

Relativity Is Self-Defeated (2 of 3)

—In Terms of Physics

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Abstract *The velocity addition theorem* that witnesses the “impeccability” of relativity is actually an exact declaration rejecting the existence of the physical world fantasized by special relativity. The physical reality brought up by *frequency shift* related to movement, or the so called Doppler Effect, must also ruin the concept of time dilation advocated by relativity.

The *Michelson-Morley experiment*, devised to verify the existence or nonexistence of ether, turns out that it has just placed itself in a wrong environment for its performance. Therefore, this experiment has actually never done anything to confirm or reject the existence of ether. Of course, then, it has never offered any physical evidence that relativity can use as a support. Possibly it is to many people’s surprise that the *Ives-Stilwell experiment* and *stellar aberration* are actually physical evidence demolishing the credibility of relativity while they are still thought supporting by so many people.

As relativity can only end up invalidating the physical world it promotes, human beings should have good reason to revive the concept of *ether* that relativity asserts not existing.

Key Words medium, ether, projectile, frequency shift, aberration, Michelson-Morley experiment, Ives-Stilwell experiment

1 Relativity Declares Its Own Invalidity via The Theorem of Velocity Addition

In Newtonian physics, if object 1 has a speed u with respect to a ground observer and object 2 moving in the same direction as object 1 has speed w with respect to object 1, the ground observer will conclude that object 2 would move with speed $v = u + w$ with respect to the ground observer. However, the theorem of velocity addition in relativity must determine speed v should be calculated according to the following equation

$$v = \frac{u + w}{1 + \frac{uw}{c^2}} \quad (\text{Eq. 1})$$

Therefore, according to equation (Eq. 1), in case u is an unknown quantity and needed to be pursued in case w and v are known, we get

$$u = \frac{c^2v - c^2w}{c^2 - vw} \quad (\text{Eq. 2})$$

One outstanding effect from (Eq. 1) is that if w has the value of c , the speed of light, v must end up as c , regardless of the value of u . It is this effect that is thought as to have witnessed the “impeccable” validity of special relativity: speed of light must have the same constant value with respect to any inertial frame. However, with the resultant speed v also to be ended up as c , (Eq. 2) must lead to

$$u = \frac{0}{0} \quad (\text{Eq. 3})$$

No valid mathematical principle can be found validating (Eq. 3)!

As a matter of fact, the theorem of velocity addition and speed calculation expressed in a relativity’s original statement are directly intolerant to each other. Here is the quotation of such original statement:

Let a ray of light depart from A at the time t_A , let it be reflected at B at the time t_B , and reach A again at the time t'_A . Taking into consideration the principle of the constancy of the velocity of light we find that

$$t_B - t_A = \frac{r_{AB}}{c - v} \quad (\text{Eq. Re-A, for the ray and rod moving in same direction})$$

$$\text{and } t'_A - t_B = \frac{r_{AB}}{c + v} \quad (\text{Eq. Re-B, for the ray and rod moving in opposite direction})$$

where r_{AB} denotes the length of the moving rod—measured in the stationary system.

[Both Eq. Re-A and Eq. Re-B and the comments inside the parenthesis are notes from this author]

If relativity has fidelity to itself, since the ray is chasing r_{AB} on the frame r_{AB} from A to B at speed c , it is only fair for relativity to adhere to what it advocates. Then, in place of $c - v$ in [Eq. Re-A], from the view of the stationary observer, with the consideration of the **Theorem of Velocity Addition**, relativity should have written (Eq. Re. A), for example, in the form as

$$t_B - t_A = \frac{\frac{r_{AB} \text{ at moving}}{c + v}}{1 + \frac{cv}{c^2}} = \frac{r_{AB}\sqrt{1 - (v/c)^2}}{c} = \left(\frac{r_{AB}}{c}\right)\sqrt{1 - (v/c)^2} \quad (\text{Eq. 4})$$

Unfortunately to relativity, however, (Eq. 4) hereby declares one “principle”: **moving clock is seen running faster**, completely contradicting one of its famous conclusions: *moving clock runs slower*. (Eq. 4) obviously shows that it costs less time from the stationary clock, shown as $t_B - t_A$ on the left side of (Eq. 4), to see light completing the journey from A to B on r_{AB} with time shown as (r_{AB}/c) , which is the time recorded by a clock running together with r_{AB} .

No speed value can ever be found in the real world to materialize a physical system fantasized by special relativity with its theorem of velocity addition.

