Open letter: To Scientists and Professors who are teaching students in the universities in the World.

Dear Scientists and Professors

During a century, from 1905 to 2010, we have been confused by Einstein's concept of light velocity being constant in empty space or in an absolute vacuum and his dilation coefficient which is $\gamma = 1/(1 - v^2/c^2)^{1/2}$. For over a century, all universities in the world have been confused by teaching this to students. Thus, the knowledge of students in the world has been limited and our science can't develop further to discover the natural laws of the universe. If we have any human sentiment and regard for students's development of knowlege, we can't keep teaching Einstein's confused theory of constant light velocity and the dilation coefficient which is non-existent.

So, I suggest Scientists and Professors who are teaching in universities in the world should correct Einstein's theory of Special Relativity before teaching students.

Sincerely
Le Van Cuong

P/S: To enclose a proof of variableness of light velocity and false coefficient γ , it is in paper: **"Light velocity changes as space and time change"**, and I will be ready to answer your every question.

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Light velocity changes as space and time change

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Since the appearance of Einstein's Special Relativety, in 1905, our concept of science has been confused by his second postulate:

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

velocity = light path / time interval

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

From the year 1905 to year 2010, during a century of confusion regarding light velocity as a universal constant, our intellegence need to extend further. In fact, light velocity is only constant and equal to c ≈ 300,000 km/s in all inertial frames of reference with the condition that space and time in all inertial frames are the same. If space and time in one frame of reference are different from space and time in an other, then the velocity of light moving in this frame of reference is different from the velocity of light which moves in the other frame of reference. In other words, when the space and time of the frame of reference change, then velocity of light also changes. And light velocity depends on the ray of light being emitted by a stationary or by a moving body.

Proof for this is shown as follows:

First, we analyse the dilation of time which is demonstrated by the texbook: **"Physics principles & problems", Merrill Publishing Company-Columbus, Ohio 43216, page 551 and 552** .

"*Appendix, A: 4* <u>*the meaning of time.*</u>

Einstein noted that these postulates seemed to contradict each other. Taken together, they did not seem to make sense. The problem, wrote Einstein, was that the measurement of position and time had to be considered very carefully.
Time, said Einstein, is something measured by clock. Consider a special clock installed on a satellite. At one end of a stick of length L_s is flash lamp and detector. At the other end is a mirror. The light flashes and the mirror. The light flashes and the mirror reflect the flash to the detector. The detector triggers the lamp, producing another flash. Each flash is like the tick of a clock. Now, this is not a practical clock, but it is one that illustrates the principle. An astronaut at rest with respect to the clock would find that the time between ticks, t_s , would be equal to the distance

traveled, $2L_s$, divided by the speed of light, c . That is, $t_s = 2L_s/c$. In other words, $ct_s = 2L_s$.
If the satellite is moving with velocity v in a direction perpendicular to the stick, consider what an observer on the earth would see. The lamp would flash, but in the time it takes the flash to reach the mirror, t_m , the mirror would have moved a distance vt_m. As shown in Figure A-2, the path taken by the light is the hypotenuse of a right triangle. The altitude is L_s , or $ct_s/2$ and the base is vt_m. Because light moves at the same velocity c for all observers, the distance traveled by the light is ct_m . The Pythagorean theorems states

