

A discovered 2nd Triplet Paradox of Special Relativity

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We discovered a second triplet paradox of dynamic relativity such as Special Relativity after we discussed a first triplet paradox, which was known and solved as being just double of two twin paradoxes, who both after a relativistically trip will be just equally younger then the earths person. The second paradox is if one asks about the relation between the two antiparallel moved astronauts themselves as they do have even a bigger speed difference and a Lorentz factor between them, but nevertheless having same time dilation in relation to the earth. How to explain that switched of time dilation? What is about the other relativistic attributes length contraction and mass enlargement? And same would be to ask if the moving directions of two astronauts do have any another angle to each other. It was concluded that in SRT and no other known theory no solution is available to this new paradox. All are invited to find a solution and we offer by citation our solution too.

Twin paradox and a two triplet paradoxes

All previous qualitative model explanations have never provided a valid reason for preferring the selection of the "moving inertial frame" for the solution of the twin paradox. The acceleration could be eliminated. It is stated that a change of the inertial frames took place - but that also fails, because from the inertial frame of the moving, the earth changes its inertial frame twice. But we just accept that *ad hoc* rule of SRT with the unexplainable thumb rule "the moved clocks are slower".

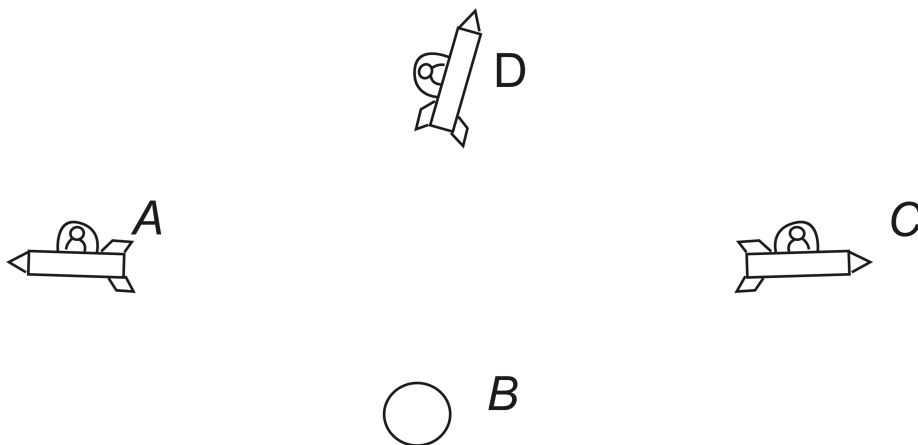


Fig. 1. Triplets space travellers A and C on an antisymmetric journey with respect to Earth B and a 4th traveller D in a crossing direction.

Fig. 1 shows two symmetrically antiparallel travellers A and C with respect to Earth B. In the SRT literature it is known as a triplet paradox merely as a double case of the twin paradox. The first

triplet paradox can be found in old relativistic standard books like by professor Greiner at the university in Frankfurt in 70-this [1]. In this book there is an exercise for students about those triplet paradox and it has a solution too, which is very short in two sentences. It tells that this are just two times twins paradox which is him self solved and that's it.

The question that we are presumably asking for the first time was never asked - what is the relativistic effect between the two astronauts *who travelled anti-parallel*? Between them the speed difference is relativistically added larger than in each case in relation to the earth. This speed sum must be calculated according to relativistic speed addition and results in a number that must always be smaller than speed of light c .

We then have two different Lorentz factors, a γ_1 in relation to Earth B and a larger γ_2 between the two anti-symmetrically moved astronauts A and C travelling anti-symmetrically in space. Because both space travellers carried out completely symmetrical journeys, their on-board time must have been dilated in the *same way* and they come afterwards, aged *just* younger as their brother who stayed on earth. This is that known result in 1-th triplet paradox as told above, but we want look at that second triplet paradox:

$$\gamma_2 > \gamma_1; \quad (1)$$

For both travellers we can say that their γ_2 must have caused something unexpected for them on board. Their time dilation in relation to earth was the *same* and therefore the time on board flowed *more slowly*. So there is no time difference between their on-board clocks.

At the same time, however, we can legitimately using SRT use γ_2 to mutually calculate that the respectively other is relativistically *heavier* with γ_2 than one himself. Both find this in relation to the other. According to the SRT, the same applies to length contraction! The other is shortened in length - this teaches us the "barn-pole paradox" of the SRT, which is considered to be resolved, is taught by its *symmetrical* interpretation of the length contraction.

The time dilation, of all things, is asymmetrically out of line between the space travellers and has been suspended!? A "*selective relativity*" only takes place for lengths and masses, but not for time? We discovered a *selective* relativity, which is not to explain in SRT.

Likewise, the question must be answered, which of the two antiparallel moving spaceships A or C is to be regarded as a "moving inertial frame" in relation to the other? You will probably want to call them both that way in relation to earth - but we are interested in the relation between the two. They just did meet in space and they are from different civilisations in universe. This is even more difficult to explain, then the same to decide why Earth is the "unmoved IF".

Additionally a third and any n -th number of travellers like D can be thought in any direction and if the speed is same in relation to earth B, then also the time dilation will be the same as in A and C. But the speed difference between the D and A or C can be very different dependent on the angle between the moving directions of them.

That is why we call it a ***second triplet paradox*** which was unknown before and we must conclude, that we don't know how to explain that in SRT or in GRT, General Relativity Theory too.

According to SRT the time dilation between A and C must be larger than of each of them to Earth B. There is no other interpretation possible. And if so, then only one of them A or C must have a superior time dilation in relation to the other one. But as they are moved antiparallel and everything is symmetrical it is not to decide which of them must have “more time dilation”. And when so divided by an until now unknown principle, how they get being equal younger after they finish the trips on the earth?

Any one is asked to find a solution, how to explain that discovered paradox.

A solution leads to a new relativity theory

We did it already and we can invite the physicists to discover our solution here [2, 3]. This uses a discovered hypothetical Gravitation Doppler effect and it caused Gravitation Relativistic Levels, which do the difference and explain, that the travellers A, C and D are in the same Doppler shifted Gravitational Level, but can have *mirrored* levels like A and C or *angled* ones as D and A, C.

There is a bigger work developed in some articles [2, 3, 4, 5, 6] on about 100 pages to read which did worked out a new relativity theory, a Gravitational Level Relativity GLR. Still more new relativistic paradoxes [3, 4] and a failure were discovered and did lead to that solution as a consequence.

References:

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- [3] Schatz, V., Gravitational Doppler and Level Relativity Solved a Discovered Momentum Paradox and Identified the Cause of Relativity, preprint available at <https://vixra.org/abs/2106.0017>
- [4] Schatz, V., Planck Constant Discovered to be 4-th Relativistic Attribute, preprint available at <https://vixra.org/abs/2106.0031>
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- [6] Schatz, V., Minkowski relativity due to unit hyperbolas contradicts the SRT and solution in a Gravitational Level Relativity, preprint available at <https://vixra.org/abs/2106.0126>