About the second postulate of STR[1)]

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Probably, the orthodox physics considers embarrassing question: *do we need a second postulate for the construction of the Special Theory of Relativity?* However, this issue was raised and considered by at least two independent authors [1, 2]. This topic is proposed for discussion.

If the Lorentz's transformations can be derived from the basic properties of the substantionally space and time, is it important (as separate postulate) that the speed of light propagation does not depend on the speed of motion of the inertial frame of reference in which light is propagated and its speed is measured, because the same fact of independence may be derived from the themselves transformations obtained?

It is possible to "build" and such logic. As of today, we know that the speed of light is the maximum of all measured speeds. Since it is the maximum, it means that it is the only one at this moment - there are no two maximum. Since the condition of its uniqueness meets the requirements for the standards of physical measurements, the process of light propagation can be accepted as an alternative to the measurement of space-time relations against the classical standards of length and time. If the process is detected with a signal propagation speed greater than the speed of light propagation,, the logic of the derivation of the law of addition of speeds will not change. Just in the Lorentz transformation formulas, the rate c is replaced by, say, $\tilde{c}$. And if we take this rate as a unit of measurement, then the Lorentz transformations will remain unchanged. Thus, we can say that the kinematics of the space-time relations of STR will not change if the speed $\tilde{c} > c$ is detected.

The above-mentioned works opened additional opportunities macrophysics associated with the independent coexistence of two methods of arithmetization and metrization spatio-temporal relations – using classic length and time standards and a single standard speed of the standard signal.

These opportunities were understood after the emergence of GTR. The use of the first opportunity leads to the transformation of Galileo, the use of the second - to the transformation of the Lorentz. However, for the Newtonian substantive concept of space and time, these possibilities have led to fatal contradictions, since Galileo's transformations are also derived from the basic properties of the substantial space and time. This is a controversial representation of the Newtonian concept.

The resolution of this contradiction led to the birth of the principle of local Lorentz invariance and to the need to distinguish coordinate and own times: coordinate time became affine, and own time - physically measurable with the help of standards (metrizable). The non-distinction of coordinate and proper time leads, in particular, to the appearance of the "Twin Paradox" [3] (See. read more [4]).

Links

[1]. ЯП Терлецкий. *Вывод преобразований Лоренца без постулата о постоянстве скорости света.* В кн. Парадоксы теории относительности. М., "Наука", 1966, (стр. 23).
https://www.dropbox.com/s/pjdb2qxxyu4eapi/Terletskii-2.pdf?dl=0

[2]. НД Мермин. *Теория относительности без постулата о постоянстве скорости света.* В сб. '86 Физика за рубежом. Серия Б. Сборник статей. М., "Мир". 1986, (стр. 173).
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[3]. ВА Касимов. *Парадокс близнецов*. Новосибирск. 2014.
https://www.academia.edu/32443266/

[4]. В.А. Касимов. *О постулате постоянства скорости света в СТО*. Новосибирск, 2015 г.
https://www.academia.edu/32427342/

[1)] **I beg your pardon for my not very good English!** The original text on Russian: http://vixra.org/pdf/1804.0355v1.pdf

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V.A. Kasimov. About the second postulate of STR (English version)

Abstract
Probably, orthodox physicists will consider the question indecent*: Is the second postulate necessary for the construction of a Special theory of Relativity?* Nevertheless, this issue was raised and considered by at least two independent authors [1, 2]. This topic is proposed for discussion.