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Proven Error's in "On the Electrodynamics of Moving Bodies"

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I found mistakes in Einstein's original paper on special relativity, "**On the Electrodynamics of Moving Bodies**".

The evidence for these is shown as follows:

In "**On the electrodynamics of Moving Bodies**",
(http://www.fourmilab.ch/etexts/einstein/specrel/www/) , Einstein wrote:

"**§ 2. On the Relativity of Lengths and Times**

The following reflexions are based on the principle of relativity and on the principle of the constancy of the velocity of light. These two principles we define as follows:--

1. 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.
2. Any ray of light moves in the ``stationary'' system of co-ordinates with the determined velocity *c*, whether the ray be emitted by a stationary or by a moving body. Hence

$$\text{velocity} = \frac{\text{light path}}{\text{time interval}}$$

where time interval is to be taken in the sense of the definition in § 1. ."

And "**§ 3. Theory of the Transformation of Co-ordinates and Times from a Stationary System to another System in Uniform Motion of Translation Relative to the Former**

Let us in ``stationary'' space take two systems of co-ordinates, i.e. two systems, each of three rigid material lines, perpendicular to one another, and issuing from a point. Let the axes of X of the two systems coincide, and their axes of Y and Z respectively be parallel. Let each system be provided with a rigid measuring-rod and a number of clocks, and let the two measuring-rods, and likewise all the clocks of the two systems, be in all respects alike.

Now to the origin of one of the two systems (k) let a constant velocity v be imparted in the direction of the increasing x of the other stationary system (K), and let this velocity be communicated to the axes of the co-ordinates, the relevant measuring-rod, and the clocks. To any time of the stationary system K there then will correspond a definite position of the axes of the moving system, and from reasons of symmetry we are entitled to assume that the motion of *k* may be such that the axes of the moving system are at the time *t* (this ``*t*'' always denotes a time of the stationary system) parallel to the axes of the stationary system.

We now imagine space to be measured from the stationary system K by means of the stationary measuring-rod, and also from the moving system *k* by means of the measuring-rod moving with it; and that we thus obtain the co-ordinates *x*, *y*, *z*, and ξ, η, ζ respectively. Further, let the time *t* of the stationary system be determined for all points thereof at which there are clocks by means of light signals in the manner indicated in § 1; similarly let the time τ of the moving system be determined for all points of the moving system at which there are clocks at rest relatively to that system by applying the method, given in § 1, of light signals between the points at which the latter clocks are located.

To any system of values *x*, *y*, *z*, *t*, which completely defines the place and time of an event in the stationary system, there belongs a system of values ξ, η, ζ, τ, determining that event relatively to the system *k*, and our task is now to find the system of equations connecting these quantities.

In the first place it is clear that the equations must be *linear* on account of the properties of homogeneity which we attribute to space and time.

If we place $x'=x-vt$, it is clear that a point at rest in the system *k* must have a system of values *x*', *y*, *z*, independent of time. We first define τ as a function of *x*', *y*, *z*, and *t*. To do this we have to express in equations that τ is nothing else than the summary of the data of clocks at rest in system *k*, which have been synchronized according to the rule given in § 1.

From the origin of system *k* let a ray be emitted at the time τ_0 along the X-axis to *x*', and at the time τ_1 be reflected thence to the origin of the co-ordinates, arriving there at the time τ_2; we then must have $\frac{1}{2}(\tau_0+\tau_2)=\tau_1$, or, by inserting the arguments of the function τ and applying the principle of the constancy of the velocity of light in the stationary system:--

$$\frac{1}{2}\left[\tau(0,0,0,t)+\tau\left(0,0,0,t+\frac{x'}{c-v}+\frac{x'}{c+v}\right)\right]=\tau\left(x',0,0,t+\frac{x'}{c-v}\right).$$

.”

And “Substituting for *x*' its value, we obtain

$$\begin{aligned}\tau &= \phi(v)\beta(t-vx/c^2),\\ \xi &= \phi(v)\beta(x-vt),\\ \eta &= \phi(v)y,\\ \zeta &= \phi(v)z,\end{aligned}$$

where

$$\beta=\frac{1}{\sqrt{1-v^2/c^2}},$$

.”

In an above exerpts of "**On the Electrodynamics of Moving Bodies**", the error and contradiction is where: "Any ray of light moves in the ``stationary'' system of co-ordinates with the determined velocity *c*, whether the ray be emitted by a stationary or by a moving body. Hence

$$\text{velocity} = \frac{\text{light path}}{\text{time interval}}$$

where time interval is to be taken in the sense of the definition in § 1."

