Constancy of the Speed of Light without Relativity of Space and Time

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Abstract

Albert Einstein was right when he proposed the constancy of the speed of light regardless of motion of the source and motion of the observer. The constancy of the speed of light follows directly from the non-existence of the ether. However, Einstein's principle of relativity of space and time, which was derived from the light postulate and the principle of relativity, was wrong because: 1. it led to many paradoxes, and 2. absolute motion has been detected in other experiments. Special relativity was therefore a wrong interpretation of the light postulate. This paper provides a new insight that reveals the deep mystery underlying the many mutually contradicting light speed experiments. The new theory, known as Apparent Source Theory, states that the speed of light is constant and absolute motion exists at the same time. The speed of light is fundamentally constant *relative to the observer* but appears to be variable when measured. At the heart of Apparent Source Theory is *the (one-way and two-way) constancy of the speed of light regardless of motion of the source, motion of the observer, motion of the mirror, for uniform velocity or acceleration*.

Introduction

Albert Einstein in his 1905 paper stated that the speed of light is constant independent of the velocity of the source as the second postulate of special relativity. Together with the first postulate (the principle of relativity) this leads to the constancy of the speed of light for all observers, regardless of their velocity. This is also stated as constancy of the speed of light in all inertial reference frames by interpreting 'observer' as 'reference frame'.

The constancy of the speed of light for all observers is a correct conclusion which directly follows from the failure of ether drift experiments, known as first order and second order experiments, to detect the ether. The ether has been disproved by the null result of the first order Arago and Airy star light refraction and aberration experiments, and by the "null" result of the second order Michelson-Morley experiment. Modern Michelson-Morley experiments using optical cavity resonators are known to give complete null results. The independence of the speed of light from the velocity of the source has also been established in many experiments.

However, several experiments also exist that have detected absolute motion such as the Miller experiments, the Marinov experiment, the Silvertooth experiment, the CMBR anisotropy experiment and the Roland De Witte experiment.

This is a contradiction that has mostly not been recognized by mainstream and dissidents alike. There is no doubt that the Michelson-Morley experiment has disproved the ether. The Michelson-Morley experiment was designed to detect the ether and was capable to detect the ether if the ether existed. Attempts were made to save the ether such as by complete ether drag by the Earth. However, this has been disproved by the Marinov experiment, the Silvertooth experiment and also by the phenomenon of stellar aberration.

The only ether drift experiment known to have given positive results at the time of Einstein was the Miller experiments which were an elaborate repetition of the Michelson-Morley experiment. Miller observed small but consistent fringe shifts always pointing in the same direction in space and with sidereal correlation. However, the fact that the observed fringe shifts were much smaller than expected was an excuse to ignore those results as “noise” or temperature artifacts, although these have no known correlation with sidereal time or connection with fixed direction in space. It was in 1976 that absolute motion was unambiguously detected by Stephan Marinov and in 1986 by the Silvertooth experiment.

As if all these contradictions were not enough, another less known experiment contradicts not only Einstein’s constant light speed postulate, but also ether theory. This experiment appears to confirm the emission (ballistic) theory. This is the Venus planet radar range data anomaly which was analyzed and exposed by Bryan G Wallace. Ironically, the Shapiro experiment was designed to test Einstein’s gravitational ‘time dilation’. Radar pulses were sent to Venus and reflected back to Earth at a time when the Earth, the Sun and Venus were on a straight line so that the radar pulses could pass through Sun’s gravitational field. Far from confirming gravitational time dilation, the time delays agreed with ballistic theory of light in which the speed of light depended on mirror velocity.

The Sagnac effect, together with the Michelson-Morley experiment, is another phenomenon that has confounded physicists for one hundred years. The Sagnac effect is perhaps the most challenging of all light speed experiments because it involves acceleration when scientists cannot understand the behavior of light even for uniform velocity.

I will present a new theory of absolute motion and the speed of light. The new theory, known as Apparent Source Theory (AST) , reveals the deep mystery underlying all these experimental results. Apparent Source Theory resolves the contradiction between experiments implying constancy of the speed of light and experiments implying non-constancy of the speed of light.

According to Apparent Source Theory [1][2], absolute motion exists and the speed of light is constant at the same time. The constancy of the speed of light (both one-way and two way) *relative to the observer* is at the heart of Apparent Source Theory, according to which the speed of light (phase velocity and group velocity) is constant regardless of motion of the source, motion of the observer, motion of the mirror, for uniform or accelerated motion. The speed of light is fundamentally constant, but the measured speed of light *appears* to be variable. Animation of Apparent Source Theory has been uploaded on Youtube [3] .

