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Einstein's Energy Formula Must Be Revised

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Information from a science journal shows that the dilation of time in Einstein's special relative theory was proven by the experiment of scientists from Canada last month. It means that the experimental apparatus using light[1] for measurement is correct.

"Appendix, A: 4 *the meaning of time."*
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 a clock. Consider a special clock installed on a satellite. At one end of a beam of length L_s is a flash lamp and detector. At the other end is a mirror. The light flashes and the mirror reflects 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/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

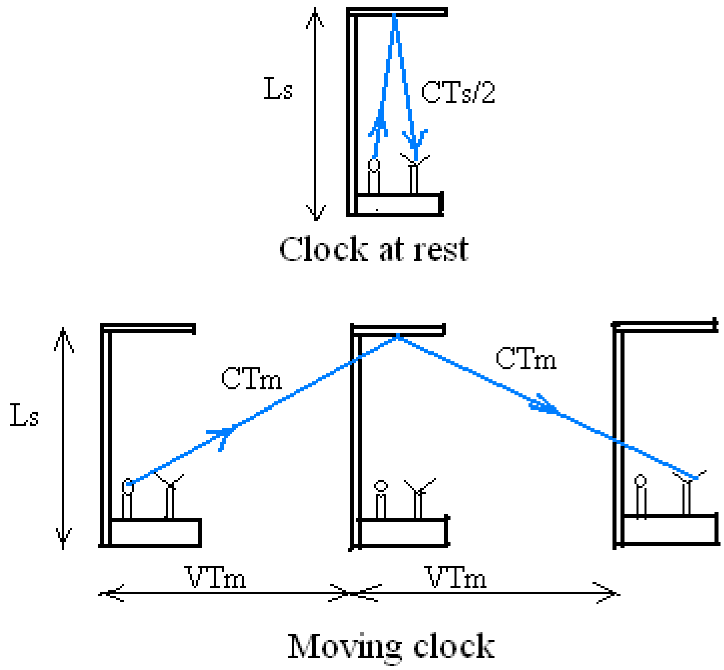
$$\left(\frac{ct_s}{2}\right)^2 + (vt_m)^2 = (ct_m)^2 \qquad t_m = \frac{ct_s}{2\sqrt{c^2 - v^2}}$$

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



Note: We realize that t_s is a time passing of frame at rest (Clock at rest) and t_e is a time passing of the moving frame (Moving clock).

$$t_e = \frac{t_s}{\sqrt{1-\frac{v^2}{c^2}}} \quad , \quad \text{because:} \quad \gamma = \frac{1}{\sqrt{1-\frac{v^2}{c^2}}} \quad . \quad \text{So} \quad t_e = t_s.\gamma$$

(γ is dilate coefficient)

In my opinion, in fact the light velocity also changes with the gravitational field of the reference frame by a dilate coefficient: γ and Einstein's formula: $E_r=m_o.\gamma.c^2$ which expresses the energy of frame when it moves with changing mass, space and time has to be $E_r=m_o.\gamma.c_o^2\ \gamma^2$. This is proved as follows:

Since *Figure A-2* is an experiment apparatus to measure time using light, we find that $l_e=c.2t_m=c.t_e$ is the distance of translation of light in the moving frame and $l_s=2L_s=c.t_s$ is distance of translation of light in the frame at rest.

We call $l_s=300{,}000km_o$ and $t_s=s_o$ are components of unit of light velocity: $c=c_o$ in the frame at rest. Then $c=c_o=300{,}000km_o/s_o$.
And if we call $l_e=300{,}000km_r$ and $t_e=s_r$ are components of unit of light velocity: c_r in the moving frame. Then $c_r=300{,}000km_r/s_r$.