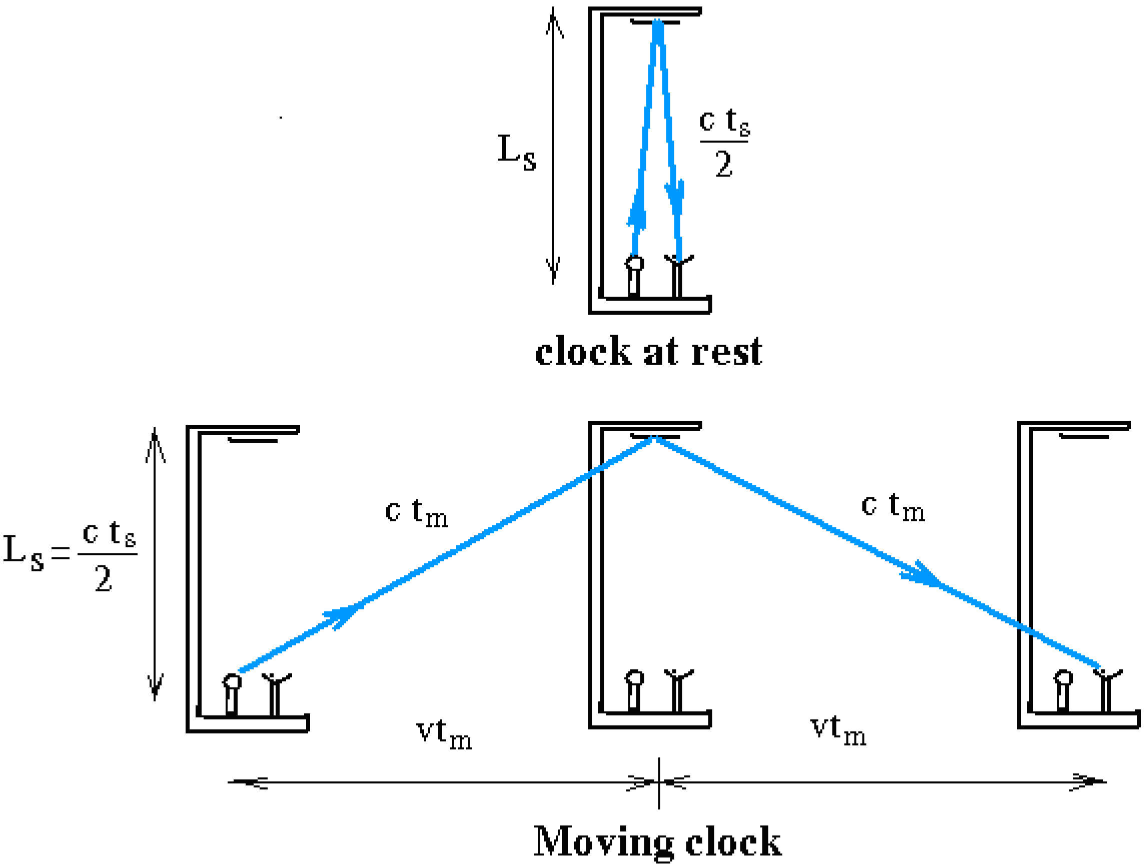
$$\left(\frac{ct_s}{2}\right)^2 + (vt_m)^2 = (ct_m)^2 \qquad\qquad t_m \quad \frac{ct_s}{2\sqrt{c^2 - v^2}}$$

The return trip to the detection takes the same amount of time. Let t_e be the time between "ticks" measured by the observer on the earth. Then $t_e=2t_m$, which is

$$t_e = \frac{t_s}{\sqrt{1 - \frac{v^2}{c^2}}}$$

The velocity is always smaller than c , so the denominator is always smaller than one. Thus t_e is always larger than t_s . That is, the moving clock on the satellite runs slowly as measured by an observer on the ground. This is called time dilation."

***Figure A-2 .** Experimental apparatus to measure time using light*



We find that a demonstation of dilation of time in the texbook: "**Physics principles & Problems**" illustrates the case :

A ray of light which is emitted from a satellite moves in a direction perpedicular to the direction the satellite is moving.

In "**Physics Principles & Problems**", the calculation of time passing in the satellite when it doesn't move is t_s and a time passing in a moving Satellite is t_e based on the equation: $t_e= t_s /(1- v^2/c^2)^{1/2}$ as such it is also correct. But if we are intelligent, we will find that this is not absolutely correct. To calculate time passing in a moving satellite, the obsevers who are on Earth presumed a time of, $2t_m = t_e$ with their earth clock. In fact, they can't measure time $2t_m = t_e$ exactly for a clock in a moving satellite.

Further, in Einstein's second postulate: " **velocity = light path / time interval** ", we find that the velocity of light is **invariable**. how can the **time interval be variable**? This is a contradition in Einstein's second postulate which must be revised.

