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Cutting-off Einstein's Special Relativity Theory by Occam's Sickle

(How the mountain (Large Hadron Collider) has brought forth a mouse)

Mamaev A. V., Candidate of engineering sciences, Bureau Chief

JSC "Lianozovo Electromechanical Plant R&P Corp.", Russia

Abstract In this paper it is shown that Einstein's special relativity theory is a self-contradictory theory. The contradiction between two Einstein's postulates is eliminated by refusal from the Einstein's second postulate, basing upon the Occam's advice to decrease the quantity of basic postulates to a single one. From this single postulate a law of dependence of the speed of light propagation in vacuum on the speed of light source motion was derived. Then a new transformation without invariance of light speed and without prohibition of superlight speeds is derived instead of Lorentz's transformation followed by discovery of particle electric charge dependence upon speed of a particle motion. Dissimilarities between the new space-time theory and Einstein's Special Relativity theory are considered. They are the following: 1) speed of light in vacuum dependence in a moving inertial reference frame on the speed of moving inertial reference frame motion; 2|) absence of superlight speeds prohibition; 3|) absence of time dilation; 4) availability of a particle electric charge dependence on the particle motion speed. Then the formulas of new particle dynamics are derived from new theory transformation. The experiment by Neddermeyer and Anderson in 1938 is interpreted as a confirmation of superlight speeds and dependence of electric charge upon particles speed existence in nature. It is shown that according to the NRSTT accelerated protons in the Large Hadron Collider have the energy below 400 MeV.

Key words: special relativity theory, light clock, time measurement unit, dependence of particle electrical charge upon particle speed, superlight speeds of particles, experimental confirmation of superlight speeds and existence of charge upon speed dependence.

Contents

1. Introduction

From the history of physics we know, that Newton's theory was based upon three main laws, Einstein's special relativity theory (SRT) [1] was based upon two postulates. My purpose consisted in creating the theory better than Einstein's SRT. In order to create a new theory, that can be better than some old theory I decided to use Occam's advice known as the Occam's sickle: "Things that can be explained by means of lesser arguments should not be explained by means of more arguments".

Meditating about Einstein's SRT I put a question: "How can we reduce the quantity of postulates used as a foundation of the SRT from two postulates to only one postulate?" The answer was such: our purpose could be obtained, if we could find some consequence from one of Einstein's postulates that could replace the other postulate converting it into a superfluous one. After long hesitations I decided to use the principle of relativity as the only reliable principle capable to be converted into the basis of my new space-time theory. The process of thinking resulted in a discovery that Einstein's special relativity theory basing upon two postulates is a self-contradictory theory. Such a consequence from the relativity principle is the statement about equality of time measurement units in two light clocks having identical design moving uniformly and rectilinearly each with respect the other.

2. Self-contradictoriness of Einstein's SRT and elegant elimination of this self-contradictoriness in the new space-time theory

Indeed, now it is well known that a light clock (consisting of two parallel mirrors, a photoelectric sensor on one of mirrors, a pulse counter connected to the output of the photoelectric sensor and a light pulse circulating between mirrors) is a physical system, which must comply with the relativity principle

"***The laws, by which the states of physical systems undergo change, are not affected, whether these changes of state be referred to the one or the other of two systems of co-ordinates in uniform translatory motion***".

Because the relativity principle with respect to such physical system as the light clock must read:

The laws, by which the indications of a light clock undergo change, are not affected, whether these changes of indications be referred to the one or the other of two systems of co-ordinates in uniform translatory motion.

That means that time dilation effect existing in the SRT according to the relativity principle should be absent. Indeed, if we consider that distance between mirrors of a stationary light clock is equal to $\boldsymbol{L_0}$, then the time measurement unit for a stationary light clock is equal to the value

$$T_0 = \frac{2L_0}{c_0} \tag{2.1}$$

And the time measurement unit for the same light clock, moving at the speed $\boldsymbol{V}$ in a direction perpendicular to planes of light clock mirrors, in case of an assumption that light speed in a moving light clock also is equal to $\boldsymbol{c_0}$ will be equal to the value

$$T = \frac{L}{c_0 - V} + \frac{L}{c_0 + V} \tag{2.2}$$

where $\boldsymbol{L = \frac{L_0}{\gamma} = L_0\sqrt{1 - V^2/c_0^2}}$ (2.3)

is the distance (according to the SRT) between light clock mirrors, moving at the speed $\boldsymbol{V}$.

Having substituted the equation (2.3) into the equation (2.2) and having performed all mathematical operations in it, we shall obtain instead of the formula (2.2) the equation

$$T = \frac{L}{c_0 - V} + \frac{L}{c_0 + V} = \gamma\, T_0 \tag{2.4}$$

Thus, the assumption that the light speed in a moving IRF is also equal to the same value $\boldsymbol{c_0}$, leading to the existence of time dilation effect in the SRT, leads to a contradiction with the relativity principle (indications of a light clock depend on what IRF these indications are referred to). Therefore it is expedient to explore what value of the light speed in a moving IRF will not lead to a contradiction with the relativity principle, that is to examine what value of light speed in a moving IRF will result in equality of time measurement units for stationary and moving light clocks of the precisely similar design.

In order to get rid of the detected contradiction in the SRT let us replace in the right part of the equation (2.2) instead of the Lorentz's speed V that cannot exceed the value c_0 the Galilean speed $\boldsymbol{u}$ and instead of light speed c_0 in a stationary inertial reference frame (IRF) the speed of light in the moving IRF derived in [2, p. 140]

$$w = \gamma\, c_0 = c_0^2 + u^2\,, \tag{2.5}$$

where $\gamma = \frac{1}{\sqrt{1 - V^2/c_0^2}} = \sqrt{1 + u^2/c_0^2}$ is a relativistic factor, we obtain

$$T = \frac{L}{w - u} + \frac{L}{w + u} \tag{2.6}$$

Then substituting into the equation (2.6) the expression (2.3) we obtain

$$T=\frac{L_0}{\gamma}\left(\frac{1}{w-u}+\frac{1}{w+u}\right)=\frac{L_0}{\gamma}\frac{2w}{w^2-u^2} \tag{2.7}$$

and substituting into the equation (2.7) the equation (2.5) we obtain

$$T=\frac{L_0}{\gamma}\frac{2w}{w^2-u^2}=\frac{L_0}{\gamma}\frac{2\gamma c_0}{c_0^2+u^2-u^2}=\frac{2L_0}{c_0}=T_0 \tag{2.8}$$

Thus, having refused from the second Einstein's postulate, we obtained that relativity principle becomes valid for the light clock too and the contradiction between time measurement units of stationary and moving light clocks disappears.

