Second Evidence of Aether

— Ives-Stilwell Experiment

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Abstract [For a reader who is interesting in checking the first evidence of Aether, please refer to the article ***First Evidence of Aether—Newton's Gravitational Law***

(https://vixra.org/pdf/2003.0452v1.pdf)]

The science world has long claimed that the Ives-Stilwell experiment [1] is a material fact validating the concept of time dilation, which is declared in the original paper of 1905 of special relativity [2]. The reason is because such experiment is said to have confirmed the following frequency-shift equation for a moving light source mentioned in the relativity paper

$$f' = f\sqrt{\frac{c-(v)}{c+(v)}}$$

where f is the natural frequency of a light source, f' is the frequency detected by an observer, c is the speed of light, v is the speed between the source and an observer. Sign convention requires that the value of v inside the parentheses must carry a negative sign if the observer and the source are moving toward each other.

This equation appears quite different from the frequency shift equations concluded by classical Doppler effect study in which a medium for wave propagation must present. Therefore, the above equation is also conceived supporting an importing idea emphasized by special relativity, which firmly declares that the propagation of light is independent of the existence of any medium in space.

Given that special relativity must mathematically reject its own second postulate and therefore must self-refute [3], the above equation can no longer be considered as having been mathematically derived by a theory—although now concluded by an experiment. For the sake of convenience, this equation will be referred to as **Ives-Stilwell equation** in this paper.

Can this **Ives-Stilwell equation** be derived by theory? Yes! This author believes. It is what this article tries to approach.

It has long been a controversial topic whether there exists a light propagating medium in the universe's vast space. Special relativity as a theory is the most unbudgeable obstacle in blocking the recognition of such a medium. Next to special relativity, another stubborn obstacle is the concept of photon. Sadly, to the people having high faith to photon, the concept of photon is also inherently self-refuted just like special relativity.

First, special relativity bases its argument for photon on light, without which its second postulate cannot be established. If light is consisted of photons, they then must be the imperative but only material giving life to relativity's second postulate. If relativity rejects this postulate with its own calculation, it must also wrap up this material with a label of invalidity. Second, the photon's nature is said to be packet of energy. Being all packets in a moving train of light, photons must be separated between each other in space and in time measurement. Such separation means that there must be at least one extra wave propagating along with the train of light with frequency that is different from what each light packet carries. It is such wave that plays the role to "kill" the train of light every so often space-wise and timewise so that packets can be resulted. It literally means that the light wave and the "killing" wave must result in wave interference. Interference of waves must produce beat. Has anyone in the science world ever claimed that beat is an inevitable phenomenon in any beam of pure light? There is a third evidence presented in the next paragraph manifesting the self-refuted quality of the concept of photon.

Students in modern physics classrooms are all asked to accept the following idea in explaining the photoelectric phenomenon: Upon absorbing the energy and momentum from a photon shining from the anode direction, an electron from a cathode flies toward the anode, i.e., the photons fly in a direction opposite to that of the photon's movement. When the flying happens even in many cases in which the bias voltage is zero or even negative across the two electrodes, the students are still asked to take such explanation for granted. Such an explanation is pointblank in violation of the most fundamental principle of physics and thus irresponsible in physics study. It is equivalent to say that a billiard ball on a pool table, after struck by a cue, will run toward the striking cue other than away. Has anyone ever seen such inconceivable scene?

Because of the failure of the relativity, the only reliable theoretical tool left for us to study kinematics is Newtonian mechanics. Because of the invalidity of the concept of photon, we have no ground to claim that light is some material radiated by and thus separated and move away from a light source. But material does not have to be the only form for light to be conceived. Besides material, it can exist in the form of energy. Energy can be generated by a light source; the energy can be carried away by a medium if such medium is constantly available immediately next to the light source, just like sound energy being carried away by air. This reasoning of energy being generated by a source and carried away by a medium has helped us to arrive at the "classical" equations in Doppler effect study. However, they are so far applied only for waves of comparatively lower frequency, such as sound. Will the same reasoning work for high frequency phenomenon like what light shows?

Of course, if the combination of Newtonian physics and an assumption of a medium can help to arrive at the Ives-Stilwell equation concluded by experiment, this equation can in turn serves as an evidence declares the existence of the medium in our concern. Such medium is called ether by some people, or aether, or also Aether in history. In this article, it is called Aether, a term used by the ancient Greek.

Keywords: aberration, Ives-Stilwell equations, medium, mirage

Stellar Aberration

Let's start our investigation by reviewing some popular explanation on stellar aberration. The explanation conventionally has two versions. One is the relativistic version; another is the classical version. In both versions, the explanation relies on one equation, which reads as $\tan\delta = {}^{v}/_{c}$. In this equation, v is the orbital speed of the Earth, and c is the speed of light. Regardless of how the angle δ is defined in each version, simple trigonometry mandates that this equation destines the existence of a right triangle that has a hypotenuse on which something must travel at speed $\sqrt{v^2 + c^2} > c$. What is this "something"? It is certainly a discrepancy violates the relativity's doctrine that nothing can travel at speed higher than c. To cover, relativity supporters justify their explanation with the factor $\gamma = {}^{1}\!\Big/_{\sqrt{1-(v/c)^2}}$. However, with the self-refuted nature of relativity, the justification has no valid ground.

In the classical version, the speed value associated with the corresponding hypotenuse was skipped from further investigation. The mystery thus brought out was then blurred out by people in the study with words meaning approximation. Had not the classical method skipped pursuing this larger-than-c speed value associated with the hypotenuse, some accurate mathematics in explaining stellar aberration would have had a chance to be found [4] before the debut of the special relativity.

In Fig. 1a, a coordinate system X-O-Y and a motionless star are found in ABCD, where ABCD represents a deep space background and all the edges of ABCD can be extended to infinity. Speed of light c is measured with respect to this background. A rectangular block EFJK, which is at rest until a certain instant t_1, is placed in this space. The ceiling and the floor of this rectangular block are transparent. Both walls EK and FJ are open so that nothing can restrict any material moving in and out of this blue block. In all time before the moment t_1, an observer at H (black print) staying outside the block EFJK and an observer at H (purple print) staying inside the block can both see the light from the star along line L1, which is perpendicular to the ceiling and floor of EFJK. The observer at N (purple print) inside the block would not see this light.