Einstein rightly postulated the constancy of the speed of light, but gave it a wrong interpretation as relativity of space and time.

Apparent Source Theory

Consider a light source and an observer both on an absolutely moving platform, such as a spaceship. The distance between the source and the observer is D.

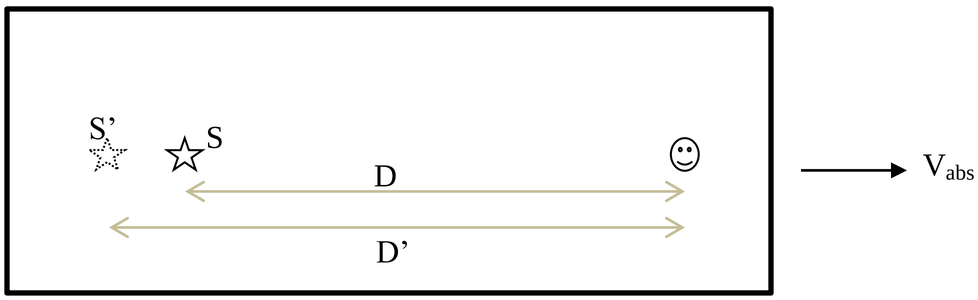


Fig.1

At first assume that the spaceship is at absolute rest. Everyone agrees that a short light pulse emitted by the source will be detected at the observer after a time delay of $T = D/c$, where c is the speed of light. The problem arises when the spaceship is in (absolute) motion.

If this experiment was about the speed of sound (Fig. 2) , sound emitted from the source will take time $T = D/ (c - V)$ to catch up with the observer, where c is the speed of sound relative to air in this case. It will take sound longer time to catch up with the observer because the speed of sound will be smaller (c – V) relative to the observer than if the sound source and observer were both at rest relative to air.

Note in the sound speed analogy above that the platform is not a closed one, but an open one in which the sound source and the observer are directly exposed to the relative wind due to motion of the platform, as shown below.

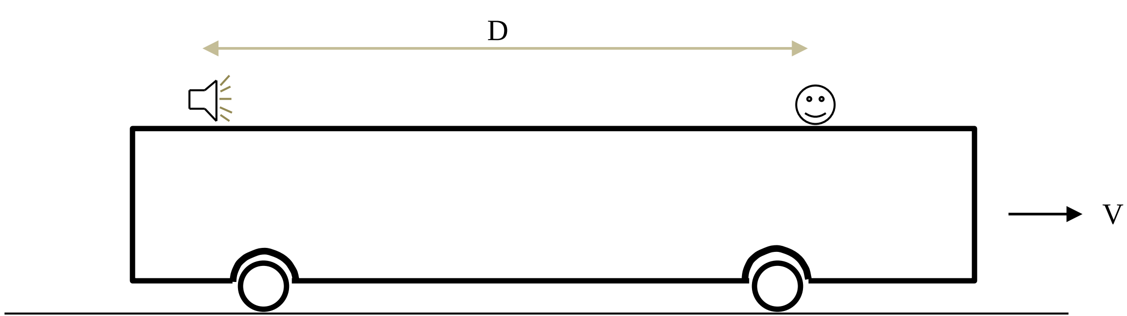


Fig.2

Now let us go back to the light speed thought experiment (Fig. 1) . In the case of light also, like for sound, light will take more time to reach the observer, with $T = D/ (c - V_{abs})$. At this point, however, we make the new and crucial distinction that, unlike the case of sound, this is *not because of lower velocity of light relative to the observer*. It is because of *an apparent change of source position relative to the observer*. The effect of absolute motion of the spaceship is to cause an apparent change of the position of the source relative to the observer.

Let me try to clarify this subtle and elusive behavior of light in another way. We will start by assuming that emission (ballistic) theory of light to be correct. In this case, the time interval between emission and detection of light will always be $T = D/c$, regardless of any uniform velocity of the spaceship. But we know that T changes with change in velocity of the spaceship, that is $T = D/ (c - V_{abs})$. How is it possible to modify emission theory to agree with this result ? The simple trick is to retain emission theory but changing the position of the source to account for absolute velocity of the spaceship. The source position is now at S', not at S, with $D' = D\ c / (c - V_{abs})$. Since light is assumed to be emitted from S', not from S, the time *T* will be obtained by dividing the apparent distance *D'* by the constant speed of light *c*. Therefore,

$$T = \frac{D'}{c}$$

But,

$$D' = D\ \frac{c}{c - V_{abs}}$$

Therefore,

$$T = \frac{D'}{c} = \frac{D\ \dfrac{c}{c - V_{abs}}}{c} = \frac{D}{c - V_{abs}}$$