3. Derivation of space-time coordinates transformation of the new theory

Derivation of space-time coordinates of any events happened in a stationary primed IRF to space-time coordinates in a moving unprimed IRF we shall perform using Logunov's method [3, p. 33].

Let us consider two IRF moving each with respect the other uniformly and rectilinearly: the IRF ***A*** with unprimed space-time coordinates x, y, z, t and the IRF ***B*** with primed coordinates x', y', z', t'. Let all the clocks being at rest in the IRF ***A*** be synchronized each with other using Einstein's method by means of light sources being at rest in the same IRF ***A*** and all clocks being at rest in the IRF ***B*** be synchronized each with other using Einstein's method by means of light sources being at rest in the same IRF ***B***.

Let the IRF ***B*** with primed coordinates (x', y', z', t') be a stationary IRF and the IRF ***A*** with unprimed coordinates (x, y, z, t) be a moving IRF at the speed ***u*** in negative direction of the axis X' of the stationary IRF ***B***.

Then in the stationary IRF ***B*** the light propagates at the speed c_0 and in the moving IRF ***A*** this light propagates at the speed that is determined by an expression $c_u=c_0\sqrt{1+u^2/c_0^2}$. As a consequence an expression in Galilean coordinates of a moving IRF ***A*** has the form

$$ds^2=c_u^2dt^2-dx^2-dy^2-dz^2, \tag{3.1}$$

Let us perform over expression (3.1) the Galilean transformation

$$x''=x-ut,\quad t''=t,\quad y''=y,\quad z''=z \tag{3.2}$$

For that purpose let us write a transformation inverse to transformation (3.2)

$$x=x''+ut'',\quad t=t'',\quad y=y'',\quad z=z'', \tag{3.3}$$

where ***x, y, z, t*** are Galilean coordinates of any event in the IRF ***A***.

Having taken differentials from the both parts of equalities (3.3) and having substituted them into the expression (3.1), we have

$$\boldsymbol{ds^2 = c_0^2\left(dt''\right)^2 - 2udx''dt'' - \left(dx''\right)^2 - \left(dy''\right)^2 - \left(dz''\right)^2}. \tag{3.4}$$

In order to dispose in the right part of the expression (26) from a cross term $dx''dt''$, let us separate a perfect square in it. In the result of this operation the interval (3.4) acquires the form

$$\boldsymbol{ds^2 = c_0^2\left[dt'' - \frac{udx''}{c_0^2}\right]^2 - \frac{\left(dx''\right)^2}{1-\frac{u^2}{c_u^2}} - \left(dy''\right)^2 - \left(dz''\right)^2}, \tag{3.5}$$

Now let us introduce a new time

$$\boldsymbol{t' = t'' - \frac{ux''}{c_0^2}} \tag{3.6}$$

and new coordinates

$$x' = \frac{x''}{\sqrt{1-\frac{u^2}{c_u^2}}}, \quad y' = y'', \quad z' = z'' \tag{3.7}$$

Then the expression (3.5) for the interval in these variables will have the form

$$ds^2 = c_0^2\left(dt'\right)^2 - \left(dx'\right)^2 - \left(dy'\right)^2 - \left(dz'\right)^2 \tag{3.8}$$

But the expression (3.8) is an expression for the interval in Galilean coordinates of the stationary IRF ***B***.

Thus, having applied consequently transformation (3.2) and transformations (3.6) – (3.7) we passed from the interval (3.1) in the moving IRF ***A*** to the interval (3.8) in the stationary IRF ***B***. That means that after substitution of the expression (3.2) into expressions (3.6) and (3.7) we shall obtain transformation of coordinates and time from the moving IRF ***A*** to the stationary IRF ***B***

$$c_0t' = \gamma(c_ut - \beta x), \quad x' = \gamma(x - \beta c_ut), \quad y' = y, \quad z' = z, \tag{3.9}$$

where $\boldsymbol{\beta = \frac{u}{c_u}}$; $\gamma = \frac{1}{\sqrt{1-\beta^2}}$; $c_u = c_0\sqrt{1+\frac{u^2}{c_0^2}}$.

Having resolved transformation (3.9) with respect to unprimed coordinates, we shall have the transformation

$$c_ut = \gamma(c_0t' + \beta x'), \quad x = \gamma\left(x' + \beta c_0t'\right), \quad y = y', \quad z = z'. \tag{3.10}$$

This transformation provides transfer of space-time coordinates of any event from a stationary primed IRF to a moving unprimed IRF.

4. Dissimilarities of the new theory from Einstein’s SRT

The first essential dissimilarity of the new theory from Einstein’s SRT is the absence of the second postulate in the foundation of the new theory.

Absence of the second postulate and derivation of dependence of light speed propagation upon light source speed allowed me considering various astronomical phenomena as confirmation of existence in nature of dependence $c_u = \sqrt{c_0^2 + u^2}$. In the result of investigation of light propagation at astronomical distances by computer simulation I discovered, first of all, that such phenomena as novas and supernovas, as well as pulsars can be explained as different effects arising from movement of light from different semi-ellipses of elliptical movement of binary stars. When the binary stars move with increasing speed from apastrons to periastrons, the light quanta emitted by them during the whole semi-period at large distance from a binary star can arrive practically simultaneously (during some months) while the semi-period itself can last during some hundred or even some thousand years [4, p. 10]. When the binary stars move with decreasing speed from periastrons to apastrons, the light quanta emitted by them during the whole semi-period are seen to the remote observer as a pulsar [4, p.10].

Then the subsequent analysis of dependence $c_u = \sqrt{c_0^2 + u^2}$ has shown, that almost all effects connected with the so called "Universe expansion" can be explained by this dependence of light propagation speed upon the speed of light source motion. Among these effects we can see: Olbers's paradox, red shift of far star spectrums, microwave background radiation, object SS-433, bursts of X-rays and gamma-rays, accelerated expansion of the Universe, etc.