At certain instant t_2, traveling at speed v, the block reaches where is shown in Fig 1b. AT this instant, observer H in purple no longer sees the light on L1, but observer H in black continues seeing it. The spot occupied by H in purple until t_1 is now occupied by observer N in purple, who now, however, sees the light along L2, which, leads him to see the star appearing at location b. This phenomenon is what we called aberration. Aberration is not seen by H in black. To imagine L2 being not in the vision of observer H in black, we can just simply move him along L1 but further away from the block. Indeed, at no point outside of EFJK can this observer find L2 while he can see the star light along L1 all the time regardless of how EFJK would have moved.

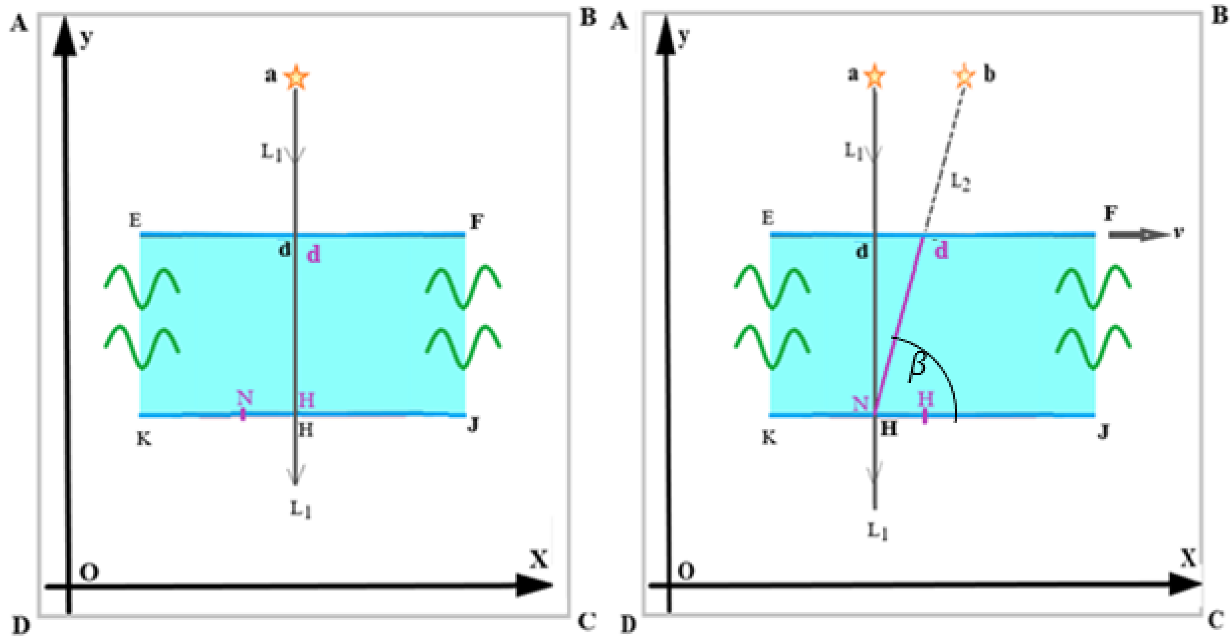


Fig. 1a EFJK at rest **Fig 1b** EFJK moving at speed *v*

Let's suppose h to be the height of the block, i.e., the distance between point d and H in Fig. 1a. For any point marked as a tip on a light ray coming from the star, the time duration Δt for it to complete the distance h would be $\Delta t = h/c$, or in our case, $t_2 - t_1 = h/c$. The angle formed by L2 and the floor of EFJK can be determined by the following equation:

$$\sin\beta = \frac{c}{\sqrt{c^2 + v^2}} \qquad (Eq\ \ 1)$$

If h is exactly equal to one wavelength of the light measured on L1, the period for the light tip to complete the journey from d (black) to H (black) is the same as the journey from d (purple) to H (purple).

The term $\sqrt{c^2 + v^2}$ in Eq.1 is not to imply that the light from the star has changed its property and become more energetic and thus able to move faster than the light's normal speed c. It is only to mean that energy contributed by the movement of the EFJK block has enabled longer loci to be traced out by the same tip of light on the block. Any point found on the light beam hitting the ceiling and entering the block can be considered a tip for the light beam following behind. The star image at b that the observer at N (purple) sees along N (purple) and d (purple) is an illusion to him because there is no light on the bd (purple) segment on L2. What makes him see the light is the light moving on L1, which has an invariant speed c. If the distance between d in black and H in black equals one wavelength, it means the distance between d in purple and N in purple is also one wavelength but with a different value. It is easy to conclude that it takes the same time amount for both wavelengths to be completed by the same light beam's traveling.

The above analysis would stay the same regardless of the height of the block. This equivalently tells us that for any observer moving in a direction that forms a nonzero angle with the light propagation, aberration is an inevitable phenomenon, regardless of his observation facility, either a piece of long barrel telescope or directly, if *h=0*, the cornea of the observer's naked eyes.

In Fig. 3a, a moving flashlight is sending light wave to the light interceptor in such an order: segment *w1* is sent at instant *t1*, then *w2* at *t2*, and *w3* at *t3*. For clarity, each segment sent is presented on a different line, but actually they all propagate on the same line as what is shown at the bottom of the same figure. It is true that each wave segment propagates at speed *c*. However, due to the movement of the flashlight, when the interceptor receives them, they are seen by the interceptor as having crowded together as if they had been traveling at speed not equal to *c*. Aberration occurs. In comparison, in Fig 3b, the same wave segments are sent by a motionless flashlight. When received by the interceptor, the time separation between the segments represents their genuine physical parameter of traveling: the distance between them is truly equal to $c \times (t_2 - t_1)$ for w1 and w2, or $c \times (t_3 - t_1)$ for w3 and w1. No aberration is detected by the interceptor in Fig. 3b. Therefore, essentially, that aberration is seen is because the interceptor is fooled into detecting light traveling at speed other than *c*.