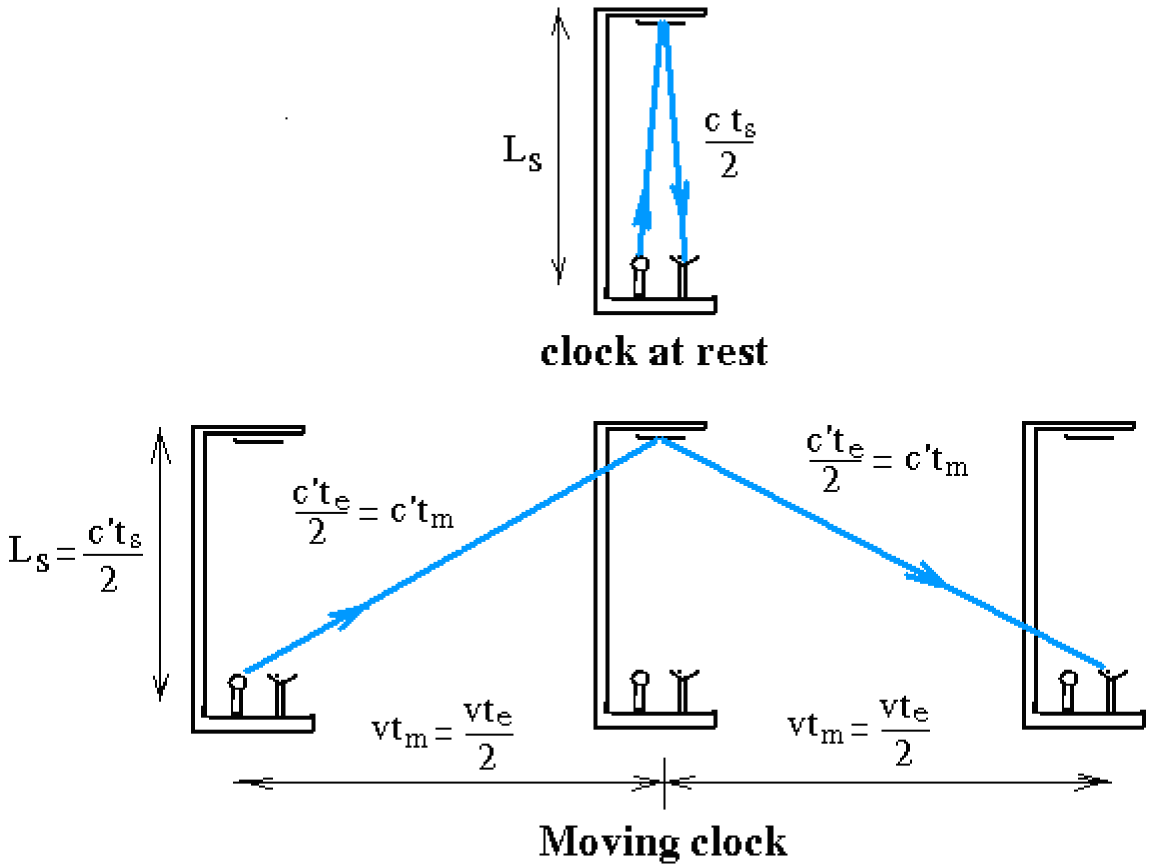
The observers who are on earth can only measure time passing exactly with a clock which is in the satellite when it is not in motion. This is because time passing on a clock which is in the motionless satellite and a time passing on a clock which is on earth are simultaneous. So $t_s = t_e$.

The calculation of a velocity of light in the satellite is also similar to the calculation of a time passing in the satellite. The obsevers who are on the earth can only exactly measure the velocity of light which is c in the satellite when it doesn't move. This is because a time passing: t_s in the motionless satellite and time passing: t_e on Earth are the same, $t_s = t_e$. And because time passing is a component of velocity, is a formula: **velocity = light path / time interval** .

In fact, the observers who are on earth can only view light velocity in the moving satellite, but they can't exactly measure it as c in the moving satellite. Because the observers who are on earth can't exactly measure the velocity of light in the moving satellite and because the **time interval,** which is a component of **velocity** can be variable, they can only assume the velocity of light is c' as they presumed a time passage of $2t_m = t_e$ in the moving satellite .