New effects from astronomical phenomena that now can not be explained by modern orthodox physics are luminous arcs similar to the one shown in the image from Hubble telescope: [img]https://apod.nasa.gov/apod/image/1008/irasghost_hst.jpg[/img]

Explanation to this photo from [5]:

"What's lighting up nebula IRAS 05437+2502? No one is sure. Particularly enigmatic is the bright upside-down V that defines the upper edge of this floating mountain of interstellar dust, visible near the image center. In general, this ghost-like nebula involves a small star forming region filled with dark dust that was first noted in images taken by the IRAS satellite in infrared light in 1983. Shown above is a spectacular, recently released image from the Hubble Space Telescope that, although showing many new details, has not uncovered a clear cause of the bright sharp arc. One hypothesis holds that the glowing arc was created by a massive star that somehow attained a high velocity and has now left the nebula. Small, faint IRAS 05437+2502 spans only 1/18th of a full moon toward the constellation of the Bull (Taurus)".

From point of view of the NRSTT this "bright sharp arc" is a part of elliptic trajectory of one stars from an unknown binary system, that occurred to be at such a distance from the Solar system that the ellipse is resolved and moreover the light from a part of ellipse arrived to the Hubble telescope simultaneously in such a way that it has drawn this "bright sharp arc".

The second essential dissimilarity is the absence of superlight speeds prohibition.

Indeed, the Lorentz transformations from the SRT have the form

$$c_0 \cdot t' = \frac{c_0 \cdot t - \beta \cdot x}{\sqrt{1-\beta^2}}, \quad x' = \frac{x - \beta \cdot c_0 \cdot t}{\sqrt{1-\beta^2}}, \quad y' = y, \quad z' = z\,, \tag{4.1}$$

$$c_0 \cdot t = \frac{c_0 \cdot t' + \beta \cdot x'}{\sqrt{1-\beta^2}}, \quad x = \frac{x' + \beta \cdot c_0 \cdot t'}{\sqrt{1-\beta^2}}, \quad y = y', \quad z = z'\,, \tag{4.2}$$

where V is the Lorentz speed of motion of one IRF with respect to another IRF, c_0 = 299 792 458 m/s is the speed of light in vacuum of the stationary IRF.

From Lorents's transformations (4.1), (4.2) it can be seen that Lorentz's speed of IRF motion V under the SRT can not be greater than the speed of light in vacuum c_0. Indeed, at the speed of IRF motion exceeding the speed of light in vacuum c_0 square roots in denominators of transformations (4.1), (4.2) become imaginary numbers not existing on the assemblage of real numbers.

Such a prohibition on existence of superlight speeds disappears from the new relativistic theory. Indeed, transformations (3.9), (3.10) of the new theory have the form respectively

$$x = \frac{x' + \beta c_0 t'}{\sqrt{1-\beta^2}}, \quad y = y', \quad z = z', \quad c_u t = \frac{c_0 t' + \beta x'}{\sqrt{1-\beta^2}}, \tag{4.3}$$

$$x' = \frac{x - \beta c_u t}{\sqrt{1-\beta^2}}, \quad y' = y, \quad z' = z, \quad c_0 t' = \frac{c_u t - \beta x}{\sqrt{1-\beta^2}}, \tag{4.4}$$

where $\beta = \dfrac{u}{c_u}, \quad c_u = \sqrt{c_0^2 + u^2}$ is the speed of light in vacuum of a moving IRF, c_o is the speed of light in vacuum of a stationary IRF.

From transformations (4.3), (4.4) of the new theory it is well seen, that no matter how great the IRF speed u can be, the speed of light in vacuum of the moving IRF $c_u = \sqrt{c_0^2 + u^2}$ will be greater and no imaginary numbers do appear in the new theory. Consequently, the prohibition on superlight speed of motion, existing in Einstein's SRT, in the new theory is absent.

The third dissimilarity of the new theory from Einstein's SRT consists in absence of moving light clock retardation from the stationary light clock (in absence of time dilation in the moving IRF).

In order to make oneself sure in absence of moving clock retardation, let us place the equality $x' = 0$ into the equations (5.2), considering that in the primed IRF the light clock is at rest in the point $x' = 0$.

Then as a result of such substitution we shall obtain for coordinates of the clock in the unprimed IRF at any time moment the values:

$$t = t', \quad x = u \cdot t, \quad y = y', \quad z = z'. \tag{4.5}$$

From the thirst equation we become be informed that there is no retardation of the moving clock with respect to the stationary clock.

The fourth essential dissimilarity of the new theory from Einstein's SRT consists in dependence of electric charge value of a moving body or a particle on the value of that body or particle motion speed. This dependence has the form:

$$q_u = \frac{q_0}{\gamma}, \tag{4.6}$$

where q_u is the charge of a particle, moving at the speed u;

q_0 is the charge of the stationary particle (moving at the speed $u = 0$),

$\gamma = \dfrac{1}{\sqrt{1-\beta^2}} = \sqrt{1+\dfrac{u^2}{c_0^2}}$ is the relativistic factor.

5. Dependence of Charge upon Speed

The space-time theory [6 p. 10] basing upon transformations (3.9) - (3.10) essentially differs from the Einstein's SRT. One of main essential differences of the NRSTT from the SRT consists in dependence of the moving particle electric charge upon value of this particle movement speed. This dependence has the form:

$$q_u = \frac{q_0}{\gamma}, \tag{5.1}$$

where q_u is the charge value of a particle moving at the speed *u*; q_0 is the charge value of an immovable particle ,

$$\gamma = \frac{1}{\sqrt{1-\beta^2}} = \sqrt{1+\frac{u^2}{c_0^2}}, \ \beta = \frac{u}{c_u}, \tag{5.2}$$