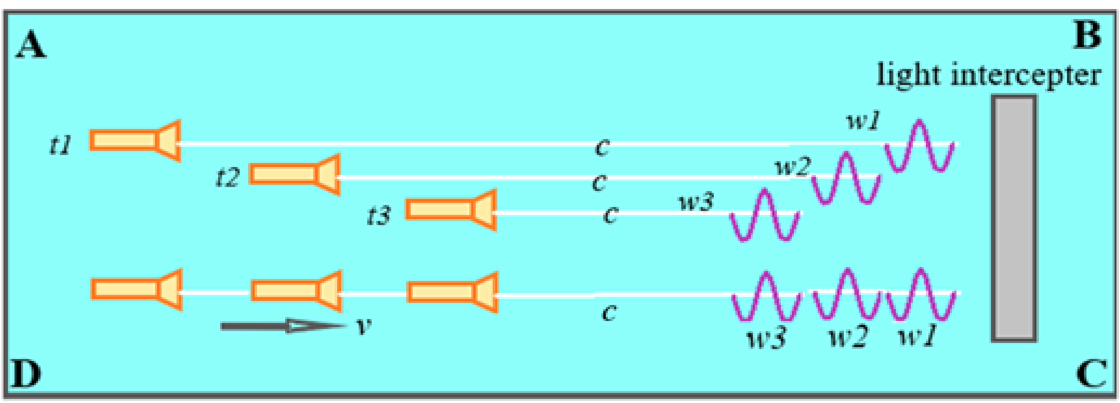


Fig. 3a

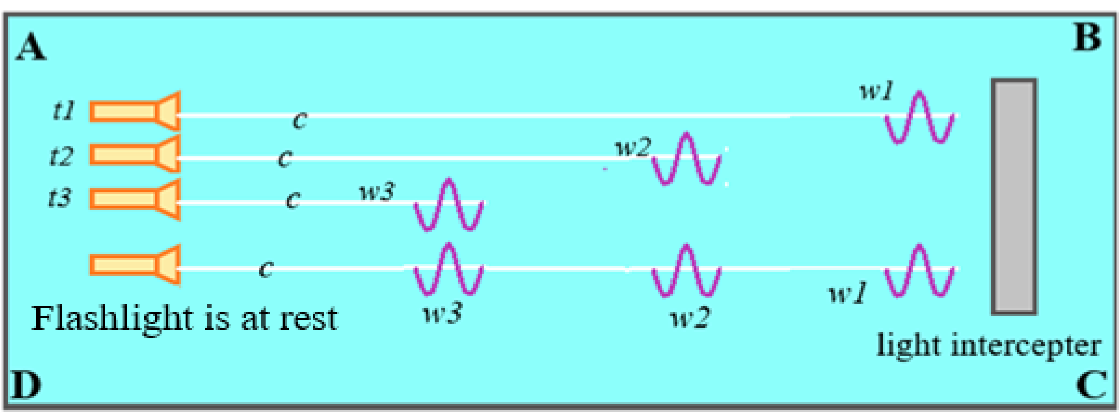


Fig. 3b

At this point, it is worthwhile for us to review one famous “mental experiment” with which special relativity supporters promote their concept of time dilation. Their conclusion from the experiment is that the determination of simultaneity between two events is dependent upon the speed of a moving observer with respect to the event locations, or the speed of the event locations with respect to the observer. Since such discussion is not critical in affecting our discussion on aberration, but the concept of time dilation is said related to frequency shift by relativity, the discussion is presented in appendix 1 at the end of this paper. The appendix clearly tells us how the mental experiment has been wrongfully devised and visualized.

Mathematical Approach of Frequency-Shift in Aberration

In Fig. 1b, on the path Nb leading to the discovery of the apparent position of the light source, only the Nd section has light presenting, while in the other section db light is absent. Simply, if some photochemical sensitive material is placed in the path of Nd, light can cause the material to react, but not so in the “path” of db. If the distance between the star and N is |Na| = *s*, the distance from the star’s apparent location b to point N would be

$$|\mathrm{Nb}| = \frac{s}{\sin\beta} = \frac{s\sqrt{c^2+v^2}}{c} \qquad (Eq.\ 2)$$

Eq. 2 simply tells us that, because of aberration, a light detector would always conceive an *instantaneous image* of the moving light source existing at a distance different from the actual distance on which the true source is found. That the word “instantaneous” is used is because no light is ever spending any time traveling on path db and therefore image at b is an instantaneous twin brother of the true star. We are going to call the light path Nd(purple) a mirage path.

In Fig. 4, the star light beam enters the moving block at an angle of δ. If the block is motionless, this beam should move along EJ. The movement of the block results in a horizontal component c_X for the observer at H moving with the block, and therefore he sees the beam move along line EH (traced and recorded in his block), which is equivalent to line N-d (purple) in Fig. 1b. From ΔEKH, we have

$$|EH|^2 = |EK|^2 + |KH|^2 - 2|EK||KH|\cos\emptyset \qquad (Eq.\ 3)$$

In case $\emptyset = 180^\circ$, or equivalently δ= 0°, we have

$$|EH| = |EK| + |KH| \qquad (Eq.\ 4)$$

δ= 0° is a situation in which the observer and the light source approach each other facing on.