Therefore, we have been able to explain the change in *T* with velocity of the spaceship without requiring non-constancy of the speed of light. Relativists assert the constancy of the speed of light but can't figure out how to explain that other than by relativity of space and time, which has led to many paradoxes. Supporters of ether theory, on the other hand, wrongly interpret the change in time *T* with velocity of the spaceship as evidence for non-constancy of the speed of light.

Therefore, the procedure of analyzing the experiment is:

1. Replace the real source with an apparent source. This means that we assume the distance of the source to be D', not D.
2. Analyze the experiment by assuming that the speed of light is constant relative to the observer, and also constant relative to the (apparent) source since the (apparent) source and the observer are at rest relative to each other in this case.

Now let us modify the thought experiment by adding a mirror M.

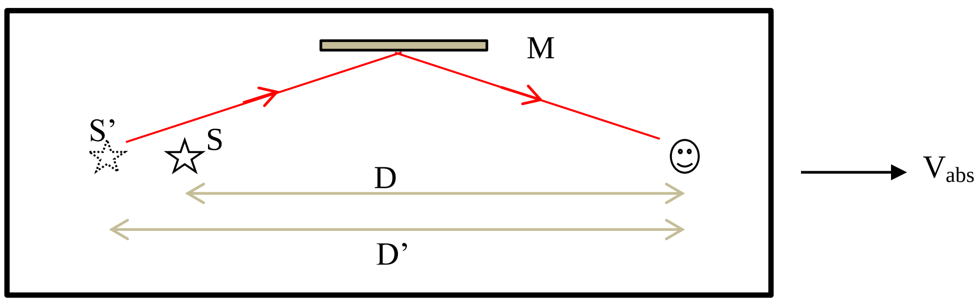


Fig.3

We have seen the effect of absolute motion of the spaceship on the light coming to the observer directly from the source. How does absolute motion affect light coming to the observer after reflection from a mirror, according to Apparent Source Theory ?

According to Apparent Source Theory, for a spaceship in absolute motion, light is assumed to originate from apparent source S', not from the real source S, for light reaching the observer after reflection from the mirror. Apparent Source Theory, as its name suggests, states that absolute motion apparently changes the position of the source only and the mirror is assumed to be at its actual, physical position. This completely avoids all the confusions that have prevailed by considering motion of the mirror relative to the ether. Therefore, light is emitted from apparent source S' , reflected from the mirror and goes to the observer. The apparent source is considered equally as a real source in all analysis. Therefore, for example, light coming from the apparent source reflects from the mirror according to the principle of equality of angle of incidence and angle of reflection, just as for light from a real source. One way to look at this is to imagine virtual light rays coming from a virtual source S'.

Apparent Source Theory and the Michelson-Morley experiment

We reformulate Apparent Source Theory as follows, with respect to the Michelson-Morley experiment. Consider the Michelson-Morley experiment shown below.

The <u>*effect*</u> *of absolute motion of the Michelson-Morley experiment is to create an apparent change of the position of the light source relative to the detector. This apparent change in source position will create a (small) fringe shift as if it is an actual, physical change of source position.*

The procedure of analysis of the Michelson-Morley experiment is:

1. *Replace the real source with an apparent source. The apparent source position is determined by the magnitude and direction of absolute velocity, the direct source-observer distance and the orientation of source-observer line with respect to the absolute velocity direction.*
2. *Analyze the experiment by assuming that the speed of light is constant relative to the observer.*