Really, having used in the primed stationary IRF the Maxwell's equations

$$rot'\vec{H}' = \vec{j}' + \frac{\partial \vec{D}'}{\partial t'}'; \tag{5.3.1}$$

$$div'\vec{D}' = \rho'; \tag{5.3.2}$$

$$rot'\vec{E}' = -\frac{\partial \vec{B}'}{\partial t'}'; \tag{5.3.3}$$

$$div'\vec{B}' = 0, \tag{5.3.4}$$

where $\vec{D}'$, $\vec{B}'$ are vectors of electric field induction and magnetic field induction in the primed stationary IRF; $\vec{E}'$, $\vec{H}'$ are vectors electric field strength and magnetic field strength in the primed stationary IRF; ρ' is the electric charge density in the primed stationary IRF, $\vec{j}'$ is the vector of current density in the primed stationary IRF,
the transformations (3.9) – (3.10), we shall obtain Maxwell's equations in unprimed moving IRF

$$rot\vec{H} = \vec{j} + \frac{\partial \vec{D}}{\partial t}; \tag{5.4.1}$$

$$div\vec{D} = \rho; \tag{5.4.2}$$

$$rot\vec{E} = -\frac{\partial \vec{B}}{\partial t}; \tag{5.4.3}$$

$$div\vec{B} = 0, \tag{5.4.4}$$

where $\vec{D}$, $\vec{B}$ are vectors of electric field inductance and magnetic field inductance in unprimed moving IFR; $\vec{E}$, $\vec{H}$ are vectors of electric field strength and magnetic field strength in unprimed moving IRF , ρ is the density of electric charge in the unprimed moving IRF; $\vec{j}$ is the current density vector in the unprimed IRF, and between field parameters in two IRF moving each with respect the other there are the following dependences:

$$c_u D_x = c_0 D'_{x'}; \tag{5.5.1}$$

$$c_u D_y = \gamma\left(c_0 D'_{y'} + \beta H'_{z'}\right); \tag{5.5.2}$$

$$c_u D_z = \gamma\left(c_0 D'_{z'} - \beta H'_{y'}\right); \tag{5.5.3}$$

$$E_x = E'_{x'} \tag{5.5.4}$$

$$E_y = \gamma\left(E'_{y'} + \beta c_0 B'_{z'}\right); \tag{5.5.5}$$

$$E_z = \gamma\left(E'_{z'} - \beta c_0 B'_{y'}\right); \qquad \text{-(5.5.6)}$$

$$c_u B_x = c_0 B'_{x'}; \tag{5.5.7}$$

$$c_u B_y = \gamma\left(c_0 B'_{y'} - \beta E'_{z'}\right); \tag{5.5.8}$$

$$c_u B_z = \gamma\left(c_0 B'_{z'} + \beta E'_{y'}\right); \tag{5.5.9}$$

$$c_u \rho = \gamma\left(c_0 \rho' + \beta j'_{x'}\right); \tag{5.5.10}$$

$$j_x = \gamma\left(j'_{x'} + \beta c_0 \rho'\right); \tag{5.5.11}$$

$$j_y = j'_{y'}; \tag{5.5.12}$$

$$j_z = j'_{z'}, \tag{5.5.13}$$

where $\beta = \frac{u}{c_u}, \gamma = \frac{1}{\sqrt{1-\beta^2}}$.

From the expression (5.5.10) at $\boldsymbol{j}'_{\boldsymbol{x}} = 0$ we shall have

$$\rho = \rho', \tag{5.6}$$

i.e. according to the NRSTT at absence of longitudinal current in a stationary primed IRF the electric charge density is an invariant value.

But the electric charge densities in two IRF moving each with respect the other uniformly and rectilinearly at absence of longitudinal current in the stationary IRF are determined by the expressions

$$\rho = \frac{q_u}{\Omega_u};\ \rho' = \frac{q_0}{\Omega_0}, \tag{5.7}$$

where q_u is the value of a charge moving at the speed u; q_0 is the value of a stationary charge; Ω_0 is the volume of the charge in a stationary IRF;

$$\Omega_u = \frac{\Omega_0}{\gamma} \tag{5.8}$$

is the volume occupied by the charge in a moving IRF.

Having substituted now formulas (5.7) and (5.8) into the formula (5.6) we shall have the formula of charge dependence upon speed in the new relativistic space-time theory in the form

$$q_u = \frac{q_0}{\gamma} \tag{5.9}$$

that coincides with the formula (5.1) at

$$\gamma = \frac{1}{\sqrt{1-\beta^2}} = \sqrt{1+\frac{u^2}{c_0^2}}. \tag{5.10}$$

Thus, in the NRSTT the more is the speed of a charged particle, the less is its electric charge.

6. New relativistic particle dynamics

Let us consider an elementary particle with electrical charge e_0 and invariant mass m at a certain time moment resting in the primed inertial reference frame (IRF) B, that is moving at a

Galilean speed u in the positive direction of the axis X of unprimed IRF A. Let this particle be in the electromagnetic field, which source is at rest in the IRF B. Then we can suppose that motion of this particle in the IRF B takes place further in accordance with equations

$$
\begin{aligned}
m\frac{d^2x'}{dt'^2} &= e_0 E_{x'}{}';\\
m\frac{d^2y'}{dt'^2} &= e_0 E_{y'}{}';\\
m\frac{d^2z'}{dt'^2} &= e_0 E_{z'}{}';
\end{aligned} \tag{6.1}
$$

where

$$
\begin{aligned}
E_{x'}{}' &= E_x;\\
E_{y'}{}' &= \gamma(E_y - \beta c_0 B_z);\\
E_{z'}{}' &= \gamma(E_z + \beta c_0 B_y);
\end{aligned} \tag{6.2}
$$

$E_{x'}{}'$, $E_{y'}{}'$, $E_{z'}{}'$ are the components of the electric field strength vector, acting onto this elementary particle, being at rest in the IRF B; E_x, E_y, E_z, B_y, B_z are components of the electric field vector and the magnetic field inductance vector, measured in the IRF A – in that point of the IRF A, in which the particle under consideration is situated in any given time moment.

At that expressions (6.2) are obtained similarly to equation (5.5.4), (5.5.5) and (5.5.6) for electromagnetic field, which source is at rest in the unprimed IRF.

Having substituted expressions (6.2) into equations (6.1), we obtain

$$
\begin{aligned}
m\frac{d^2x'}{dt'^2} &= e_0 E_x;\\
m\frac{d^2y'}{dt'^2} &= e_0\gamma(E_y - \beta c_0 B_z);\\
m\frac{d^2z'}{dt'^2} &= e_0\gamma(E_z + \beta c_0 B_y);
\end{aligned} \tag{6.3}
$$

In the right parts of equations (6.1) and (6.3) the forces are placed, acting on the elementary particle with a charge e_0, which is at rest in the IRF B. Therefore in these equations the formula of charge dependence upon speed is not used. At that in the right parts of equations (6.3) the forces acting on the particle in the IRF B are expressed using components of electromagnetic field vectors measured in the IRF A.