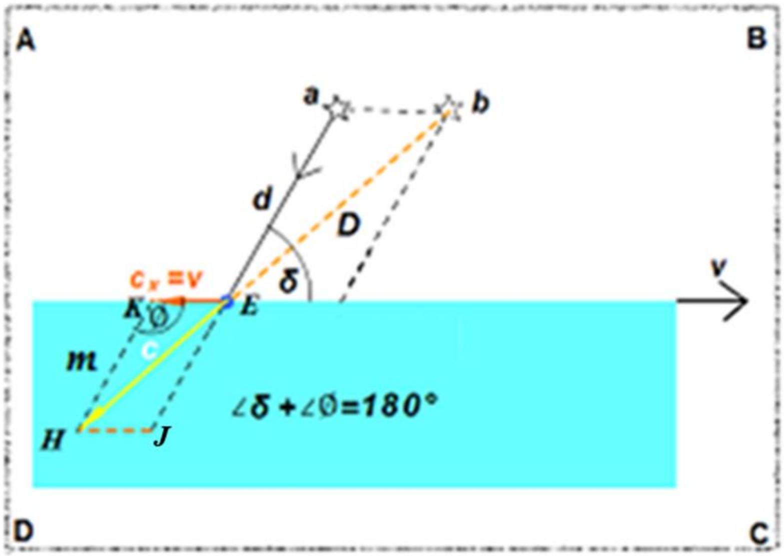


Fig. 4

If it happens that $|EJ| = \lambda$, i.e., $|KH| = \lambda$, where λ is one natural wavelength, we will have

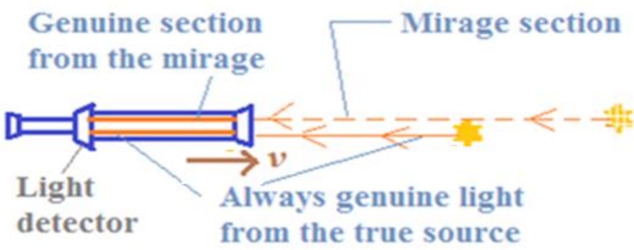
$$|EH| = |EK| + \lambda = vt + \lambda \qquad (Eq. \quad 5)$$

where t is the time that the light needs to cover the movement of one wavelength λ. Such time needed is exactly one period P ($= {}^{1}/_{f} = {}^{\lambda}/_{c}$), and therefore we further have

$$|EH| = \lambda + \frac{v}{c}\lambda = \frac{\lambda(c+v)}{c} > |EJ| \qquad (Eq. \quad 6)$$

Since EJ equals one wavelength, EH should also correspondingly be one wavelength but belonging to a wave train of different frequency due to the fact $|EH| > |EJ|$. For any value of angle of δ other than $\delta = 0^{\circ}$, after striking at point E in Fig. 4 and entering the block, the path on which the light is seen, i.e. EH, must separate from the path that is an extension of line aE, the original light path. However, the separation will not happen if $\delta = 0^{\circ}$. Rather, now, the mirage light path, represented by EH, and the extension line of aE, represented by EJ, must forever merge in the same direction. For all $\delta > 0^{\circ}$, the mirage portrayed as the star at *b* can stay in the detector's interception for only a limited time. For $\delta = 0^{\circ}$, the mirage can stay in the detector's interception for as long as no collision happens between the detector and the light source. Of course, now, EJ is also a path but occupied by the original light of frequency f. Now, we have a case in which an observer is approaching a light source along EJ. According to what is given by the classical Doppler analysis, the frequency f_1 impinged on the eye piece of a telescope approaching the source is:

$$f_1 = f\,\frac{c+v}{c} \qquad (Eq. \quad 7a),$$



The two light paths should have merged as one in reality. They are separated here for illustation purpose

Fig. 5

and the wavelength corresponding to and measured with respect to the *frame at rest with the light detector* is

$$\lambda_1 = \lambda \frac{c}{c+v} \qquad (Eq. \quad 7b)$$

However, besides the light directly from the true star, the detector also receives light from the mirage path (Fig. 5). Eq. 8 shows that the wavelength of the beam associated with mirage source is longer than the true beam's wavelength by a length of $v\lambda/c$. The problem is that if it happens that the true beam disappears after completing one wavelength of traveling, the mirage beam of longer wavelength but parasitic on this true beam must follow the true bean and disappear instantly. In other words, when the true light completes one wavelength, the parasitic beam must have also completed one wavelength. Given that the light speed with respect to the deep space is invariantly *c*, the longer wavelength so shortened in effect can only seem that the extra wavelength $v\lambda/c$ is canceled by the "advancement" of the mirage "source" at speed v toward the detector. So, parallel to the classical Doppler effect analysis, in which a source is moving toward the observer, the frequency f_2 received by an observer is:

$$f_2 = f \frac{c}{c-v} \qquad (Eq. \quad 8a)$$

and the wavelength λ_2 matching f_2 is

$$\lambda_2 = \lambda \frac{c-v}{c} \qquad (Eq. \quad 8b)$$

Now, we may imagine that what the detector receives is a mixture of f_1 and f_2. However, some mechanism prevents a mixture of two frequencies from happening. (1) Among the two wave trains, one is a dominant one, and another is parasitic on the dominant one. (2) The parasitic one, being a light path representing a mirage source, has no its own energy source and cannot cause wave interference. (3) Powerless as the parasitic one, though, the dominant wave train in its own portraying cannot hide the frequency of the inevitable parasitic slave.

If we compare between f_1 and f_2 , we find $f_2 > f_1$, because

$$\frac{f_1}{f_2} = \frac{\frac{c+v}{c}}{\frac{c}{c-v}} = \frac{c^2-v^2}{c^2} \qquad (Eq. \quad 9)$$

Subsequently, we also have $\lambda_2 < \lambda_1$.

Exactly right before the instant $\delta = 0^{\circ}$ happens, from Fig. 4, we realize that EJ is not occupied by light. It is only used as a tool of length comparison in our analysis. At the very moment of the happening of $\delta = 0^{\circ}$, EJ becomes the path of the true light. The true light and the mirage light merge. If only one single frequency is displayed after the merging, it must mean that both λ_1 and λ_2 are "seen" by the detector as having begun and ended at the same instance together. This further means that light completes both wavelengths with the same time duration, or period p. This can be realized if light has different speeds to have each different wavelength completed.