In the moving frame, (in figure: Moving Clock), Einstein has written $l_e=2.c.t_m=c.t_e$. Because $c=c_o=300{,}000km_o/s_o$, so

$l_e=300{,}000km_o/s_o.2t_m$ or $l_e=300{,}000km_o/s_o.t_e$

We realize that km_o/s_o is a unit of light velocity: $c=c_o$ in the frame at rest and $2t_m$ or $t_e=s_r$ is unit of time in the moving frame. The unit of time: $t_s=s_o$ in the frame at rest (in figure: Clock at rest) is different from the unit of time: $t_e=s_r$ in the moving frame (in figure: Moving clock). The distance of translation of light in the moving frame: l_e is only calculated when the unit: km_o/s_o becomes km_r/s_r , or the unit of time t_e becomes $t_s.\gamma$. So $l_e=c_r.t_e$ and $l_e \neq c.t_e \rightarrow c \neq l_e/t_e = c.2t_m/2t_m = c$. Einstein has been confused by this c=300,000km/s in the moving frame. (Einstein forgot to alter from the units of space: km_o and time: s_o in the frame at rest to the units of space: km_r and time: s_r in the moving frame, or he could be confused by the calculation: $v=\frac{km}{s}=v'=\frac{km.\gamma}{s.\gamma}$)

However, the experimental apparatus to measure time using light as per **figure: a-2** is correct if we consider c is only c=300,000=constant which correct in all frames of reference and the unit: km/s of c=300,000 will be calculated in space and time of each frame of reference.

Then, because $t_e=s_r$ and $t_s=s_o$ and $t_e=t_s.\gamma$ and $l_e=c_r.t_e$, so

$$l_e=c_r.t_e=300{,}000km_r/s_r.t_e= 300{,}000km_r$$

or $l_e=c.t_s.\gamma =300{,}000km_o/s_o.t_s.\gamma =300{,}000km_o.\gamma = l_s.\gamma$

Or the distance of translation of light: l_e can be also calculated as follows:

From $t_m=\frac{ct_s}{2\sqrt{c^2-v^2}}=\frac{t_s}{2\sqrt{1-\frac{v^2}{c^2}}} \rightarrow l_e=2ct_m=\frac{ct_s}{\sqrt{1-\frac{v^2}{c^2}}}$

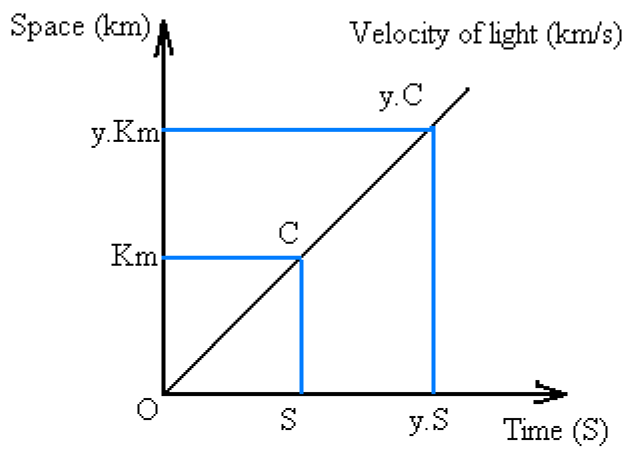
$l_s=ct_s$ and $\gamma=\frac{1}{\sqrt{1-\frac{v^2}{c^2}}} \rightarrow l_e = l_s.\gamma$

We find that the space which is denoted by distance: l_e in the moving frame is also dilate and the light velocity in the moving frame is $c_r=l_e/t_e$, thus:

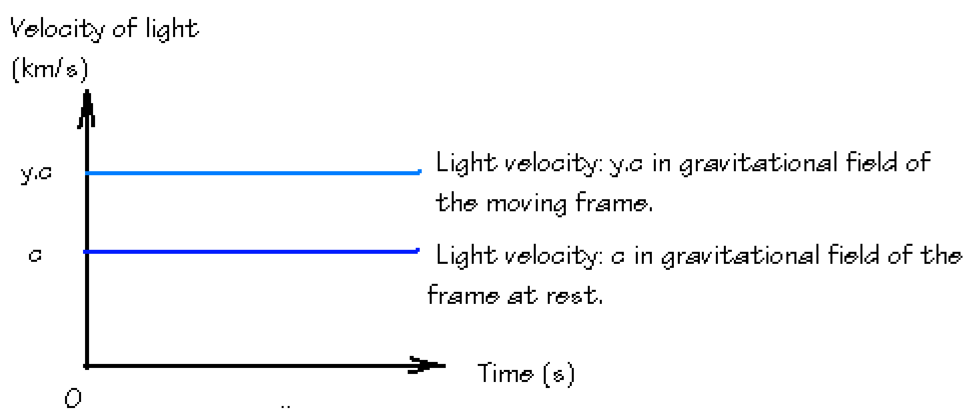
$$c_r=\frac{l_e}{t_e}=\frac{l_s.\gamma}{t_s.\gamma}=\frac{300{,}000km_r}{s_r}=\frac{300{,}000km_o.\gamma}{s_o.\gamma} \quad \text{or} \quad c_r = c_o.\gamma$$