And "If we place $x'=x-vt$, it is clear that a point at rest in the system *k* must have a system of values x', y, z, independent of time. We first define τ as a function of x', y, z, and t. To do this we have to express in equations that τ is nothing else than the summary of the data of clocks at rest in system *k*, which have been synchronized according to the rule given in § 1.". This is because the velocity of light in the stationary system K is equal to $c \approx 3.10^8$m/s and the velocity of light in the moving sytem k is also equal to $c \approx 3.10^8$m/s. From this, the velocity: v of moving system k will be v=0 .

We assume that the students find this and ask their teacher as follows:

In using Einstein's second postulate of the velocity of light, in which c=constant, (in § 2) and " If we place $x'=x-vt$, it is clear that a point at rest in the system *k* must have a system of values x', y, z, independent of time. We first define τ as a function of x', y, z, and t. To do this we have to express in equations that τ is nothing else than the summary of the data of clocks at rest in system *k*, which have been synchronized according to the rule given in § 1. .", **and** "From the origin of system *k* let a ray be emitted at the time τ_0 along the X-axis to x',… **.", (in § 3) , we find that the velocity of light in the moving system k with the co-ordinates (ξ, η , ς , τ) is equal to $c \approx 3.10^8$m/s . This means that the observers, who are in the system k (ξ, η , ς , τ), find that a distance x'=x – vt on the X axis of system K (x, y, z, t) is measured by $x'=x - vt \approx 3.10^8$m and the time τ on the X axis of system K is mesured by τ ≈ s , because x'=cτ , so $c=x'/\tau \approx 3.10^8$m/s as their measurment: (x' and τ). And the velocity of light in the stationary system K with the co-ordinates (x, y, z, t) is also equal to $c \approx 3.10^8$m/s . It also means that the observers, who are in the system K (x, y, z, t), find that a distance x on the X axis of system K (x, y, z, t) is measured by $x \approx 3.10^8$m and the time t on the X axis of system K is measured by t≈s , because x=ct , so $c=x/t \approx 3.10^8$m/s as their measurment: (x and t) . Because $x'=x - vt \approx 3.10^8$m and $x \approx 3.10^8$m ; τ≈s and t≈s , so x'= x – vt = x , and τ = t .**

We find that because x'= x – vt = x , so vt = 0 . This means that if the velocity of light, in which c=constant, (the velocity of light in the stationary system K is equal to c and the velocity of light in the moving system k is also equal to c), both the system k with co-ordinates (ξ , η ,ς , τ) and system K with co-ordinates (x, y, z, t) will not move. From this, v=0.

Thus , Einstein can not write: "From the origin of system *k* let a ray be emitted at the time τ_0 along the X-axis to x', and at the time τ_1 be reflected thence to the origin of the co-ordinates, arriving there at the time τ_2; we then must have $\frac{1}{2}(\tau_0+\tau_2)=\tau_1$, or, by inserting the arguments of the function τ and applying the principle of the constancy of the velocity of light in the stationary system:--

$$\frac{1}{2}\left[\tau(0,0,0,t)+\tau\left(0,0,0,t+\frac{x'}{c-v}+\frac{x'}{c+v}\right)\right]=\tau\left(x',0,0,t+\frac{x'}{c-v}\right).$$

" **, can he ?**

Because v=0 , this equation is only able to be written as follows:

“ $\frac{1}{2}\left[\tau(0,0,0,t)+\tau\left(0,0,0,t+\frac{x'}{c}+\frac{x'}{c}\right)\right]=\tau\left(x',0,0,t+\frac{x'}{c}\right)$ **”, isnt it ?**

Because of this, Einstein can not calculate the result:

“ Substituting for *x*' its value, we obtain

$$\begin{aligned}\tau &= \phi(v)\beta(t-vx/c^2),\\ \xi &= \phi(v)\beta(x-vt),\\ \eta &= \phi(v)y,\\ \zeta &= \phi(v)z,\end{aligned}$$

where

$$\beta=\frac{1}{\sqrt{1-v^2/c^2}},$$ **.”, can he ?**

How do the teachers answer the students ? Or are the teachers silenced ?

Conclusion:

We can not use Einstein’s original paper, “**On the Elctrodynamics of Moving Bodies**”, to teach the students in universities throughout the world if we don’t revise Einstein’s second postulate on the velocity of light, in which c = constant. And because Einstein’s original paper on special relativity is wrong, so are all the texbooks on special relativity, which have been re-written from Einstein’s original paper.

Hanoi, October 17, 2009 .