Overall, we say that speed of light is the same, but this is concluded with respect to the reference frame of deep space. With respect to the reference frame of the light detector, as we mentioned before, light can be seen as arriving at different speed, depending on the relative movement between the sources and the detector. Now, what the detector sees is a composite of light of two components: one represents a true source, and the other one a mirage source.

Suppose the only single frequency the detector presents covering both f_1 and f_2 is f_c with a corresponding wavelength λ_c. To realize what is illustrated in the above paragraph about how different wavelengths are completed in the same period, we must have

$$\frac{\lambda_1}{v_1} = \frac{\lambda_c}{v_c} = \frac{\lambda_2}{v_2} = p \qquad (Eq. \quad 10)$$

where v_1 is the speed of light for completing the wavelength λ_1, v_c for λ_c, and v_2 for λ_2. The only speed value that v_c can take to make both equal signs in Eq. 10 simultaneously hold is

$$v_c = \sqrt{v_1 v_2} \qquad (Eq. \quad 11)$$

Eq. 10 and Eq. 11 can lead us to have

$$\frac{\lambda_c}{p} = \sqrt{\frac{\lambda_1}{p}\frac{\lambda_2}{p}}$$

$$\lambda_c = \sqrt{\lambda_1 \lambda_2}$$

$$= \sqrt{\lambda \frac{c}{c+v} \cdot \lambda \frac{c-v}{c}}$$

$$= \lambda \sqrt{\frac{c-v}{c+v}} \qquad (Eq. \quad 12)$$

Because of $c = f\lambda$, Eq. 12 thus leads to

$$f_c = f\sqrt{\frac{c+v}{c-v}} = f\sqrt{\frac{c-(-v)}{c+(-v)}} \qquad (Eq. \quad 13)$$

Eq. 13 is the identical expression of the **Ives-Stilwell equation** shown in the beginning of the abstract. Now, a theoretical derivation is arrived at.

At the first glance, it appears that the two equal signs of Eq. 10 can also simultaneously hold if we had taken $v_c = {}^{v_1 + v_2}/_2$. The problem is that we have an energy issue if we did that.

The energy *E* that a light beam carries has the following relationship with its frequency f:

$$E = Kf \qquad\qquad (Eq. \quad 14)$$

(A constant coefficient *K* is used here to avoid the discussion of Plank constant *h*.)

If the ultimate single light beam containing both f_1 and f_2 has a total energy of E_T, and if we assume $v_c = {}^{v_1 + v_2}/_2$ to represent the speed of this single beam that has frequency f_c and wavelength λ_c, then we will have

$$E_T = Kf_c = K\frac{v_c}{\lambda_c} = K\left(\frac{v_1}{2\lambda_c} + \frac{v_2}{2\lambda_c}\right) = Kf'_1 + Kf'_2 \qquad\qquad (Eq. \quad 15)$$

where f'_1 is used to signify a frequency differing from $f_1(= {}^{v_1}/_{\lambda_1})$, so is f'_2 to $f_2(= {}^{v_2}/_{\lambda_2})$.

Eq. 15 indicates E_T having two energy terms. When one of the two frequencies is zero making the corresponding term zero, the other term still stays as non-zero. This would physically suggest that E_T is a composite of energy that is sent from two independent light sources. But it has never been that case in our entire discussion. Contrary to $v_c = {}^{v_1 + v_2}/_2$, with $v_c = \sqrt{v_1 v_2}$, we will have

$$E_T = Kf_c = K\frac{v_c}{\lambda_c} = K\sqrt{\frac{v_1 v_2}{\lambda_1 \lambda_2}} = K\sqrt{f_1 f_2} \qquad\qquad (Eq. \quad 16)$$

In Eq. 16, if either f_1 or f_2 becomes zero, E_T must become zero. That f_1 becomes zero means the light source disappears; that f_2 becomes zero means no aberration existing. We know that E_T is an energy quantity dominantly sustained by one source but also modified due to the contribution of movement of the observer's frame.

The consideration of the energy issue involved here is a good example in physics study whether we should let physics determines how mathematics is used as a tool or we should let mathematics determines how the physical world is to exist as a subordinator of mathematical assumption.

For the aberration produced by a light source approaching the observer, the outcome is the same as the observer approaching the source. The analysis is not to be repeated here, because the reasoning procedure is the same although there should be some slight difference in technique.

Now, let's study the situation in which the light source and the observer move away from each other.

As illustrated in Fig. 6, when the star and the observer move away from each other, the mirage image of the star should be between the observer and the true star. Similar to the analysis given by Fig. 4, the velocity component resolving diagram inset in Fig. 6 gives us the following equation

$$|EH|^2 = |EK|^2 + |KH|^2 - 2|EK||KH|\cos\delta \qquad (Eq.\quad 17)$$

When the incident angle equivalent to that of δ in Fig. 4 takes the value $\delta = 0^\circ$, we will have what is suggested in Fig. 7 and thus the following relationship