Because the velocity of light in the satellite when it doesn't move is c, and in the moving Satellite is presumed to be c', (because in fact, we can't measure it exactly in the moving Satellite and the **time interval** which is a component of velocity can be variable), we are right to re-write and to re-illustrate **Figure A-2** as follows:

Figure A-2. *Experimental aparatus to measure time using light*



Since **Figure A-2** , which is re-written and re-illustrated, the Pythagorean theorem states :

$$(c'.t_e / 2)^2 = (c'.t_s / 2)^2 + (v.t_e / 2)^2$$

$$\rightarrow \qquad (c'^2 - v^2) .t_e^2 = c'^2 .t_s^2 \qquad \rightarrow \qquad t_e^2 = c'^2 .t_s^2 / (c'^2 - v^2)$$

$$\rightarrow \qquad t_e = t_s / (1 - v^2 / c'^2)^{1/2} \qquad (1)$$

We find that a time t_s in the satellite when it doesn't move is different than time t_e in the moving Satellite in equation (1), and in equation (1): $t_e = t_s /(1 - v^2/c'^2)^{1/2}$, the velocity of light c' is unknown.

To confirm c', we find that observers who are on earth, determine that although the Satellite moves or doesn't move, a distance L_s it is invariable. This is because the distance: L_s is perpendicular to the direction the satellite is moving. Because the distance: L_s of the Satellite is invariable, so the Observers who are on the Earth can calculate the distance: L_s with their measurement of light velocity which is c and time passage which is t_e. It is calculated as $L_s = c'.t_s / 2 = c.t_e / 2$, because when the Satellite doesn't move, then $c' = c$ and $t_s = t_e$.

From $L_s = c'.t_s / 2 = c .t_e / 2$, the Pytagorean theorems states:

$$(c'.t_e / 2)^2 = (c .t_e / 2)^2 + (v .t_e / 2)^2$$

$$\rightarrow \qquad c'^2 = c^2 + v^2 \qquad \text{or} \qquad c' = (c^2 + v^2)^{1/2} \qquad (2)$$

Since equation (2): $c' = (c^2 + v^2)^{1/2}$, we are right to conclude as follows:

The velocity of light c in the Satellite when it doesn't move is different from the velocity of light c' in the moving Satellite, so light velocity c is not constant. The difference between velocity of light c and c' with the equation $c'= (c^2 + v^2)^{1/2}$ shows that the light velocity depends on movement of velocity v of the satellite. It means that the velocity of light depends on the ray of light being emitted by a stationary or by a moving body.

Because c' is confirmed by $c'= (c^2 + v^2)^{1/2}$, we replace it in equation: (1). We find that

$$t_e = t_s /\big(1 - v^2 /(c^2 + v^2) \big)^{1/2} \qquad (3)$$

(of which t_s is time passage in the satellite when it doesn't move ; t_e is time passage in the moving satellite ; v is the velocity of the moving satellite ; c is the velocity of light).

We find that when the Satellite doesn't move or the moving of the satellite with velocity is v = 0, then the time passage which is t_s in the satellite and a time passing which is t_e on earth are simultaneous, so $t_s = t_e$. From $t_s = t_e$ and equation (3):

$$t_e = t_e / \big(1 - v^2 / (c^2 + v^2) \big)^{1/2} \rightarrow \quad 1 = 1 / \big(1 - v^2 / (c^2 + v^2) \big)^{1/2} \qquad (4)$$

Equation (4) shows that when the velocity of the moving satellite is v = 0, then every physical factor in the moving satellite such as light velocity and time passing are not changed. But if $v \neq 0$, then every physical factor varies.

From equation (4), we put $\gamma = 1 / \big(1 - v^2 / (c^2 + v^2) \big)^{1/2}$ and we call it the dilated coefficient: γ . We have $t_e = t_s . \gamma$.

Above, we considered the case of a ray of light which moves in a direction perpendicular to the direction of the satellite's motion. And we confirmed that light velocity is not constant and time passing at t_s in the Satellite when it doesn't move is different from t_e in the moving satellite. But the difference between t_s and t_e doesn't obey equation: $t_e=t_s /(1 - v^2/c^2)^{1/2}$ or the dilation coefficient: $\gamma = 1/(1 - v^2/c^2)^{1/2}$ in the texbook: **Physics Principle & Problems** . In fact, the difference between t_e and t_s obeys equation: $t_e=t_s /\big(1 - v^2/(c^2 + v^2)\big)^{1/2}$ or the dilationd coefficient: $\gamma = 1/\big(1 - v^2/(c^2 + v^2) \big)^{1/2}$.