($km_o/s_o < km_o.\gamma/s_o.\gamma = \gamma.km_o/s_o \rightarrow c_o < c_r = c_o.\gamma$)

This is because space and time are components of velocity and we can see graph of the components of space, time and light velocity as follows:



From a graph of the components of space, time and light velocity, we can illustrate a graph of velocity of light as follows:



(It is easy to make a mistake for the observers when they are in the frame at rest and use the units: km; s and calculate the velocity in space and time of the moving frame with units: km.γ ; s.γ . The observers always see and calculate:

$$v = \frac{km}{s} = v' = \frac{km.\gamma}{s.\gamma}$$

(Of which v is velocity using: km and s , and v' is velocity in the space and time using: km.γ and s.γ) .

But the observers that are in the moving frame in the space and time having units: km.γ and s.γ always realize that the velocity in their space and time is only $v' = \frac{km.\gamma}{s.\gamma}$, and not: $v' = \frac{km}{s}$. To compare the velocity in the space and time with units: km and s and the velocity in the space and time with a units: km.γ and s.γ , we find that they are similar, but not equal. So,

$$v' = \frac{km.\gamma}{s.\gamma} \neq v = \frac{km}{s} \qquad v' = \frac{km.\gamma}{s.\gamma} = \gamma.\frac{km}{s} \quad \rightarrow \quad v' > v \text{ , if } \gamma > 1 \text{)}$$

Because c_r=c.γ =c_o.γ , so Einstein's formula: $E_{re}=m_o.\gamma.c^2$ which expresses the energy of frame when it moves with changing mass, space and time has to be $E_r=m_o.\gamma.c_o^2.\gamma^2$ or $E_r=m_o.\gamma^3.c_o^2$.

We can conclude that light velocity: $c=c_o$ in the frame at rest is different from the light velocity: c_r in the moving frame and we can't apply c=300,000km_o/s_o for the frames which move, where the space and time are changed. Einstein's formula: $E_{re}=m_o.\gamma.c^2$ is incorrect and it has to be revised by $E_r=m_o.\gamma^3.c_o^2$.

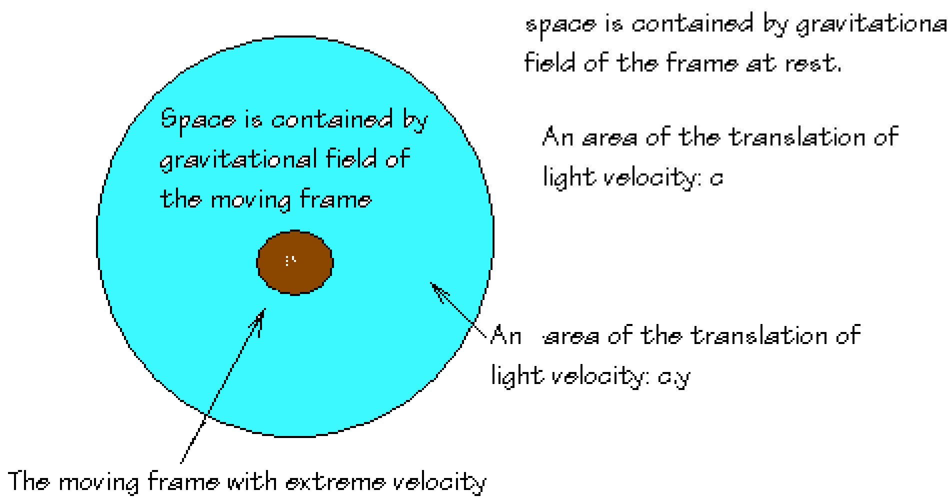
Einstein has shown the changes of the space and time in the frame when moving rapidly, but he has been confused by his concept of invariable light velocity. The light velocity in the frame at rest is similar to the light velocity in the moving frame, but the light velocity in the frame at rest is not equal to the light velocity in the moving frame.