$$|EH| = |KH| - |EK| = |EJ| - |JH| \qquad (Eq.\quad 18)$$

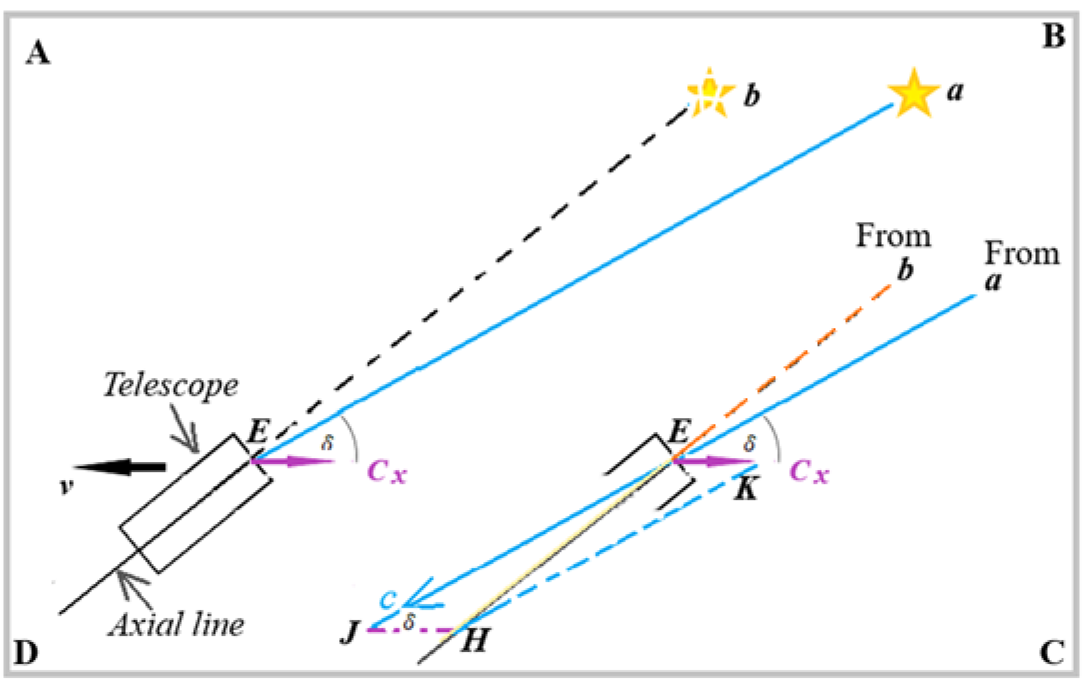
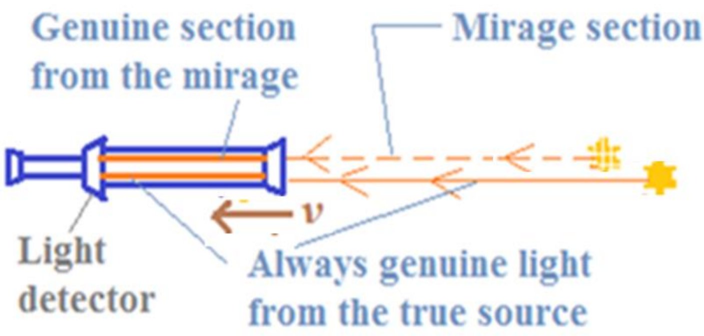


Fig. 6



The two light paths should have merged as one in reality. They are separated here for illustation purpose

Fig. 7

Similar to the analysis given by Fig. 4, taking $|EJ|$ as one wavelength, we have the following relationship

$$|EH| = \lambda - \frac{v}{c}\lambda = \frac{\lambda(c-v)}{c} < |EJ| \quad (Eq.\ \ 19)$$

Now, plainly, what we have is a situation in which an observer moves away from the light source. According to what is given by the classical Doppler analysis, the frequency f_3 thus impinged on the eye piece of a telescope by the light source getting away along EJ should be:

$$f_3 = f\,\frac{c-v}{c} \quad (Eq.\ \ 20a)$$

with a corresponding wavelength

$$\lambda_3 = \lambda\frac{c}{c-v} \quad (Eq.\ \ 20b)$$

Eq. 19 shows that the wavelength of the beam associated with the mirage source on EH is shorter than the true beam's wavelength by a length of $^{v\lambda}/_{c}$. However, the mirage beam would have to disappear only at the instance the true beam completes one wavelength and disappears. This needs the parasitic wavelength to seem in effect having extended to get equal to that of the master's wavelength. This, in effect, requires the mirage source moving away from the detector with a speed of v. So, parallel to the classical Doppler effect analysis about a source moving away from an observer, the frequency f_4 detected by the observer along path EH should be

$$f_4 = f\frac{c}{c+v} \quad (Eq.\ \ 21a)$$

with a corresponding wavelength

$$\lambda_4 = \lambda\frac{c+v}{c} \quad (Eq.\ \ 21b)$$

As analysis in the previous case, the no-mixture and no-interference of two wave trains require the wavelength λ_3 and λ_4 to begin and end during the same time duration as if they all have come to a common wavelength λ'_c. This can be achieved if the light completing λ_3 and λ_4 can travel at different speeds as shown in the following equation so that they both can surrender to one common wavelength λ'_c.

$$\frac{\lambda_3}{v_3} = \frac{\lambda'_c}{v'_c} = \frac{\lambda_4}{v_4} = p \qquad (Eq. \quad 22)$$

where v_3 is the speed for light to complete the wavelength λ_3, v'_c for λ'_c, and v_4 for λ_4. To have both equal signs hold simultaneously in Eq. 22, we will come up with the only solution for v'_c shown as

$$v'_c = \sqrt{v_3 v_4} \qquad (Eq. \quad 23)$$

Eq. 23, leads us to

$$\frac{\lambda'_c}{p} = \sqrt{\frac{\lambda_3}{p}\frac{\lambda_4}{p}}$$

$$\lambda'_c = \sqrt{\lambda_3 \lambda_4}$$

$$= \sqrt{\lambda \frac{c}{c-v} \cdot \lambda \frac{c+v}{c}}$$

$$= \lambda \sqrt{\frac{c+v}{c-v}} \qquad (Eq. \quad 24)$$

or correspondingly,

$$f'_c = f \sqrt{\frac{c-v}{c+v}} \qquad (Eq. \quad 25)$$

Eq. 25 is the identical expression of the **Ives-Stilwell equation** shown in the beginning of the abstract but for red shift movement.

As a matter of fact, Fig. 7 would suggest to us that all images of stars we pick up with red shift in the astronomical telescope are actually the mirage of the stars resulted by aberration. The actual location of a star is farther from us than what the telescope makes us believe. Suppose the actual distance of the star from us is S, and the corresponding distance the telescope makes us believe is S', then we should have the following relationship from Fig. 6 when $\delta = 0^\circ$,

$$\frac{|EJ|}{|EH|} = \frac{S}{S'} \quad , or \quad S = S' \frac{|EJ|}{|EH|} \qquad (Eq. \quad 26)$$

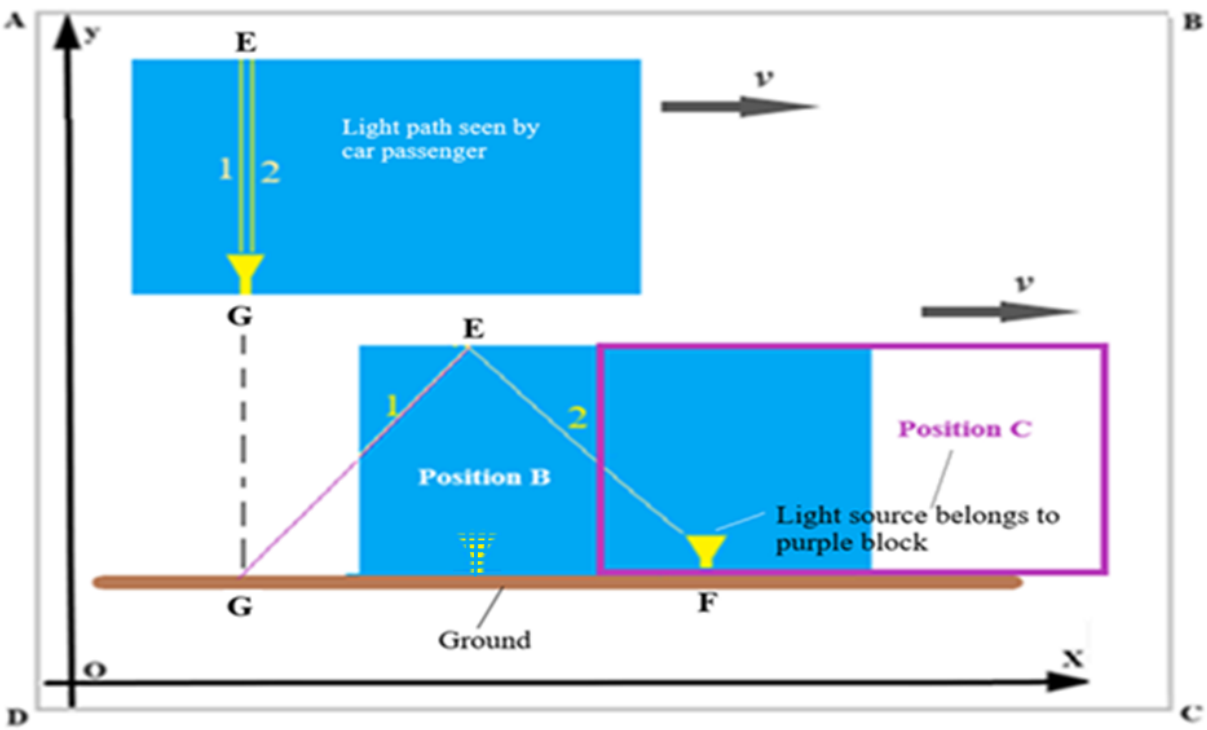
If EJ is to represent one wavelength, the value EH should be taken what it should be immediately before $\delta = 0^{\circ}$ happens. Right before $\delta = 0^{\circ}$ happens, we have $|EH| = {}^{\lambda(c-v)}/_{c}$. Taking $|EJ| = \lambda$, Eq. 26 would give us

$$S = S' \frac{\lambda}{\frac{\lambda(c-v)}{c}} = S' \frac{c}{c-v} \qquad (Eq. \quad 27)$$

It is said that the most remote heavenly bodies at the edge of the visible portion of the universe are receding from us at speed of $0.1c$. This will give us $S = 1.11S'$.

Of course, stars with blue shift will not raise the same concern to us.

Appendix 1



Position B is where the block is seen by the ground observer when the light reaches E;
Position C is where the block is seen by the ground observer when the light reaches F;
F and G **are identically the same spot in the view of the passenger**

Fig.8 A View Conceived by Special Relativity

Fig 8 represents a famous mental "experiment" for relativity promoters to convince people to accept the concept of time dilation. Inside the upper blue car block, a passenger at G sends vertically the flashlight beam 1 toward the ceiling. It is conceived to land at point E on the ceiling, then this beam is reflected as beam 2 back to him. This vision means that beam 1 and beam 2 share the same path GE. If the car block is moving, however, conceived by relativity, the ground observer will not see these two beams share the same path, but instead, they will travel on different paths, as shown in the lower blue block and later the purple block in Fig 8. Due to the movement of the car, by the time beam 1 reaches E, E must be seen by the ground observer a distance away from line G-G-E that is "printed" on ABCD. Therefore, according to relativity, the ground observer can claim that the GE line recorded on ABCD must be seen longer than the GE marked on the car and seen by the passenger.

Possibly, whoever devised the above "mental experiment" may want to change his mind if he is asked what if the height of the ceiling is something like one light-year. Then, by the time the tip of the beam reaches the ceiling, nothing can guarantee it would land on point E on the ceiling. But instead, the light should land on some point S on the ceiling as shown in Fig 9b. Such scene of landing on S should be the same to both observers. The reason is simple. By the time the light is emitted, an infinitely long straight line represented by G-E-N in Fig. 9a is already designated in space because of the condition "a passenger at G sends *vertically* the flashlight beam 1 toward the ceiling." What portion of this line will be occupied by light is only a matter of time. Due to the movement of the car, after a while, the same straight line cannot intersect the ceiling at the same point E, but another marked point S on the same ceiling. If the experiment deviser still insists the

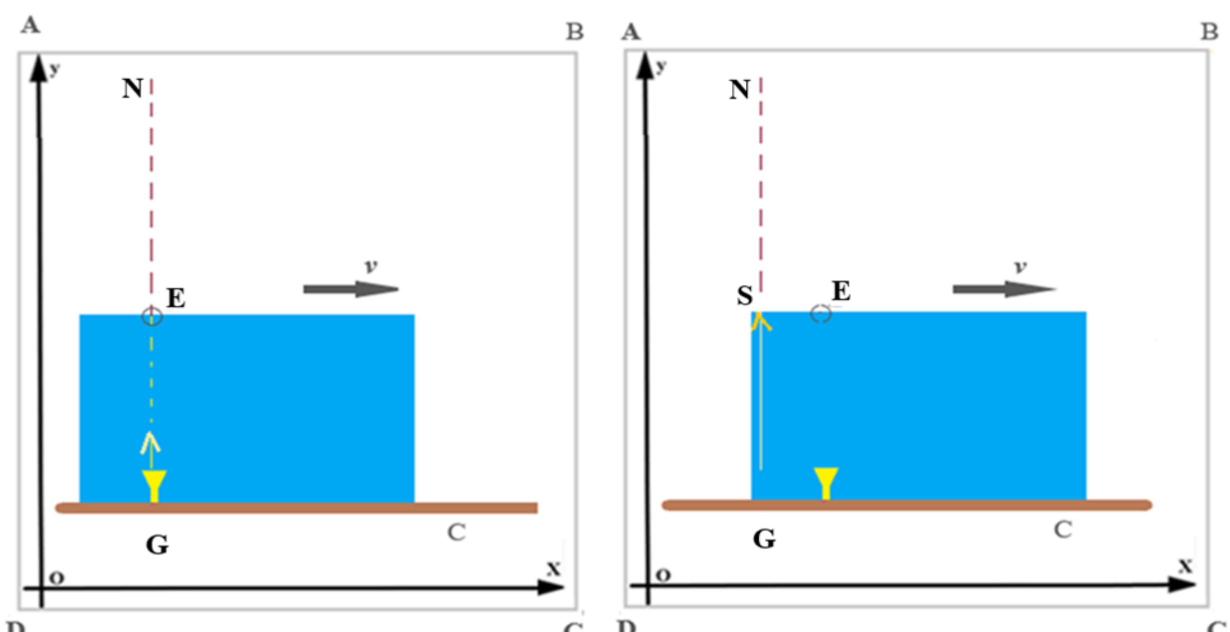


Fig 9a Fig 9b

If the ceiling is semi-transparent, there is no reason why the light cannot continue to move along line EN upon reaching the ceiling. Obviously, the light in solid line then cannot penetrate the ceiling at E but at S

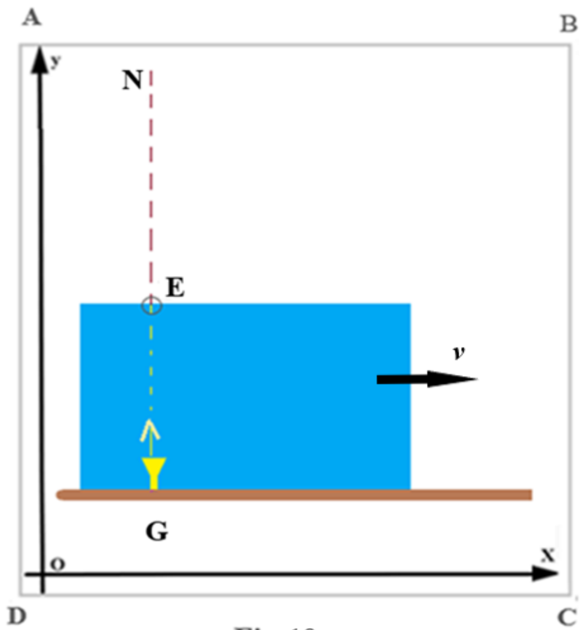


Fig 10a

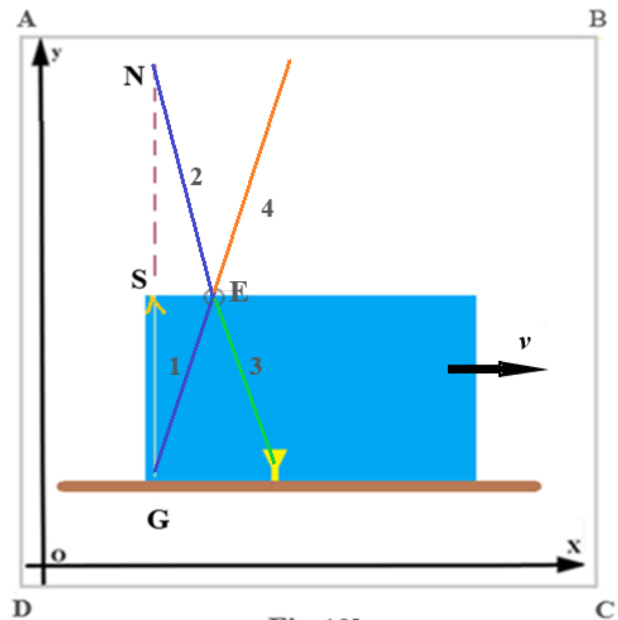


Fig 10b

light must land on E after the movement of the car, he is obliged to clear the following questions regarding the view presented in Fig 10.

(1) If the light must be seen by both observers landing on E, light path 1 in Fig 10 b must be a common view by the passenger and the ground observer. Then, how correct is the view presented in the top car block in Fig. 8a, which assumes the light beam returns exactly back to where the light bulb dwells.

(2) If the ceiling is semi-transparent, light on path 1 will penetrate the ceiling and continue to travel in space. Will path 2 be a correct path for the light's continuation, or should the light shift its path back to go along the previous G-E-N or now the G-S-N?

(3) Path 1 and 3 are in the ground observer's view. Since the ceiling is semi-transparent, light along path 1 should also partly penetrate the ceiling and continue in space along path 4. However, light path 1 is also now in the passenger's view. If so, should the passenger also see light moving along path 4?

So many uncertainties! However, all just source from something called mental, but not physical, experiment.

Why should physics as a science be so abused by our "intelligence"? Subsequently, must the physical world succumb to our superstition commanded by our faith on "science"? Or more directly, should the physical world be made succumb to our superstition commanded by our faith veiled with "science"? But, because of what?

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