To confirm the change of light velocity and the dilation coefficient: γ we consider the case of a ray of light which, emitted from the satellite, moves in the same direction as the satellite's motion in Einstein's paper: " **On the Electrodynamics of Moving Bodies** " written in 1905, as follows:

A ray of light which is emitted from the satellite moves in the direction of the satellite's motion.

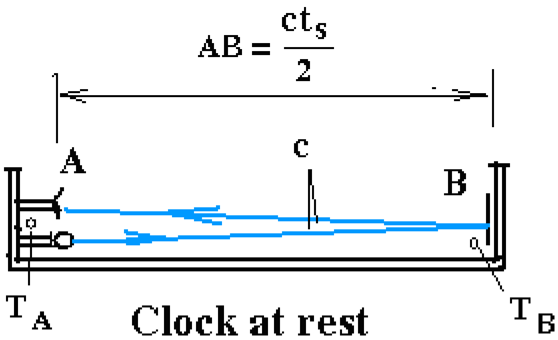
Assume that there are two identical satellitess, one of them with a length: AB is in empty space and is stationary, so we call it is the stationary system AB. The other Satellite with length: AB moves in uniform motion with velocity v in empty space, and is called the moving system AB. At the points A and B in the stationary system AB and the moving system AB, we put clocks and observers in order that they view time passing and the translation of light in the space of their "stationary system" and in the space of the "neighbouring moving system". At points A in the stationary system AB and the moving system AB we put the lamps which shine lights from A to B. At the points B we put mirrors in order to reflect the lights arriving from A to return A.

The observers who are in the stationary system AB and in the Earth find and measure their velocity of light which is c , but they can't measure the velocity of light when it moves in the space of the moving system A'B', so they assume that the velocity of light in the space of the moving system is c' . On the contrary, the observers who are in the moving system A'B' also measure their velocity as c , but they also can't measure the velocity of light in the space of the stationary system AB and of the earth, so they also confirm temporary that the velocity of light in space of the stationary system AB and of the Earth is c'. When the moving system A'B' doesn't move, i.e., its velocity is v = 0 , then the observers who are in the stationary system AB and in the Earth can measure the velocity of light in space of the moving system AB , so , in this case we confirm that c = c' .

As the postulate of light velocity is constant in all inertial frames of reference, this doesn't mean that light velocity has to be equal to c in all inertial frames. Because the observers who are on earth and in the stationary system AB can't measure the exact velocity of light which is c in the moving system A'B', they can only presume the velocity of light is c' in the moving system. So the velocity of light is constant in the stationary system AB or on earth, and the velocity of light which is c' is constant in the moving system A'B'.

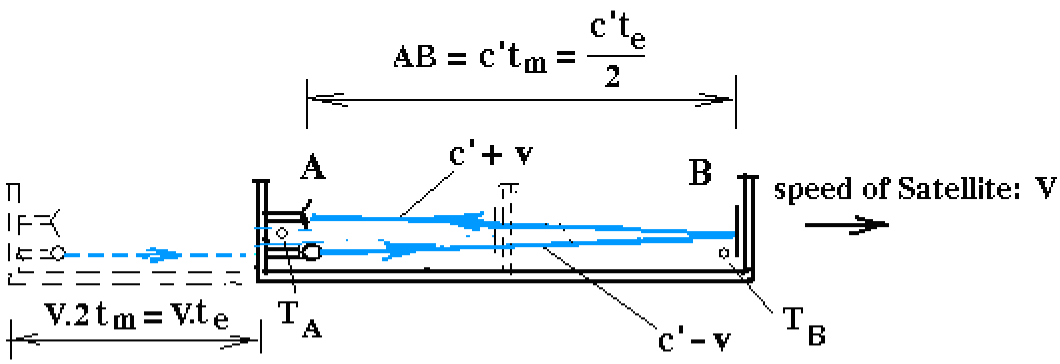
If we call t_s a time passage of a ray of light c when it moves from A to B and reflects from B to return to A in the stationary system AB, then the length of the stationary system AB will be $c.t_s / 2$. And if we call t_m as a time passage of a ray of light c' when it moves from A' to B' in the moving system A'B', then the length A'B' of the moving system will be $c'.\ t_m$. When the ray of light c' moves from A' to B' in the moving system A'B' = $c'.\ t_m$, then the moving system A'B' also moves with velocity v over a distance $v.t_m$. Let t_e be the time passing when a ray of light c' moves from A' to B' and reflects from B' to return to A' in the moving system A'B' measured by the observers on the Earth or on the stationary system AB, ($t_s = t_e$). Then $t_e = 2.t_m$. (Please see illustration **figure: B-1**)

