Absurd Accusations that the Special Theory of Relativity is, Generally, Logically Inconsistent

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Abstract: It is obvious that the Special Theory of Relativity (SR) applies only to systems containing physical inertial reference systems, each equipped with a physical clock initially synchronized with other clocks. This leads to the conclusion that it is easy to prove that SR is logically inconsistent when we try to describe, via SR, a system in which listed above two conditions, i.e. inertia and initial synchronization, are simultaneously not satisfied. Contrary to the SR based on the Lorentz Transformation, the SR based on the law of conservation of spin shows that we cannot synchronize clocks separated spatially with non-zero relative velocity (both theories lead to the same formulae). Here we described the initial conditions which must be satisfied to obtain a system composed of physical inertial reference systems with initially synchronized physical clocks. In previous papers we showed why SR sometimes leads to formulae which do not concern Nature - it applies to the SR contraction in length and phenomena in which, apart from radial velocities automatically appear, due to flows in the Einstein spacetime, transverse velocities also.

1. Introduction

The Einstein Special Theory of Relativity (SR) does not concern all phenomena – this theory can be applied to selected phenomena that do not violate the SR initial conditions. The SR initial conditions say that we can apply this theory only to systems containing physical inertial reference systems, each equipped with a physical clock initially synchronized with other clocks. This leads to the conclusion that it is easy to prove that SR is logically inconsistent when we try to describe a system in which listed above two conditions, i.e. inertia and synchronization, are simultaneously not satisfied.

Here we described the initial conditions which must be satisfied to obtain a system composed of physical inertial reference systems with initially synchronized physical clocks.

In previous papers we showed why SR sometimes leads to formulae which do not concern Nature – it concerns the SR contraction in length [1] and phenomena in which, apart from radial velocities automatically appear, due to flows in the Einstein spacetime, transverse velocities also [2], [3].

The Scale-Symmetric Theory (SST) [4], [5], shows that SR acts correctly only when the initially synchronized reference systems know the state of the underlying dark energy or

Einstein spacetime (ES) [2]. Moreover, SST shows that SR can act correctly only when the ES is gravitating and grainy whereas the spins of stable particles are invariant [1]. It means that SR is physically an incomplete theory. Without the SST, the SR is not well understood so there are accusations that SR is logically inconsistent. But the truth is much simpler – just SR is an incomplete theory.

2. Synchronization of physical clocks

According to SST, Nature can be synchronized due to the superluminal quantum entanglement [4] so there can be in existence synchronized very-big/cosmic regions – even it can concern the whole Universe because the characteristic speed for quantum entanglement, $v_{entanglement}$, is about $2.4 \cdot 10^{59}$ times higher than the speed of light in "vacuum" c i.e. $v_{entanglement} = 0.72 \cdot 10^{68}$ m/s [4]. If D denotes size of the clocks then the lower limit for time to change a state of a clock, Δt_{clock}, is $\Delta t_{clock} = D / v_{entanglement}$. Due to the superluminal quantum entanglement, we cannot control states of the physical clocks (we will call them clocks). An observer can synchronize clocks with the upper limit for speed equal to c as it is in SR. The lower limit for time of synchronization of clocks, $\Delta t_{synchronization}$, is $\Delta t_{synchronization} = L / c$, where L denotes distance between clocks, and this time must be shorter than Δt_{clock} i.e. $L < D\ c / v_{entanglement} \rightarrow 0$ (notice that even for the interactions with the speed c, i.e. instead $v_{entanglement}$ is c, is $L < D$ i.e. to synchronize clocks, initial distances between clocks must be smaller than their sizes). It leads to conclusion that initially all clocks, which we want to synchronize, must be in the same physical inertial reference system (we will call it reference system). Using the mathematical language, we can say that initially the zero-points of all geometrical frames of reference (we will call them frames of reference) must overlap. Initial separation of the zero-points of frames of reference leads to the incorrect conclusion that SR is logically inconsistent.

Assume that somebody via sent photons can see apparent states of separated spatially clocks with non-zero relative velocities i.e. can see the time indicated by such clocks. It suggests that such observer can synchronize the clocks. It is not true. Contrary to the SR based on the Lorentz Transformation (SR-LT) [6], the SR based on the law of conservation of spin (SR-LCS) [1] shows that we can not synchronize clocks separated spatially with non-zero relative velocity (both theories lead to the same formulae). It follows from the fact that physical clocks are built of zero-spin and non-zero-spin particles. On the other hand, in SR is assumed that speed c is invariant so it should concern the particles the physical clocks are built of as well. It means that in moving clocks, the spin speeds of particles depend on the relative velocities of the clocks – higher relative velocity of a clock means lower spin speed of particles it consists of [1]. Since period of spinning of a particle (it must be treated as inner unit of time) depends on relative velocity of clocks so we can not control the inner clocks of the particles the clocks consist of i.e. we can not control the inner clocks of the clocks – we can see that we can not synchronize clocks separated spatially with non-zero relative velocity. Just the used photons can not see the different states of the inner clocks of, for example, nucleons – such inner clocks in different physical clocks are going in different way.

3. How to create a system containing separated inertial reference systems, each equipped with a clock initially synchronized with other clocks?