2 Results from the Ives-Stilwell Experiment Rejects Special Relativity

Here is the relativity's claim about the behavior of a moving clock:

...the time marked by the clock (viewed in the stationary system) is slow by $1 - \sqrt{1 - (v/c)^2}$ seconds per second... [§4. Physical Meaning of the Equations Obtained in Respect to Moving Rigid Bodies and Moving Clocks. **ON THE ELECTRODYNAMICS OF MOVING BODIES** By A. *Einstein*, 1905]

If photon ever exists as relativity conjectures, before the photon is separated from the source, in the stationary observer's inspection, he deals with only one moving clock, which is attached to the moving source. This clock forever runs at speed less than c in relativity's stipulation according to the above quotation. Once a photon is separated from the source, the observer must deal with one more clock, which is attached to the photon. Since photon must move at speed c , the mathematical result about time from the above quoted statement must be so written: “*...the time marked by the clock (of photon) is slow by $[1 - (0)]$ seconds per second...* This literally says that time lapse shown by the photon clock is seen frozen by the observer, because any oscillator is seen to stay at the same invariant state forever by the observer, i.e., no frequency of any kind is found by him. How frequency shift detection is made possible by an observer when he sees no frequency?

Therefore, if relativity is ever genuine to itself, the above quotation should have been enough to make it reject any idea of frequency shift of light caused by motion.

Nevertheless, relativity has the following equation connecting the pace of time lapse between a running clock and an observer's stationary clock:

$$t = \frac{t' + (v/c^2)x'}{\sqrt{1 - (v/c)^2}} \quad (\text{Eq. 5})$$

where all primed coordinates belong to the moving clock, or the light source, and the non-primed coordinates belong to the stationary observer. If the moving clock starts with $t'=0$, then

$$t = \frac{(v/c^2)x'}{\sqrt{1 - (v/c)^2}} \quad (\text{Eq. 6})$$

With the time advancement of one period p' in the moving clock, the observer's clock should have advanced to t_1 such that

$$t_1 = \frac{p' + (v/c^2)x'}{\sqrt{1 - (v/c)^2}} \quad (\text{Eq. 7})$$

Now, we have

$$\begin{aligned} t_1 - t &= \frac{p' + (v/c^2)x'}{\sqrt{1 - (v/c)^2}} - \frac{(v/c^2)x'}{\sqrt{1 - (v/c)^2}} \\ &= \frac{p'}{\sqrt{1 - (v/c)^2}} > p' \end{aligned} \quad (\text{Eq. 8})$$

Obviously, $t_1 - t > p'$, or $(1/t_1 - t) < 1/p'$, is a result disregarding the direction of v of the moving light source, whether approaching an observer or moving away. Such light source can as well be a photon, if photon ever exists. (Eq. 8) thus must fail to describe how frequency read from a moving clock is affected by the corresponding moving direction. For example, no blue-shift can be presented by (Eq. 8) to an observer who sees a clock approaching him, but instead, ironically, (Eq. 8) must inform him of red-shift. Indeed, (Eq. 8) even shows that the higher the v becomes, the more shifting toward the red could have been shown. The outcome so concluded from (Eq. 8) completely violates common knowledge and thus inevitably destroys relativity's credibility in explaining frequency shift caused by movement.

If we compare between equation (4) and equation (8), we do find this "truth" from relativity: **Liberally unbounded inconsistency is displayed in relativity**. With equation (4), relativity advocates **moving clock runs faster** via the theorem of velocity addition; with equation (8), relativity advocates **moving clock runs slower** but at the cost of the complete failure of presenting the relationship between moving direction and frequency shift.

We all know that there is one famous experiment claiming to have confirmed the frequency shift predicted by relativity. It is the Ives-Stilwell experiment done in 1938. That experiment shows that, for a light source approaching an observer, frequency shift is shown as

$$f = f' \cdot \sqrt{\frac{c+v}{c-v}} \quad (\text{Eq. } 9)$$

where f' is the actual frequency of the light source and f is the corresponding observed value. Equivalently, with the notation we have been using, we can have

$$\frac{1}{t_1 - t} = \frac{1}{p'} \cdot \sqrt{\frac{c+v}{c-v}} \quad (\text{Eq. } 10)$$

If ($t_1 - t$) represents the same time duration in both (Eq. 8) and (Eq. 10), and if relativity is to make itself meaningful, these two equations must lead to

$$\frac{p'}{\sqrt{1 - (v/c)^2}} = p' \sqrt{\frac{c-v}{c+v}} \quad (\text{Eq. } 11)$$

Then, $v=0$ must be concluded from (Eq. 11).

If the source is moving away from the observer, the Ives-Stilwell experiment gives

$$f = f' \cdot \sqrt{\frac{c-v}{c+v}} \quad (\text{Eq. } 12)$$

Similar reasoning leading to (Eq. 11) would give

$$\frac{p'}{\sqrt{1 - (v/c)^2}} = p' \sqrt{\frac{c+v}{c-v}} \quad (\text{Eq. } 13)$$

Once again, $v=0$ must be concluded.

