

# *Journal of Theoretics*

Volume 6-1, Feb-March 2004

---

## **On Logical Errors Underlying the Special Theory of Relativity**

Temur Z. Kalanov

[t.z.kalanov@mail.ru](mailto:t.z.kalanov@mail.ru)

[tzk\\_uz@yahoo.com](mailto:tzk_uz@yahoo.com)

Home of Physical Problems,  
Pisatelskaya 6a, 700200 Tashkent, Uzbekistan

**Abstract:** The kinematic basis of the special theory of relativity is analyzed critically. It is shown that the basis includes the essential logical errors. They are irrefutable proof of incorrectness of the generally accepted theory.

**Keywords:** special relativity.

Science is an inductive way of knowledge of the world. Consequently, the scientific truth (as a system of experimental facts and theories) obeys the principle of dialectical development. The dialectical development (i.e., quantitative and qualitative changes in the direction of ascension from simple forms to complicated ones) of the truth includes the “birth and extermination” of some theories, transformation and unification of others. Selection of theories is done on the base of criteria of validity. According to Einstein, there exist two criteria: the “external justification” criterion (i.e. agreement with experimental data) and the “internal perfection” criterion (i.e. accordance with the laws of logic, with sense of harmony and of beauty). The theories that do not satisfy these criteria are obviously incorrect. But they are not unavailing ones. Incorrect theories are the psychological means of surmounting of borders of human consciousness. In my point of view, one of such incorrect theories of the 20th century is Larmor-Lorentz-Poincare-Einstein’s special theory of relativity. Today all physicists know this theory, many analyze critically consequences of it, but only some are aware of instability of the foundation of the theory.

I have critically analyzed [1-9] the kinematic basis of the special theory of relativity: namely, the interference experiments and the calculations of Michelson-Morley, the contraction hypothesis and the Lorentz transformation formulae. The results of the analysis are as follows.

(1) The statement that there exist the contradiction between the experimental and calculated data of Michelson-Morley is a starting-point of Larmor-Lorentz-Poincare-Einstein’s special theory of relativity. One can be aware of cause of this contradiction on a basis of the following idea. The Earth and the Sun are in a relative motion ( $V$  is the velocity of the relative motion). This means that the Earth is a moving system of reference  $E$  only in the Sun system of reference  $S$ , and the Sun is a moving system of reference  $S$  only in the Earth system of reference  $E$ . The Michelson-Morley interferometer and an observer (doing measurements and calculations) are in the Earth system of reference  $E$ . Consequently, the interferometer and the observer are in

the resting system  $E$ . In accordance with the laws of logic, the comparison of experimental and calculated data with each other must be done in the resting system  $E$ .

(2) The contradiction between the experimental and calculated data of Michelson-Morley is due to that the fundamental comparison between them was done incorrectly. In fact, the experimental and calculated data belong to the different systems of reference: the experimental data belong to the reference system  $E$  related to the Earth, and the calculated ones containing the velocity  $V$  of the motion of the Earth belong to the reference system  $S$  related to the Sun. Therefore, the comparison of this data with each other is the first and principal logical error. This error leads inevitably to the contraction hypothesis and its mathematical representation – the Lorentz transformation formulae.

(3) The experimental and calculated data of Michelson-Morley are in complete agreement with each other if they belong to one and the same reference system  $E$  related to the Earth. From the viewpoint of logic, this means that the contraction hypothesis and the Lorentz transformation formulae are not in agreement with Michelson-Morley's experiments and formulae (i.e. the incorrectness of the contraction hypothesis and of the Lorentz transformation formulae is proved by the experimental data).

(4) Physical meaning of the Lorentz transformation formulae is revealed if a starting-point of the theoretical analysis is represented by: (i) the standard way of deduction of Lorentz's formulae, i.e. the way of introduction (insertion) of the Galilean transformation into the equation for the front of the light wave; (ii) the principle of existence and of transformation of coordinates: there are no coordinates and no transformation of coordinates in general, and there exist the coordinates and transformation of the coordinates of the object only. Actually, it is revealed by the following. (a) The front (i.e. the point) of the light beam (for example, in the Michelson-Morley interferometer) is a physical object  $L$ . The equation for the front of the light beam in the system of coordinates  $S$  (i.e. the Sun) is given by the expression:  $x_L = ct$  where  $c$  is the velocity of light in vacuo (light is propagated in the positive direction of the axis  $Ox$ ),  $t$  is time. (b) The material point (for example, Michelson-Morley interferometer's mirror which is in the system of coordinates  $E$  (i.e. the Earth)) is an object  $M$ . The Galilean transformation relates the coordinates of the point  $M$  in the systems  $S$  and  $E$ :  $x_M = Vt + x'_M$  where  $V$  is the velocity of motion of the system  $E$  relative to the system  $S$  in the positive direction of the axis  $Ox$  ( $V < c$ ). (c) Introduction (insertion) of the Galilean transformation into the equation for the front of the light beam means equality between the coordinates:  $x_M(t) = x_L(t)$ . The equality between the coordinates of the objects  $M$  and  $L$  means an intersection (coincidence) of the objects  $M$  and  $L$  with each other. Hence, the physical meaning of such introduction (insertion) is that it means the intersection (coincidence) of the objects  $M$  and  $L$  with each other. (d) If  $x_M(t) = x_L(t)$  is an equation for  $t$ , then a solution is given by the Michelson-Morley formulae:  $t = D/(c - V)$  (in the system  $S$ ) and  $t = D/c$  (in the system  $E$ ) where  $D$  is the length of the interferometer's shoulder. (e) The statement that the equalities  $x_M = x_L$  (in the system  $S$ ) and  $x'_M = x'_L$  (in the system  $E$ ) must be valid at any moment of time results in the Lorentz transformations (formulae):  $x_M = \gamma(x'_M + \beta x'_L)$ ,  $x_L = \gamma(x'_L + \beta x'_M)$  where  $x_L = ct$ ,  $x'_L = ct'$ ,  $\beta \equiv V/c$ , and  $\gamma \equiv (1 - \beta^2)^{-1/2}$  is the contraction factor. (f) From the Lorentz transformation formulae, it follows that the equalities  $x_M = x_L$  and  $x'_M = x'_L$  are valid at any moment of time. Hence, the physical meaning of the Lorentz formulae is that they express the intersection (coincidence) of the objects  $M$  and  $L$  with each other at any moment of time.