Let us express the left parts of equations (6.3) using coordinates and time measured in IRF A. For that purpose let us use transformation (4.4) from section 4 (as we consider events, taking place in the stationary IRF B):

$$
c_0 \cdot t' = \gamma\cdot(c_u \cdot t - \beta\cdot x), \quad x' = \gamma\cdot(x - \beta\cdot c_u\cdot t), \quad y' = y, \quad z' = z, \tag{4.4}
$$

where $\beta = \frac{u}{c_u}$, $\gamma = \frac{1}{\sqrt{1-\beta^2}}$, $c_u = \sqrt{c_0^2 + u^2}$.

Having twice differentiated each of two first equations of transformation (4.4) by time t' and having substituted into the resulting expressions (after differentiation) the values

$$dx/dt = u, \quad dy/dt = 0, \quad dz/dt = 0,$$

we have

$$\frac{d^2x'}{dt'^2} = \gamma \cdot \frac{d^2x}{dt^2}; \quad \frac{d^2y'}{dt'^2} = \frac{d^2y}{dt^2}; \quad \frac{d^2z'}{dt'^2} = \frac{d^2z}{dt^2}. \tag{6.4}$$

Now let us substitute expressions (6.4) into left parts of equations (6.3). We shall obtain instead of (6.3)

$$m\gamma\frac{d^2x}{dt^2} = e_0E_x; \quad m\frac{d^2y}{dt^2} = e_0\gamma(E_y - \beta c_0 B_z); \quad m\frac{d^2z}{dt^2} = e_0\gamma(E_z + \beta c_0 B_y); \tag{6.5}$$

where, as before,

$$\beta = \frac{u}{c_u}, \qquad \gamma = \frac{1}{\sqrt{1-\beta^2}}, \qquad c_u = \sqrt{c_0{}^2 + u^2},$$

If E_z and B_y are the only components of the electromagnetic field not equal to zero, then from expressions (6.5) only the last one will remain

$$\frac{d^2z}{dt^2} = \frac{e_0\,\gamma}{m}(E_z + \beta\, c_0\, B_y); \tag{6.6}$$

Bending of the particle motion trajectory under action of this deflection field takes place in the plane xz and trajectory curvature radius R can be determined from the formula

$$\frac{u^2}{R} = \frac{d^2z}{dt^2}. \tag{6.7}$$

If only the magnetic field with inductance B_y is present, from equations (6.6) and (6.7) we shall obtain an expression for particle trajectory curvature radius in the transversal magnetic field

$$R_M = \frac{m\,u}{e_0\,B_y}. \tag{6.8}$$

If only the electric field with the strength E_z is present, from equations (6.6) and (6.7) we shall obtain an expression for the particle trajectory curvature radius in the transversal electric field

$$R_E = \frac{m\,u^2}{e_0\,\gamma\,E_z}\,. \tag{6.9}$$

In the special relativity theory (SRT) the analogs for formulas (6.8) and (6.9) will be the formulas

$$R_M^{SRT} = \frac{m\,V}{e_0\,B_y\,\sqrt{1-V^2/c_0^2}}., \tag{6.10}$$

$$R_E^{SRT} = \frac{m\,V^2}{e_0\,E_z\,\sqrt{1-V^2/c_0^2}}, \tag{6.11}$$

where V is the particle motion speed in accordance with the SRT, not exceeding the constant c_0.

From expressions (6.8) and (6.9) we obtain

$$\frac{R_E}{R_M} = \frac{B_y}{E_z}\frac{u}{\sqrt{1+u^2/c_0^2}}\,. \tag{6.12}$$

And from expressions (6.10) and (6.11) we obtain

$$\frac{R_E^{SRT}}{R_M^{SRT}} = \frac{B_y}{E_z} V \quad . \tag{6.13}$$

The formula (6.12) from the new space-time theory coincides with the formula (6.13) from the SRT, if between "*V*-speed" from the SRT and "*u*-speed" from the new theory the following dependence exists

$$V = \frac{u}{\sqrt{1 + u^2 / c_0^2}} \cdot \tag{6.14}$$

If only the longitudinal electric field with the strength E_x is present, then from equations (6.5) only the first expression will remain, that could be rewritten in the form

$$m\, c_0^2\, \gamma^3\, \frac{d^2 x}{d(c_u\, t)^2} = e_0\, E_x \cdot \tag{6.15}$$

Let the particle with the charge e_0 and the mass m is initially at rest in the coordinates origin of the IRF A. At a certain time moment an accelerating electrostatic field becomes acting, which source is at rest in the IRF A, and at that the vector of electrostatic field acting upon the particle is parallel to the axis X of the IRF A. Then on the infinitesimally small section of path dx, within which the particle acceleration can be considered constant, the particle will take from the electrostatic field the energy

$$dW = e_0\, E_x\, dx\, . \tag{6.16}$$

Having substituted into the right part of the expression (6.16) instead of the expression $e_0\, E_x$ an expression from equation (6.15) equal to it, then we shall obtain

$$dW = m\, c_0^2\, \gamma^3\, \frac{d^2 x}{c_u^2 \cdot dt^2}\, dx \quad \cdot \tag{6.17}$$