Data obtained by the Ives-Stilwell experiment is from a real world, and it is these data that enable (Eq. 9) and (Eq. 12) to be empirically summarized. That $v = 0$ is so inevitably demonstrated in equation (Eq. 11) and (Eq. 13) in "witnessing" Doppler effect can only mean that the world fantasized by relativity cannot fit itself in the real world whenever $v \neq 0$ must be dealt

with. **Therefore, frequency shift can only serve as exclusive physical evidence demolishing the validity of relativity.** What should happen as revealed by (Eq. 9) and (Eq. 12) in the real world cannot happen in the world of relativity or vice versa. Although relativity's derivative work coincidentally leads to some mathematical expression to look like (Eq. 9) and (Eq. 12), ending up with $v=0$ must violate the moving status that relativity has assumed for the moving light source.

Besides the Doppler effect caused by movement between the light source and the observer, the real world has another piece of solid evidence against relativity. It is called **stellar aberration**. Stellar aberration has been conventionally regarded as one of many pieces of physical evidence encouraging the debut of relativity. However, analysis more in details finds that the conventional study has troubled itself with a speed higher than c for the propagation of light but is unaware of this error. We all know that, so far, speed higher than c for the light propagation is unacceptable by any reputable school of theory. To remove this error and restore the true nature of the light speed of c , it needs quite lengthy preparation. For this, a reader is cordially invited to visit *Relativity Is Self-Defeated (3 of 3) —Lorentz Factor, aberration, and ether*, presented in the CPNS Conference of July 20-23, 2016.

3 Reviving the Concept of Ether

We cannot imagine a third manner for the propagation of light besides these two: Light by itself is some kind of projectile, based on which is the debut of relativity, or light is something whose relocation must rely on the conveyance of something else, or the so called medium, at the expense of its own energy. Due to the failure we have seen with relativity, which assumes light as possessing the property of some kind of projectiles, we are left with only one choice, which is to view that light's relocation is involving only with energy relocation but no material, and such relocation must therefore rely on some medium.

One of the “facts” that is used as “indisputable” evidence forcing the scientific world to abandon the belief of the existence of a medium for light conveyance is the Michelson-Morley experiment. Unfortunately, if this experiment is ever devised to study “ether wind”, it can be said that it has been placed in an environment more suitable to study “air wind”. Essentially, it is a set up similar in principle to what Fizeau experiment of 1851 shows. The difference between them is that (1) the medium in the Michelson experiment is the atmosphere while the medium in the Fizeau experiment is water and (2) the speed of the medium in the Michelson experiment is zero while that in the Fizeau experiment is 7 meter/sec. If the Fizeau experiment requires a speed of 7 meter/sec for its medium, what should be the speed of the medium that is supposed to present the velocities of all “upstream”, “downstream” and “cross-stream” with respect to the apparatus in the M-M experiments, given that the atmosphere has a refractive index of 1.0003? So unfortunately, so far, the speed of medium in the M-M experiment has always been only zero.

Suppose we all were marine animals and had performed the experiment in water, the concept of a wrong agent pervading the apparatus in the M-M experiment may have been easier to be aware of.

By the way, in today's physical study, we have been made get used to a term "the constant speed of light in vacuum space". How is "vacuum space" defined? Will such a vacuum space be made free of "dark matter", neutrinos, as well as many other exotic materials? If the absolute absence of such materials cannot be guaranteed, it may be more proper for the scientific world to establish a speed value in a medium other than in a vacuum space. It is an irreplaceable principle that if there is no medium, there would be no sound. This principle should also be true for the propagation of light.

As to ether, we can consider it as a fluid, which, as an entire bulk, can serve as an absolute inertial reference for movement to be measured in the entire universe. A metaphor is like this: the water body of the earth would never go anywhere with respect to the earth; so the entire bulk of ether will not go anywhere with respect to the universe. We always say something like "the sound speed in water is 1,500 m/s" but without any frame reference attached to this statement, such as "with respect to the earth". However, any local collection of water may never be absolutely still with respect to any chosen point of the earth. Such local collection, although moving, never presents a problem for us to understand the speed of sound in water. So in the similar manner, ether, soaking entirely with the universe everywhere, should be able to offer us an absolute inertial reference frame, regardless of whether some local collection out of its entire bulk may or may not move. In other words, for example, a collection of ether may be mechanically hurled to move with the Milky Way at comparatively low speed, but the vortex thus agitated may not affect the propagation of light, which is of electromagnetism in nature.

To study how light really propagates in ether, only large distance of its traveling can present us a more complete picture. Then, stellar aberration should be ideal for the study. For this, please continue to *Relativity Is Self-Defeated (3 of 3) —Lorentz Factor, Aberration, and Ether*.

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