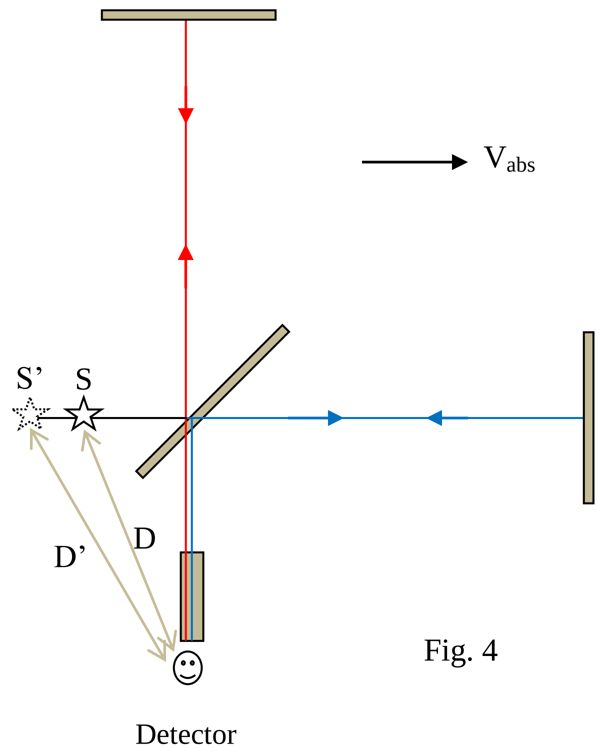


Fig. 4

The easiest and best way to present Apparent Source Theory is to ask the question: what is the effect of actually, physically changing the position of the light source (instead of setting it in absolute motion) slightly on the interference fringes ? For example, what is the effect of actually moving the light source slightly backwards (to the left), as shown above, on the interference fringes ? Obviously, there will not be any fringe shift because, intuitively, both the longitudinal and transverse light beams will be affected (delayed) identically. There will not be any fringe shift also if the source is slightly moved forward (to the right) because both light beams will be advanced equally. There will be a small fringe shift for other positions of the source, for example if the source is moved upwards or downwards, as shown below. This is because, in this case, the path lengths of the transverse beam (red) and the longitudinal beam will differ slightly [1][2].

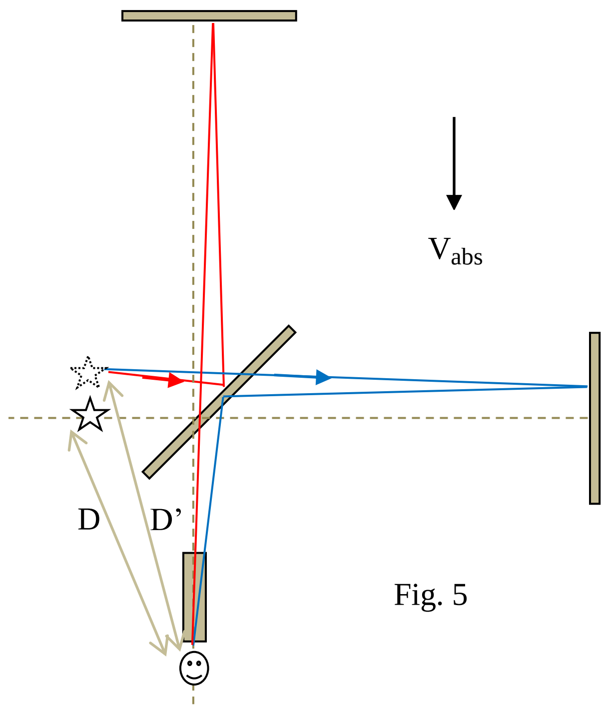


Fig. 5

The new interpretation of absolute motion of the Michelson interferometer is this. The effect of absolute motion is to create an apparent change in the position of the light source relative to the detector. This apparent change of source position (caused by absolute motion) will not create any significant fringe shift (no fringe shift or a small fringe shift) for the same reason that an actual/physical change of source position will not create any significant fringe shift. This explains the 'null' result of the Michelson-Morley experiment. This is the subtle nature of light that completely eluded physicists for centuries.

The procedure of analysis of the Michelson-Morley experiment is restated as :

1. Replace the real source by an apparent source

2. Analyze the experiment by assuming that light is emitted from the apparent source position, not from the real source position.

The real source is replaced by an apparent source in order to account for absolute velocity. Once this is done, the experiment is analyzed by assuming that light is emitted from the apparent source and by using elementary geometrical optics. Thus Apparent Source Theory reduces an absolute motion problem into a geometrical optics problem. Once we replace the real source with an apparent source, we can assume emission theory, i.e. the speed of light is constant relative to the apparent source.

We re-formulate Apparent Source Theory for the Michelson-Morley (MM)experiment as follows.

1. The effect of absolute motion of the Michelson-Morley interferometer is to create an APPARENT change in light source position relative to the detector
2. This apparent change of source position creates a (small) fringe shift AS IF it is an ACTUAL / physical change of source position.

Small fringe shifts can be produced in the Michelson-Morley experiment in two ways:

1. By setting the Michelson-Morley apparatus in absolute motion
   OR
2. By slightly changing the position of the light source (1mm for example) about its initial position.