(5) Michelson-Morley's formulae represent conditions that individual light point  $L$  coincides with interferometer's mirror  $M$  at the certain moment of time. Therefore, the spatial coordinates of the point of coincidence (intersection) and the time of coincidence are constant in those formulae.

(6) The second logical error is that the spatial coordinates of the point of coincidence (intersection) and the time of coincidence are variables in the Lorentz transformation formulae. From the viewpoint of the Michelson-Morley experiments, this error means that the individual light point  $L$  coincides with the mirror  $M$  at any moment of time. Consequently, a relation between the

spatial coordinates and the time is appeared. But the existence of such relation is in conflict with: (i) the principle of constancy of light velocity (because a mirror can be always considered as a light source or receiver); (ii) the essence of time [4, 8].

(7) The third logical error is that the Lorentz transformation formulae include the contraction factor  $\gamma$ . The contraction factor  $\gamma$  transmutes mutually independent motions – the motion of the mirror  $M$  (i.e., of the light source or receiver) relative to the Sun and the motion of the light  $L$  – into dependent motions. Because of it, the dependence of the velocity  $V$  of the mirror upon the velocity  $c$  of the light is appeared to and has the form  $V/c < 1$ . Moreover, the spatial and time intervals become dependent on  $V$ . Consequently, the contraction factor is in conflict with the principle of constancy of light velocity.

(8) The principle of constancy of light velocity is valid in any arbitrary system of reference. Actually, if the velocity of light in vacuo is independent of the velocity of light source or receiver, then it is also independent of change of velocity of light source or receiver.

(9) The constancy of light velocity is explained by the fact that the light is not a material point of classical mechanics, and it is a multitude of quantum particles – photons. The motion of any quantum particle (in particular, photon) relative to a system of reference is the absolute motion [6, 9]. The absolute motion is invariant under choosing a system of reference (this means that the velocity addition theorem is not valid).

(10) Einstein's formula  $E = mc^2$  (where  $m$  is the mass of the material point) is incorrect because the multiplication of the quantities characterizing not one and the same (unitary) object but the different (mutually independent) objects is a logical error [6, 9]. Hence, this is the fourth logical error.

From the above, it follows that: (a) the special theory of relativity is absolutely incorrect; (b) the principle of constancy of light velocity is a reference point of the new quantum theory [6, 9].

## References

- [1] T.Z. Kalanov, "Correct theoretical analysis of the Michelson-Morley experiments", Doklady Akademii Nauk Respubliki Uzbekistan, No. 11-12, 1995, p. 22.
- [2] T.Z. Kalanov, "Proof of non-correctness of the Lorentz transformation", Doklady Akademii Nauk Respubliki Uzbekistan, No. 1-2, 1996, p. 32.
- [3] T.Z. Kalanov, "For the theory of relative motion", Doklady Akademii Nauk Respubliki Uzbekistan, No. 12, 1997, p. 15.
- [4] T.Z. Kalanov, "For the theory of time", Doklady Akademii Nauk Respubliki Uzbekistan, No. 5, 1998, p. 24.
- [5] T.Z. Kalanov, "Kinematics of material point: modern analysis", Doklady Akademii Nauk Respubliki Uzbekistan, No. 7, 1999, p. 9.
- [6] T.Z. Kalanov, " $E \neq mc^2$ : The most urgent problem of our time", Doklady Akademii Nauk Respubliki Uzbekistan, No. 5, 1999, p. 9.
- [7] T.Z. Kalanov, "On logical errors lying in the base of special theory of relativity", Bull. Am. Phys. Soc., V. 46, No. 2, 2001, p. 99.
- [8] T.Z. Kalanov, "On the essence of time", Bull. Am. Phys. Soc., V. 47, No. 2, 2002, p. 164.
- [9] T.Z. Kalanov, "On a new basis of quantum theory", Bull. Am. Phys. Soc., V. 47, No. 2, 2002, p. 164.

Received March 2003

[Journal Home Page](#)