed of light $c = \frac{l}{t}$

<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>7</td>
<td>in units</td>
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<tr>
<td></td>
<td>$c' = (\Delta l / \gamma) / (\gamma \Delta t)$</td>
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<tr>
<td></td>
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<td>8</td>
<td>in measured values</td>
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<td></td>
<td>$c' = (l / \gamma) / (t / \gamma) = l / t$</td>
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<tr>
<td></td>
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<td></td>
<td>$= l / \gamma^2 t$</td>
</tr>
</tbody>
</table>

Tab. 1  The SRT in Lorentz transformations for units and measured values

The violation of the 2nd postulate in SRT occurs both according to units and according to measured values, but once each in the moving and resting IF, since 2 out of 4 calculations happen to come out correctly, but do contradict the 2 other incorrect results, greyed out.

The failure is evident and seems to be not repairable in SRT as it is installed deeply in its basics which did define time to be an asymmetrical and length a symmetrical relativistic attributes. So they run from each other.

We invite any one to find a theoretical solution, how to explain these physically discovered relativistically paradox and a deep principle problem in SRT - even if any one at the moment is shocked and don't want to believe it.

**Solution**

We also invite the reader to be one of the first to discover our solution, which is based on 4 more another discovered paradoxes [9-12]. This all together did lead us to develop a new Relativity Theory [13-16].
References:


The contraction in length.


[4] Gaßner, J., special theory of relativity: time travel, twin paradox, muons (13), most recently available at https://www.youtube.com/watch?v=7xyAI4CeIFU & list = PLmdf0YiVUvGGAE-3CblEoJM3DJHAArzj & index = 13


[7] Youtube channel, minutephysics, Length Contraction and Time Dilation, Special Relativity Ch. 5, available at https://www.youtube.com/watch?v=-NN_m2vKAk


[16] Schatz, V., Minkowski Diagram with Unit Hyperbola Contradicts the SRT and a Gravitational Level Relativity is Born, preprint available at https://vixra.org/abs/2106.0126