The fringe shift for every absolute velocity of the MM apparatus is equal to the fringe shift for a *corresponding* ACTUAL change in source position. For every absolute velocity (magnitude and direction), there is a corresponding change in source position that will produce the same fringe shift.

The corresponding change in source position is determined according to the AST procedure. It is determined by the source detector distance, the magnitude and direction of absolute velocity and the orientation of the source detector line with respect to the direction of absolute velocity.

Apparent Source Theory can be seen as a seamless fusion of ether theory and emission theory.

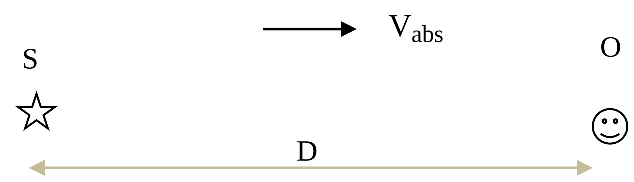
Quantitative determination of apparent source position relative to the observer

So far we have provided only a qualitative explanation of the Michelson-Morley experiment. We have stated that the effect of absolute motion of an observer is to create an apparent change in the past position of the source (an apparent change in the point of light emission) relative to the observer/detector. In this section we give a quantitative analysis of the apparent source position.

We restate Apparent Source Theory as follows:

The effect of absolute motion for co-moving light source and observer is to create an apparent change in the position (distance and direction) of the light source relative to the observer.

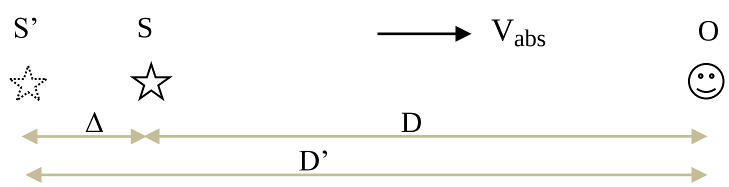
Imagine a light source S and an observer O, both at (absolute) rest, i.e. $V_{abs} = 0$.



A light pulse emitted by S will be detected after a time delay of

$$t_d = \frac{D}{c}$$

Now suppose that the light source and the observer are absolutely co-moving to the right.



The new interpretation proposed here is that the position of the source S changes apparently to S', *as seen by the observer, relative to the observer*.

During the time (t_d) that the source 'moves' from point S' to point S, the light pulse moves from point S' to point O, i.e. the time taken for the source to move from point S' to point S is equal to the time taken for the light pulse to move from point S' to point O.

$$\frac{\Delta}{V_{abs}} = \frac{D'}{c}$$

But

$$D + \Delta = D'$$

From the above two equations:

$$D' = D \frac{c}{c - V_{abs}}$$

and

$$\Delta = D \frac{V_{abs}}{c - V_{abs}}$$

The effect of absolute motion is thus to create an apparent change of position of the light source relative to the observer, in this case by amount Δ .

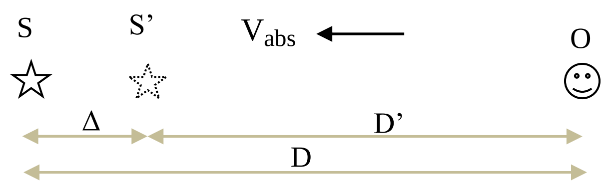
Once we have determined the apparent position of the source as seen by the co-moving observer, we can analyze the experiment by assuming that light was emitted from S' (not from S) and that the speed of light is constant relative to the apparent source.

Therefore, a light pulse emitted by the source is detected at the observer after a time delay of:

$$t_d = \frac{D'}{c} = \frac{D\dfrac{c}{c - V_{abs}}}{c} = \frac{D}{c - V_{abs}}$$

To the observer, the source S appears to be farther away than it physically is.

In the same way, for absolute velocity directed to the left:



$$\frac{\Delta}{V_{abs}} = \frac{D'}{c} \qquad and \qquad D - \Delta = D'$$

From which

$$D' = D\frac{c}{c + V_{abs}}$$

and

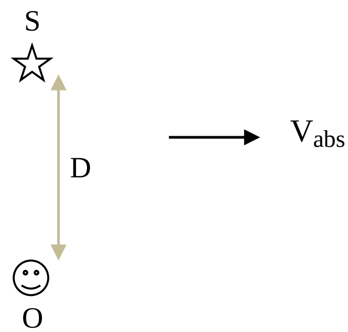
$$\Delta = D\frac{V_{abs}}{c + V_{abs}}$$

In this case, it appears to the observer that the source is nearer than it actually is by amount Δ.