Figure B - 1



Clock at rest

(The stationary system AB)



Moving clock

(The moving system AB)

We find that when the moving system A'B' doesn't moves, i.e...its velocity is v = 0 , (in **figure B-1** , it is similar to the illustration of **Clock at rest, (The stationary system AB)**), then the observers who are on the earth or on the stationary system AB find that clocks which are put at A' and B' are simultaneous, because the clocks which are put at A' and B' show a time passed to be t_{AB} when a ray of light moves from A' to B' and the clocks which are at B' and A' show a time passing of t_{BA} when a ray of light moves from B' to A' are equal to:

$$t_{AB} = (T_B - T_A) = A'B' / c = t_{BA} = (T_A - T_B) = B'A' / c \qquad (5)$$

($t_{AB} = (T_B - T_A)$ and $t_{BA} = (T_A - T_B)$, in which T_A is a clock which is put at A' and shows time passing at A' , and T_B is a clock which is put at B' shows a time passing at B' , and A'B' = B'A')

But when the system A'B' moves with velocity v , (in a **figure B-1** , it is illustated by the m**oving clock , (The moving system A'B')**), then the observers who are on earth or on the stationary system AB find that the clocks which are put at A' and B' in the moving system A'B' are not simultaneous. This is because:

$$t_{AB} = (T_B - T_A) = A'B' /(c' - v) \neq t_{BA} = (T_A - T_B) = A'B' /(c' + v) \qquad (6)$$

Further, the observers who are on the stationary system AB or on Earth can say that the velocity of light c' in thespace of the moving system is different than the velocity of light c of their the stationary system AB or of the earth. This is because when the velocity v of the moving system A'B' is equal to the velocity of light c , then the mathematical equation is not absurd. The mathematical equation is only absurd when it is A'B' / 0 = ∞ , if c' = c :

$$t_{AB} = AB /(c' - c) \neq A'B' /(c - c) = A'B' / 0 = \infty \quad \rightarrow \quad c' \neq c$$

On the contrary, the observers who are in the moving system A'B' deem their system doesn't move and the station system AB or the earth is moving with velocity v . They also find that clocks which are put at A' and B' in the moving system A'B' is simultaneous and the clocks which are put at A and B in the stationary system AB are not simultaneous . Because:

$$t_{AB} = (T_B - T_A) = AB /(c + v) \neq t_{BA} = (T_A - T_B) = AB /(c - v)$$

And they also say that the velocity of light c' in their moving system A'B' is different than velocity of light c in the stationary system AB. Because when velocity v of the stationary system AB is equal to the velocity of light c', then the mathematical equation in there is not absurd . The mathematical equation is only absurd when it is AB / 0 , if c = c' :

$$t_{BA} = BA /(c - c') \neq BA /(c' - c') = BA / 0 = \infty \quad \rightarrow \quad c \neq c'$$

Thus, we see that we can not attach any absolute significance to the concept of simultaneity and constancy of the velocity of light, but that two events and the constancy of light which, viewed from a system or a frame of reference, are simultaneous events and constancy of the velocity of light, can no longer be looked upon as absolute when envisaged from a system or a frame of reference which is in motion relative to that system or that frame of reference.

To confirm c ≠ c' more clearly, we deem that we are on earth or in the stationary system AB and calculate the velocity of light c' and time passing in the moving system A'B' as per the illustation in **figure B - 1**.

Because A'B' = B'A' in the moving system A'B', we find that the total time t_{AB}=A'B' / (c' - v) and t_{BA}=A'B' /(c' + v) has to be equal to time t_{AA}= 2.A'B' /c' in which a ray of light c' moves from A' to B' and reflected from B' to A' in the view of the observers who are in the moving system A'B'.