But in the expression (6.17) it is possible to perform the following transformations, considering the value c_u as a constant one

$$\frac{d^2 x}{c_u^2 \cdot dt^2} \cdot dx = \frac{d\left(\frac{dx}{dt}\right)}{c_u^2 \cdot dt} \cdot dx = \frac{1}{c_u^2}\, \frac{dx}{dt}\, d\left(\frac{dx}{dt}\right) = \frac{1}{c_u^2}\, u\, du = \beta\, d\beta \quad , \tag{6.18}$$

where $\beta = u / c_u$. That is why the expression (6.16) can be written in the form

$$dW = m\, c_0^2\, \gamma^3\, \beta\, d\beta \quad . \tag{6.19}$$

The full energy, taken by the particle from the electrostatic field and converted into the kinetic energy of the particle, we can obtain if we shall perform integrationof the expression (6.19) within the limits from zero to β

$$W = \int_0^{\beta} m\, c_0^2\, \gamma^3\, \beta\, d\beta \cdot \tag{6.20}$$

Having performed the integration, we obtain

$$W = m\,c_0^2 \left(\frac{1}{\sqrt{1-\beta^2}} - 1 \right) . \qquad (6.21)$$

The dependence (6.21) appearance of the particle kinetic energy upon the speed of its motion in the new space-time theory coincides with the similar dependence from the SRT. But in the formula (6.21) of the new theory the value β is determined by the formula

$$\beta = \frac{u}{c_u} = \frac{u / c_0}{\sqrt{1+u^2/c_0^2}} , \qquad (6.22)$$

while in the SRT the same value β is determined by the formula

$$\beta = \frac{V}{c_0} . \qquad (6.23)$$

Though, if we shall insert the expression (6.14) into the formula (6.23), we shall obtain the formula (6.22). Consequently, taking into account the formula (6.14) the dependence (6.21) of particle kinetic energy upon motion speed in the new space-time theory coincides with the similar dependence from the SRT. But having substituted the formula (6.22) into the formula (6.21), we obtain

$$W = m\,c_0^2 \left(\sqrt{1+u^2/c_0^2} - 1 \right) . \qquad (6.24)$$

Then, if we as earlier shall consider, that

$$E_0 = m\,c_0^2 \qquad (6.25)$$

is the rest energy of the particle, then the formula (6.24) can be interpreted as a difference between the full particle energy

$$E = m\,c_0^2\,\sqrt{1+u^2/c_0^2} \qquad (6.26)$$

and rest energy of the particle (6.25).

After squaring the both parts of the equation (6.26) we obtain the expression

$$E^2 = m^2\,c_0^4 + m^2\,u^2\,c_0^2 , \qquad (6.27)$$

which can be considered as a relation between the full energy of the particle and its momentum in the new space-time theory

$$E^2 = m^2\,c_0^4 + p^2\,c_0^2 , \qquad (6.28)$$

where $$p = m\,u$$

(6.29)

is the particle momentum in the new space-time theory.

Having substituted into the formula (6.29) the expression $u = \dfrac{V}{\sqrt{1-V^2/c_0^2}}$, which can be obtained if we shall solve the equation (6.14) with respect to the value ***u***, we obtain the formula

$$p = \frac{m\,V}{\sqrt{1 - V^2 / c_0^2}}\ , \qquad (6.30)$$

which determines the particle momentum in the SRT.

Having solved the expression (6.24) with respect to the particle speed, we obtain dependence of the particle speed upon its kinetic energy in the new space-time theory

$$\frac{u}{c_0} = \sqrt{\left(\frac{W}{mc_0^2} + 1\right)^2 - 1}\,. \qquad (6.31)$$

From this formula it follows that if the particle kinetic energy exceeds 42% from its rest energy, then such a particle must move at a superlight speed.

Having submitted the formula (6.31) into the formula (6.8), we obtain dependence of charged particle radius of curvature in the transversal magnetic field upon kinetic energy of the particle, which is valid in the new space-time theory

$$R_M = \frac{m\,c_0^2}{e_0\ B_y}\sqrt{\left(\frac{W}{m\,c_0^2} + 1\right)^2 - 1}\,. \qquad (6.32)$$

This dependence coincides completely with the similar dependence from the SRT – the dependence, determining operation of the cyclic particle accelerators. The dependence (6.32) can be also converted to a form

$$R_M = \frac{\sqrt{W\ (W + 2\ E_0)}}{c_0\ e_0\ B_y}\,. \qquad (6.33)$$

Thus, from the new space-time theory it follows, that if the kinetic energy of the particle exceeds 42% from the rest energy of the particle, then the particle moves at the superlight speed.

But in modern particle accelerators we long ago have encountered with particle kinetic energies, sufficiently exceeding the particles rest energies. And, nevertheless, superlight speeds in experiments on particle accelerators are not detected till now. This fact can be considered as the basis for statement that new space-time theory is not confirmed by operation of modern particle accelerators. But before we shall agree with these statement, let us clarify, whether we really do not detect superlight speeds on particle accelerators, or we do not wish to see them because these superlight speeds are prohibited by the SRT.

7. How the mountain has brought forth a mouse

Now let us consider the consequences of the formula (6.31) on the operation of the Large Hadron Collider (LHC). The appearance of this formula is such

$$\frac{u}{c_0} = \sqrt{\left(\frac{W}{mc_0^2} + 1\right)^2 - 1} \qquad (7.1)$$

The rest energy of an electron is equal to approximately 0.511 MeV, and the rest energy of a proton is approximately equal to 938 MeV. According to the formula (7.1) if an electron has a kinetic energy greater than 0.42×0.511 MeV = 0.22 MeV it moves at a superlight speed. And a proton moves at a superlight speed, if its kinetic energy is greater than 0.42×938 MeV = 394 MeV =3.94 10^8 eV.

But it is declared now that kinetic energy of protons in the LHC is equal to approximately W = 7 TeV = 7 10^{12} eV.

Let us determine using the formula (7.1) with what speed must the proton move in order to have the kinetic energy of 7 TeV. If W=7 TeV, mc^2=394 MeV, we shall obtain from the formula (7.1) the value $\frac{u}{c_0} \approx 7464$.

Who is a liar, the author of this article or every of todays (I don’t dare saying ”modern”) physicists, who believe that the speed of any proton in the LHC does not exceed the speed of light in vacuum of a stationary IRF?

Let us solve the equation (7.1) with respect to a ratio of the particle kinetic energy to the particle rest energy. We shall obtain the formula

$$\frac{W}{m\,c_0^2} = \sqrt{1 + \frac{u^2}{c_0^2}} - 1 \tag{7.2}$$

Both from (7.1) and from (7.2) it follows that approximate equation between the values W/mc_0^2 and u/c_0 is such

$$\frac{W}{m\,c_0^2} \approx \frac{u}{c_0} \tag{7.3}$$

But if the modern physics strives to accelerate the protons to the speed of light c_0, but not to exceed it (that is impossible in accordance with Einstein’s SRT), then according to the exact formula (7.2) the proton kinetic energy in this case will not exceed the value of 0.414×E_0 < 400 MeV.