We also have to understand that the translation of light in the frame at rest and in the moving frame is not in an empty space or absolute vacuum. There is no empty space or absolute vacuum as per Einstein's second postulate. If it were empty space, how can it contract or expand? The translation of light has been made in the gravitational field of the frame at rest and the moving frame. The gravitational field of the moving frame is different from the gravitational field of the frame at rest.

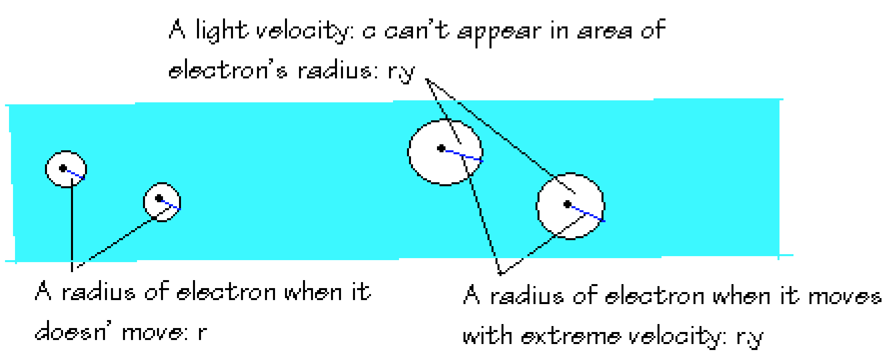
From Einstein's formula of energy of the moving frame with extreme velocity: $E_r=\gamma.m_o.c^2$ has to be revised by $E_r=m_o.\gamma.c_o^2.\gamma^2$. We find that the mass of the frame at rest is m_o and the mass of the moving frame with extreme velocity is $\gamma.m_o$. If the mass of the frame at rest (in the figure A:2 is Clock at rest) is m_o and its gravitational field in space is G, then the mass of the moving frame with extreme velocity (in the figure A:2 is Moving clock) is $\gamma.m_o$ and its gravitational field in space is γ.G. The light velocity in the gravitational field: G of the frame at rest is c_o , but the light velocity in the gravitational field: γ.G of the moving frame with extreme velocity is $c_r= \gamma.c_o$.

So when the gravitational field of the frame of reference is changed from G to γ.G, then the light velocity is also changed from c_o to $c_r= \gamma.c_o$.

We can illustrate the translation of light in space which is contained by gravitational field of the moving frame as follows:



In the physical quantum, when the particle (electron...) moves with extreme velocity, then its gravitational field is increased. We can't see the light velocity: c.γ in an electron's gravitational field: r.γ when it moves with extreme velocity, but we can find that electron's radius is larger than its origin's radius: r by the dilate coefficient: γ and light velocity. c can't appear in the area of radius: r.γ of electron.



Conclusion:

Since 1905, we have been confused by Einstein's concept of invariable light velocity in an empty space or absolute vacuum. In fact, the translation of light has been made in space, which is contained by the gravitational field of the reference frame. When this is changed, then the translation of light is also changed.

Einstein's second postulate in special relative theory has to be revised by the light velocity changes in the gravitational field of the reference frame. At best, we should affirm that light velocity is only constant in each frame of reference and the three physical factors (light velocity: km/s; space: km and time: s) in all frames of reference are directly related to one another. If it is changed, then these three physical factors have to alter to create a physical rule of equivalence among frames of reference.

A formula: $E_r = m_o.\gamma.c^2$ which expresses the energy of frame when it moves with changing mass, space and time has to be revised by $E_r = m_o.\gamma.c_o^2.\gamma^2$.

Only such a revision of Einstein's second postulate can satisfy the equivalence between the fixed frame and the moving frame when the latter's velocity is as large as light velocity (the Einstein frame). Thus, it can then rightly be said in physical science that light velocity is constant and equal to 300,000km/s in all inertial frames of reference in the universe and in the space and time of each inertial frame of reference.

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[1] Physics Principles & Problems", Merrill Publishing Company-Columbus, Ohio 43216, pages 551 and 552: