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REGARDING THE ERRONEOUS CONCLUSION ABOUT TIME OF THE SPECIAL THEORY

Alexandar Nikolov

e-mail: almihnik@mail.bg

ABSTRACT

We will show exactly where and how the Special Theory makes a mistake as regards the time (directly in the original article). Also we are going to present a scientifically consistent approach to finding the required relations **t'/t**, based on the solution to the end of the Lorentz transformations between the inertial systems **K** and **K'** (we accept that the source of light **K'** is moving in relation to **K** with velocity **v** on the axes **X'≡X** and replacing $b=(1-v^2/c^2)^{1/2}$). Here is the solution itself: The appearance of the transformations $t'=1/b(t-v.x/c^2)$ suggests that the mathematical operation in brackets is not bringed to the end. The values $v.x/c^2=\Delta t$ are manifestly corrections to the time **t**, caused by transposition of the systems and the top speed of light. As a result $(t-\Delta t)=t_{cor}$ is the corrected time **t**, which leads to the conclusion $t'=t_{cor}/b$, i.e. **t'=t/b** and **t=t'.b** – with the increasing velocity, second **K'** is shortened and time **K'** accelerates. With top speed **c**, mathematical properly **dt'** (second prim) tends to zero.

Keywords: special theory, inertial systems, Lorentz transformations, time.

EXPOSITION

One of the erroneous conclusions of the Theory is the one regarding time. In order to show how this conclusion is drawn, first we have to pay attention to the complete formulation that the Lorentz transformations are derived from, namely:

Inertial system **K'(x', t')** is moving to the right towards a stationary system **K(x, t)** with velocity **v** along the axes **X'≡X**. At the time of concurrence of the origins **O'≡O**, from this common center a light signal is radiated to the right along **X'≡X**. After a time **t** in **K**, respectively **t'** in **K'**, the front of the signal will have a coordinate **x**, respectively **x'** in **K'**. The ratios **x'/x** и **t'/t** are wanted (we replace $b=(1-v^2/c^2)^{1/2}$).

We emphasize heavily that this is the only condition that leads to the dependencies:

$x'=1/b(x-vt)$; $t'=1/b(t-v.x/c^2)$ – viewpoint **K'** (1T)

Let us explain: As seen from the scheme, for the juxtaposition (1T) are needed two clocks, in **K** and **K'**, and the "light signal" event whose parameters **x**, **x'** and **t**, **t'** are registered (the other possibility is with three clocks – results from the first one, the signal is in implicit form).

As a second responsible moment, in order to no room for speculations, verbatim we will quote the text about the time from the original article (A. Einstein – On the Electrodynamics of Moving Bodies, 1905, part I, §4, http://www.fourmilab.ch/etexts/einstein/specrel/www/), where for convenience we will use the above designation of the systems only and we will also add some notes in italic. And here are the author's reasonings:

"Further, we imagine one of the clocks which are qualified to mark the time **t** when at rest relatively to the stationary system **K**, and the time **t'** when at rest relatively to the moving system, to be located at the origin of the co-ordinates of **K'**, and so adjusted that it marks the time **t'** (*this design eliminates the light signal*). What is the rate of this clock, when viewed from the stationary system (*no way to establish with two clocks only*)?

Between the quantities **x**, **t**, **t'**, which refer to the position of the clock, we have, evidently,

t'=1/b(t-v.x/c^2) (*the formula is **1T** – here **x** is the abscissa in **K** of the light signal*)

and **x=vt** (*here **x** is the abscissa in **K** of the origin **O'***)

Therefore, **t'=t.b** whence it follows that the time marked by the clock (viewed in the stationary system) is slow…"

In a word, Einstein arrives at the conclusion **t'=t.b**, putting **x=vt** at the place of **x** in relation (1T). However, it is obvious that the two abscissas are not equivalent. Before us is a wrongful manipulation of formula (1T). According to the initial treatment it compares the light signal's parameters **x**, **t**, **t'**. While in the scenario of the quoted text this event is discarded. But with his falling off, drop out and the top speed **c**, coordinate **x'** and time **t'**. Then, the times **t'** and **t** of which event does the author compare...and how does he compare them once formulas (1T) do not make sense anymore?

In order to show even more clearly the whole untenability of his reasonings at this point we will adapt the problematic treatment to the initial one by replacing the light signal with a conditional one* whose velocity is **v**. I.e., in system **K'** the front of the signal does not leave the origin **O'** and therefore it has a coordinate **x'=0** and time **t'=0**. And in system **K**, after the time **t**, it will have a coordinate **x**. So the situation is adjusted to transformations (1T), with a result:

0=x-vt , respectively **x=vt** ; **0=t-x/v** , respectively **t=x/v** (1T*)

Therefore, the author's idea of **x=vt** will be in force only when **x'=0**, **t'=0**, which makes the conception a classical one – the ongoing event in **K** is the movement of **K'**, ergo, the conditional signal with its front in **O'**. Nothing more! In this case, one cannot draw a conclusion about the relation **t'/t**…besides in the way of incorrect physical and mathematical operations (the light signal is the heart of the Theory).

While here, we are going to present a scientifically consistent approach to finding the required relations, based on strict adherence to the inicial formulation, with solution to the end of the transformations derived from it (http://alniko.log.bg/article.php?article_id=78196):

In short, because of displacement of the systems **K** and **K'**, reports **x'**, **t'** in **K'** are mono-dimensional ($x'=x'_{mon}$, $t'=t'_{mon}$), while reports **x**, **t** in **K** are formed as summary ($x=x_{sum}$, $t=t_{sum}$). I.e., the exact description of transformations (1T) is:

$x'_{mon}=1/b(x_{sum}-vt_{sum})$; $t'_{mon}=1/b(t_{sum}-v.x_{sum}/c^2)$ – viewpoint **K'** (1T)

Now we must to solve the expressions in brackets. The coordinate x_{sum} consists of mono-dimensional coordinate x_{mon} (corresponding to x'_{mon}) and the additional distance $v.t_{sum}$=**OO'**, i.e. $x_{sum}=x_{mon}+v.t_{sum}$. The time t_{sum} consists of mono-dimensional time t_{mon} (corresponding to t'_{mon}) and a time supplement $v.x_{sum}/c^2$ for distance **OO'**, i.e. $t_{sum}=t_{mon}+v.x_{sum}/c^2$. The substitution of the summary quantities leads to the correct direct comparison:

$x'_{mon}=x_{mon}/b$; $t'_{mon}=t_{mon}/b$ (as a generalization $x'=x/b$; $t'=t/b$) – viewpoint **K'** (1T)

$x_{mon}=x'_{mon}.b$; $t_{mon}=t'_{mon}.b$ (as a generalization $x=x'.b$; $t=t'.b$) – viewpoint **K** (2)

(the effect of the movement is reported without displacement of the systems (**O'=O**))

The conclusion is: With the increasing velocity, second **K'** is shortened and time **K'** accelerates. With top speed **c**, mathematical properly **dt'** (second prim) tends to zero (as well as **dx' -** meter prim).