Thus, the proton beam in the LHC greatest circular accelerator with circumference length equal approximately to 27 km exists during approximately some tens of hours. Protons in this beam move at the speed approximately equal to the speed of light in vacuum c_0 having kinetic energy not greater than 400 MeV at any time moment. Then what great discoveries can be made on such an accelerator? In this case we can say “The mountain LHC has brought forth a mouse (a proton)” with kinetic energy not exceeding 400 MeV. The declared kinetic energy of any of accelerated protons in LHC is equal to 7 TeV, but real kinetic energy of any of accelerated protons does not exceed the energy of 400 MeV. So, it is a greatest lie in the history, that any proton in the LHC after its acceleration is equal to 7 TeV.

8. Experiment by Neddermeyer and Anderson in 1938 as a grandiose confirmation of superlight speeds and dependence of charge upon speed existence in nature

It is considered now that in the article by Neddermeyer S.H., Anderson C.D. titled “Cosmic-ray particles of intermediate mass”. // Physical Review. 1938. [7, p.88] the particles were discovered with mass intermediate between the mass of a proton and a mass of an electron. In experiments with Wilson chamber placed in the magnetic field described in this article of 1938, its authors showed, that high-energy particles from consist of space particles penetrated through considerably large layers of heavy substance (plumbum, platinum, copper), losing the energy only on ionization of substance atoms. Identification of these particles, having high penetration capability, with protons, which mass was by a factor of 1936 times greater than the mass of electron, seemed to be impossible. Because if the particle had the mass of a proton, then its speed calculated on the curvature radius of the particle trajectory in the transversal magnetic field, should result in such ionization of gas along the particle trajectory in Wilson chamber, that tenfold times was greater than the ionization really observed in experiments.

On the other hand, it was impossible to identify these particles, having high penetration capability, before appearance of the new space-time theory, discussed in this article, with electrons. Because from theoretical calculations based upon the SRT, it followed that high-energy electrons should loose the major part of their energy on braking radiation. But the particles possessing high penetration capability should not have noticeable losses of energy on braking radiation (otherwise they should not possess high penetration capability).

In the new relativistic space-time theory there is an alternative approach to solving a problem of muon-electron universality. This approach is based upon the property of an electric charge dependence upon speed, existing in the NRSTT. This dependence has the form (see section 4)

$$e_u = \frac{e_0}{\gamma}, \tag{8.1}$$

where e_0 is a charge of a stationary particle;

e_u is a charge of a particle moving at a speed u;

$\gamma = \frac{1}{\sqrt{1-\beta^2}} = \sqrt{1+\frac{u^2}{c_0^2}}$ is the relativistic factor

u is the speed of a particle motion.

Indeed, in the new relativistic space-time theory the formula for losses of particle energy on braking radiation (bremsstrahlung radiation) taking into account the minimal value of impact parameter resulting from quantum theory has the form

$$-\frac{dE}{dx}=\frac{\pi\ N\left(z\,e_0\right)^2 e_u^4}{3\,E_0\,\hbar\left(\dfrac{u}{c_0}\right)}\,, \tag{8.2}$$

˜ where dE/dx are losses of a particle energy along 1 cm of the path through some substance because of braking (bremsstrahlung) radiation during its motion through some substance;

N is the number of atomic nuclei in 1 cm^3 of substance;

ze_0 is the charge of one atomic nucleus (z is number of protons in one atomic nucleus);

$\boldsymbol{E_0 = mc_0^2}$ is the energy of one resting particle emitting the breaking radiation;

m is an invariant mass of that particle;

$\hbar$ is the Plank's constant;

u is the Galilean speed of a particle motion;

q_u is the charge of a particle moving at the speed u included in the formula (8.1);

c_0 is the speed of light in vacuum of immovable IRF.

If a particle moves at a very high superlight speed (if $u >> c_0$ from the formula (8.1) we have

$$\boldsymbol{e_u \approx e_0 / (u / c_0)} \tag{8.3}$$

Then having substituted the expression (8.3) into the formula (8.2), we shall obtain the formula

$$-\frac{dE}{dx}=\frac{\pi\ N\ z^2\ e_0{}^2 e_0^6}{3\,E_0\,\hbar\left(\dfrac{u}{c_0}\right)^5}\,, \tag{8.4}$$

in accordance with which at increase of the superlight speed of a particle motion by one order (at 10 times increase) the particle losses because of braking radiation will decrease by five orders (decrease by 10^5 times). As a consequence of such a formula the braking radiation for high energy positrons or electrons (moving at speeds sufficiently exceeding the speed of light in vacuum of a stationary IRF $\boldsymbol{c_0}$) becomes considerably lesser, than the braking radiation of low energy electrons. This allows identifying cosmic ray particles in K. Anderson and S. Nedderamyer experiment in 1938 [7, p.88] having high penetration capability as high-energy positrons and as experimental confirmation of particle movement at superlight speeds.

For example, as in accordance with the NRSTT the speed of an electron or a positron can be determined using the formula,

$$\frac{u}{c_0}=\frac{BR\,e_0}{m\,c_0} \tag{8.5}$$

where $\boldsymbol{B}$ is the magnetic field inductance, $\boldsymbol{R}$ is the radius of a positron trajectory, the speed of a positron in the upper part of a photographic picture shown in the article [7, p. 88] is 100 times greater than the light speed $\boldsymbol{c_0}$, and the positron speed in the lower part of this picture is 14 times greater than the speed of light $\boldsymbol{c_0}$.

9. Conclusions

The results of my research in the field of creating a new space-time theory basing upon not two, but only one principle are as follows.

1. Einstein's second postulate (independence of light speed upon speed of light source) comes into a contradiction with the relativity postulate, the most evident argument in support of this statement is non-equality of time measurement units of a moving light clock (MLC) and a stationary light clock (SLC) having identical design. It is well seen from the formula for MLC time measurement unit $T_{MLC} = \frac{L_0}{\gamma}\left(\frac{1}{c_0 - V} + \frac{1}{c_0 + V}\right) = \gamma\, T_{SLC}$, where $\gamma = \frac{1}{\sqrt{1 - V^2/c_0^2}}$ is a Lorentz factor; $T_{SLC} = \frac{2\,L_0}{c_0}$; L_0 is a distance between parallel mirrors of the stationary light clock; V is the Lorentzian speed of motion that cannot exceed the value of speed of light in vacuum of a stationary IRF c_0 = 299 792 458 m/s. Namely this inequality ($T_{MLC} \neq T_{SLC}$) is the physical cause of time dilation effect in Einstein's SRT.