We can solve this problem assuming that the initial reference system, i.e. the frame of reference of observer (the "stationary system" K [6]), has mass, M_K, much higher than the reference systems, m_k, which embark on a journey i.e. the "moving systems" k [6] – then, the "moving systems" k practically can not change velocity of the "stationary system" K so it still

is the inertial reference system. It as well solves the reciprocation of the SR time dilation (each observer in K and k claims that the moving clocks are time dilated) or the reciprocation of the real relativistic mass [1]. For example, both observers in two inertial reference systems with non-zero relative velocity claim that in the other reference system time is dilated in the same way – it is a logical inconsistency. We can eliminate such reciprocation assuming that $M_K >> m_k$.

Notice as well that, in reality, the "rest masses" of particles in the "stationary system" K depend on speed of K in relation to the underlying ES or/and dark energy (the aether) if, of course, inertial reference systems know the state of the aether [2]. SST shows that the aether is superfluous when propagating objects do not know the state of the underlying aether – it concerns, for example, the electromagnetic waves far from black holes but it does not concern, for example, rotating neutron black holes [5].

Next problem associated with the synchronization of clocks within SR-LT follows from the superluminal quantum entanglement. SST shows that due to the entanglement of emitted light with its source or a last-interaction object (it can be a detector), the speed of light c is the speed in relation to source or a last-interactions object – such is the correct interpretation of the Michelson-Morley experiment – just detectors always measure speed of light equal to the c but it does not mean that speed of light is invariant simultaneously in relation to all reference systems with non-zero relative velocities. We can say that the invariance of c follows from the quantum entanglement of photons with detectors that detect them. But this problem is not important when we investigate real properties of particles moving in a dominating inertial reference system i.e. when masses of particles are much lower than theirs emitters – then the SR-LT or SR-LCS formulae for relativistic mass or time dilation are still valid.

4. Why the SR contraction in length does not concern Nature [1]?

We can not define within SR a non-zero length because to do this we need two reference systems with initially separated the zero-points of the associated frames of reference. Just the formula for length contraction does not appear in SR based on the law of conservation of spin (LCS) – it shows the domination of the SR based on the law of conservation of spin over the SR based on the Lorentz Transformation (LT).

5. Why transverse velocities violate SR?

Within SST we showed that, for example, in a free-fall on a "black hole", near to its Schwarzschild surface and inside it, due to the inspiralling Einstein spacetime, there appear transverse velocities also [1], which do not appear in SR-LT. It leads to conclusion that SR-LT is an incomplete theory.

6. Summary

The Special Theory of Relativity applies to systems containing physical inertial reference systems, each equipped with a physical clock initially synchronized with other clocks.

We showed that it is easy to prove that SR-LT is logically inconsistent when we try to describe, via SR-LT, a system in which listed above two conditions, i.e. inertia and initial synchronization, are simultaneously not satisfied.

SR is an incomplete theory because it says nothing about internal structure of particles, of dark matter, dark energy, spacetime, and interactions of them.

Here, applying the SR based on the law of conservation of spin (it leads to the same formulae as the SR based on the Lorentz Transformation), we showed that synchronization of clocks separated spatially with non-zero relative velocities is impossible. We showed as well

how we can produce a system composed of inertial reference systems with synchronized clocks.

SST shows that the SR energy-momentum relation, the SR formula for relativistic mass, and the formula for time dilation in regions far from a black hole, are correct – we derived them on the basis of the law of conservation of spin of particles [1], not on the basis of the Lorentz Transformation [6].

SST shows also that SR leads indirectly to the gravitating grainy Einstein spacetime [1].

In SR-LT we agree that clocks are synchronized – it is only a convention. This means that the logical consistency of SR based on LT is independent from synchronization procedures that sometimes can be logically inconsistent.

SST shows the weak points of all synchronization procedures. Just behaviour of clocks is relative as well i.e. depends on velocity and position. SST shows that it is better to formulate SR on the basis of LCS instead of LT. Then we eliminate the problems concerning the synchronization of clocks and we obtain the correct synchronization procedure.

We used the word “generally” in the title of this paper because there are phenomena beyond the SR-LT that can not be fully described within such theory – then we must apply SST and SR-LCS.

Relativity of simultaneity follows from the assumption that c is the invariant maximum speed in Nature. But SST shows that the superluminal speed characteristic for quantum entanglement is much, much higher. It means that upper limit for time to exchange information in the observed Universe is $\sim 10^{-42}$ s – we can say that due to the superluminal quantum entanglement (and tachyons [4]), the relativity of simultaneity is practically not valid for Nature but is valid for observers using light signals. Notice as well that the relativity of simultaneity is of only secondary importance for the synchronization procedure because the most important phenomenon is the dependence of the inner units of time on velocity of clocks and state of the local spacetime and dark energy seen or unseen by the clocks.

References

[1] Sylwester Kornowski (14 March 2017). “Einstein’s Special Theory of Relativity and Gravitational Time Dilation from the Law of Conservation of Spin” http://vixra.org/abs/1703.0066

[2] Sylwester Kornowski (14 March 2017). “Gravitational Time Dilation for a Free-Fall on Neutron Black Hole” http://vixra.org/abs/1703.0139

[3] Sylwester Kornowski (25 January 2016). “The Revised Theory of Black Holes and Accretion Discs” http://vixra.org/abs/1508.0215

[4] Sylwester Kornowski (6 June 2016). “Foundations of the Scale-Symmetric Physics (Main Article No 1: Patricle Physics)” http://vixra.org/abs/1511.0188

[5] Sylwester Kornowski (29 June 2016). “Foundations of the Scale-Symmetric Physics (Main Article No 2: Cosmology)” http://vixra.org/abs/1511.0223

[6] Einstein, A. (1905). “On the electrodynamics of moving bodies” *Annalen der Physics*, 17, 1905