This means that ($t_{AB} + t_{BA} = t_{AA}$) :

$$A'B' /(c' - v) + A'B' /(c' + v) = 2.A'B' /c'$$

$$1/(c' - v) + 1/(c' + v) = 2/ c'$$

$$1/(c'^2 - v^2) = 1/ c'^2$$

$$c' = (c'^2 - v^2)^{1/2} \quad \rightarrow \quad 1 = 1 /(1 - v^2/c'^2)^{1/2} \qquad (7)$$

In equation (7), c' is unknown. To confirm c', we find that when the moving system A'B' doesn't move, i.e... its velocity is $v = 0$, then $c'= c$ or $c'/c = 1$. To replace $c'/c =1$ into equation (7), we have equation:

$$c'/c = 1/(1 - v^2/c'^2)^{1/2}$$

$$c' = c /(1 - v^2/c'^2)^{1/2} \qquad (8)$$

$$\rightarrow \qquad c = (c'^2 - v^2)^{1/2} \quad \text{or} \quad c' = (c^2 + v^2)^{1/2} \qquad (9)$$

From an equation (7): $1 = 1 /(1 - v^2/c'^2)^{1/2}$, and equation (9): $c'= (c^2 + v^2)^{1/2}$, we find that when the moving system A'B' moves with velocity v , $v \neq 0$, then every physical factor is changed and the velocity of light c' is different from velocity c , ($c' \neq c$).

c' is confirmed by equation (9): $c' = (c^2 + v^2)^{1/2}$, we replace it into equation (7) and (8), we have equations :

$$1 = 1/ \big(1 - v^2/(c^2 + v^2) \big)^{1/2} \qquad (10)$$

And

$$c' = c / \big(1 - v^2/(c^2 + v^2) \big)^{1/2} \qquad (11)$$

From equation (10), put $\gamma = 1 / \big(1 - v^2/(c^2 + v^2) \big)^{1/2}$, we call it the dilation coefficient. To replace γ into the equation (11), we get the equation of transformation of the velocity of light from the stationary system AB to the moving system A'B' :

$$c' = c . \gamma$$

An analogous consideration applied to time passing in the moving system A'B', when it doesn't move, $v = 0$, we find that $t_e = t_s \rightarrow t_e/t_s=1$. To replace $t_e/t_s=1$ in equation (10) , we have

$$t_e /t_s = 1/ \big(1 - v^2/(c^2 + v^2) \big)^{1/2}$$

Because $\gamma = 1/\big(1 - v^2/(c^2 + v^2)\big)^{1/2}$, so the equation of transformation of time from the stationary system AB to the moving system A'B' is

$$t_e/t_s = \gamma \quad \text{or} \quad t_e = t_s \,.\, \gamma$$

We find that the change of light velocity and time as well as the dilation coefficient: $\gamma=1/(1- v^2/(c^2 + v^2))^{1/2}$ in this case, and the change of light velocity and time as well as the dilation coefficient: γ in case of a ray of light which is emitted from the satellite moving in a direction perpendicular to the satellite's motion, are the same.

Obviously, light velocity is not a universal constant. The velocity of light also changes as space and time change. Einstein's dilation coefficient which is $t_e = t_s /(1 - v^2/c^2)^{1/2}$ is not correct.

It is pity, because with this dilate coefficient: $\gamma = 1/(1 - v^2/c^2)^{1/2}$, Einstein has erroneously conjectured that the velocity of light is the limit of all velocity. His confusion is such as to make our development of science difficult.

Conclusion

Einstein's second postulate of light velocity which is a universal constant and the dilation coefficient in his special relativity must be revised.

The velocity of light is also a relative velocity as is a relative space or relative time. We can't understand that with the " **velocity = light path / time interval** " in Einstein's second postulate of his Special Relativity, why the " **light path** " and " **time interval** " change, but "**velocity**" does not changed ? We can only teach our students that "**velocity = light path /time interval**". If "**light path**" and "**time interval**" are changed, then "**velocity**" will be also changed.

Einstein's dilation coefficient: $\gamma = 1/(1- v^2/c^2)^{1/2}$ in his special relativity must be replaced by

$$\gamma = 1/\left(1 - v^2/(c^2 + v^2)\right)^{1/2}$$

I think that we can't keep on Einstein's confusion regarding light velocity and his dilation coefficient: γ any longer. It is necessary to correct it as soon as possible.

Hanoi, October 16, 2010