2. A new relativistic space-time theory (NRSTT) basing upon only one relativity postulate can be created. In this new space-time theory the equality $T_{MLC} = T_{SLC}$ is provided by means of introduction into the theory of the new concept "speed of light in vacuum of a moving IRF" that is defined according to the formula $c_u = \sqrt{c_0^2 + u^2}$, where u is the Galilean speed of motion that can vary from zero to infinity. The equality of time measurement units in the MLC and the SLC is provided because of equalities $c_u = \gamma\, c_0$, $c_u^2 - u^2 = c_0^2$ and $\gamma = \frac{1}{\sqrt{1 - V^2/c_0^2}} = \sqrt{1 + u^2/c_0^2}$ providing the validity of such consequence of equalities

$$T_{MLC} = \frac{L_0}{\gamma}\left(\frac{1}{c_u - u} + \frac{1}{c_u + u}\right) = \frac{L_0}{\gamma}\,\frac{2c_u}{c_u^2 - u^2} = \frac{L_0}{\gamma}\,\frac{2\,\gamma\, c_o}{c_0^2 + u^2 - u^2} = T_{SLC}\,.$$

3. The formulas for connection between Galilean and Lorentzian speeds of motion have the forms $u = \frac{V}{\sqrt{1 - \frac{V^2}{c_0^2}}}$, $V = \frac{u}{\sqrt{1 + \frac{u^2}{c_0^2}}}$.

4. The space-time coordinates transformation in the new theory has the form

$$c_u t = \frac{c_0 t' + \beta x'}{\sqrt{1-\beta^2}}, \quad x = \frac{x' + \beta c_0 t'}{\sqrt{1-\beta^2}}, \quad y = y', \quad z = z',$$

where $\beta = \frac{u}{c_u}$, $c_u = \sqrt{c_0^2 + u^2}$. The superlight speeds of bodies and particles are not forbidden in the NRSTT because relativistic roots in the denominators of transformations never can become imaginary numbers.

Having put a clock in the point $x' = 0$ of the primed IRF and substituting this equality $x' = 0$ into equations $c_u t = \frac{c_0 t' + \beta x'}{\sqrt{1-\beta^2}}$, $x = \frac{x' + \beta c_0 t'}{\sqrt{1-\beta^2}}$ we shall obtain the equations $t = t', \quad x = u \cdot t,$ from which it is well seen that time dilation is absent in the NRSTT.

5. Having applied transformations of the NRSTT to Maxwell's equation we shall obtain that in the NRSTT there is the dependence of moving particle electric charge upon its speed of motion in the form $q_u = \frac{q_0}{\gamma}$, where q_u is the electric charge of a particle, moving at the speed u ; q_0 is the electric charge of the stationary particle, $\gamma = \frac{1}{\sqrt{1-\beta^2}} = \sqrt{1 + \frac{u^2}{c_0^2}}$ is the relativistic factor.

6. The dependence of any particle speed upon the kinetic energy of that particle in the NRSTT has the form $\frac{u}{c_0} = \sqrt{\left(\frac{W}{mc_0^2} + 1\right)^2 - 1}$, where $\boldsymbol{W}$ is the particle kinetic energy. From this formula it follows that if kinetic energy of the particle exceeds 42% of its rest energy $\boldsymbol{E_0 = m\, c_0^2}$, then this particle moves at a superlight speed.

7. The dependence (6.32) of charged particle radius upon kinetic energy of the particle in the NRSTT $R_M = \frac{m\, c_0^2}{e_0\, B_y} \sqrt{\left(\frac{W}{m\, c_0^2} + 1\right)^2 - 1}$ coincides with the same dependence in Einstein's SRT. Therefore operation of cyclic particle accelerators is well described both by the SRT and the NRSTT.

8. Because of Einstein's prohibition of superlight speeds in the SRT the statement of this research about movement of high-energy particles at superlight speeds seems to be a lie of an amateur. But future can confirm this statement and the earlier this statement will be tested in practice, the earlier it will become clear, who now is a scientific researcher and who is a freak or an idiot.

9. If superlight speeds of high-energy particles exist in nature then many of physical experiments performed in past years must be reinterpreted from point of view ob the NRSTT.

10. The experiment by Neddermayer S.H. and Anderson C.D. [7, p. 88] is the first experiment from physics history, which should be reinterpreted.

11. In accordance with the formula (7.1) from the NRSTT having the form $\frac{u}{c_0} = \sqrt{\left(\frac{W}{mc_0^2}+1\right)^2 - 1}$ any particle with kinetic energy W > 394 MeV moves at a speed greater than $\boldsymbol{c_0}$. But now Einstein's SRT is considered to be true and in all particle accelerators (in LHC too) physicists strive to accelerate particles not to superlight speeds (which are considered to be untiscientifical) but only to the speed, which value does not exceed the speed of light in vacuum of a stationary IRF $\boldsymbol{c_0}$. And as according to the NRSTT a proton moving at a speed equal to $\boldsymbol{c_0}$ has the kinetic energy equal only to the value 394 MeV, then we must consider that statement about achieving by accelerated in LHC protons the energy of 7 TeV is a simple lie.

The physical cause of such lie consists in the fact that now all physicists consider the Lorentzian speed $\boldsymbol{V}$ of particles motion, which is included in the Lorentz transformation, as a physically measured speed. In accordance with the NRSTT the real physically measured speed is equal to Galilean speed $\boldsymbol{u}$ connected with the Lorentzian speed by the equations $\boldsymbol{u = \frac{V}{\sqrt{1 - \frac{V^2}{c_0^2}}}}$, $\boldsymbol{V = \frac{u}{\sqrt{1 + \frac{u^2}{c_0^2}}}}$, where $\boldsymbol{u}$ is the Galilean speed of motion, $\boldsymbol{V}$ is the Lorentzian speed of motion.

12. In connection with the fact that Einstein's SRT is a self-contradictory theory (it was shown also here [8, p. 91]) and is an anti-scientific one, it is necessary to perform re-appreciation of all experiments made during latest 110 years and to cancel study of Einstein's theories (as erroneous) in schools and universities.

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