Once we have determined the apparent position (S') of the source as seen by the co-moving observer, we can determine the time delay t_d. Therefore, a light pulse emitted by the source is detected at the observer after a time delay of:

$$t_d = \frac{D'}{c} = \frac{D\dfrac{c}{c + V_{abs}}}{c} = \frac{D}{c + V_{abs}}$$

Now imagine a light source S and an observer O as shown below, with the relative position of S and O orthogonal to the direction of their common absolute velocity.



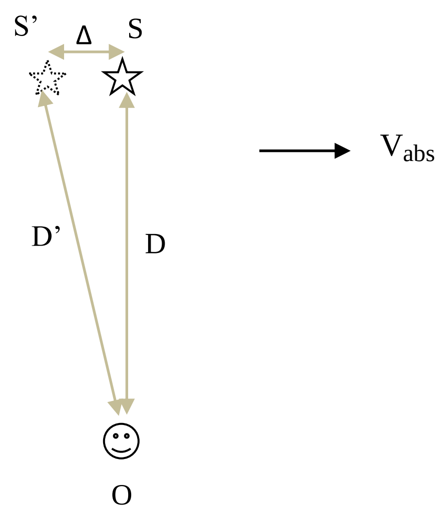
S and O are moving to the right with common absolute velocity V_{abs}.

If V_{abs} is zero, a light pulse emitted from S will be received by O after a time delay t_d

$$t_d = \frac{D}{c}$$

In this case, light arrives at the observer from the direction of the source, S.

If V_{abs} is not zero, then the source position appears to have shifted to the left as seen by the observer O.



In this case also, the effect of absolute velocity is to create an apparent change in the *position*(distance and direction) of the light source relative to the observer.

In the same way as explained previously,

$$\frac{D'}{c} = \frac{\Delta}{V_{abs}}$$

i.e. during the time interval that the light pulse goes from S' to O, the source goes from S' to S.

But,

$$D^2 + \Delta^2 = D'^2$$

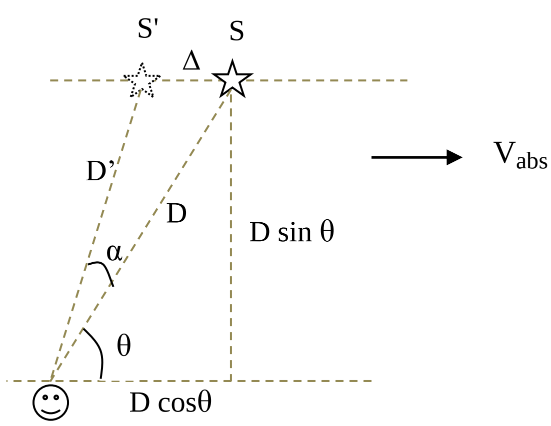
From the above two equations

$$D' = D\frac{c}{\sqrt{c^2 - {V_{abs}}^2}} \text{ and } \quad \Delta = D\frac{V_{abs}}{\sqrt{c^2 - {V_{abs}}^2}}$$

Therefore, the time delay t_d between emission and reception of the light pulse in this case will be

$$t_d = \frac{D'}{c} = \frac{D}{\sqrt{c^2 - {V_{abs}}^2}}$$

For a more general case of co-moving source and observer relative positions with respect to the direction of absolute velocity, the situation will be as follows.



We want to get the relationship between θ and Δ .

$$\frac{D'}{c} = \frac{\Delta}{V_{abs}} \qquad (1)$$

$$\Delta = D\cos\theta - \sqrt{D'^2 - D^2 \sin^2\theta} \qquad (2)$$

From (1) and (2)

$$D'^2\left(1 - \frac{{V_{abs}}^2}{c^2}\right) + \frac{2DV_{abs}}{c}\cos\theta\ D' - D^2 = 0$$

which is a quadratic equation from which D' can be determined, which in turn enables the determination of Δ and α.

Moving mirror experiments

One of the questions scientists have been investigating is whether the speed of light is affected by the velocity of the mirror. One of the early experiments is the A. Michelson moving mirror experiment. A. Michelson reported that mirror velocity did not affect the velocity of light. On the contrary, the Venus planet radar range data showed, as analyzed by Bryan G Wallace, an anomaly that showed dependence of velocity of light on mirror velocity as predicted by ballistic theory. There is no classical or modern theory that can resolve this contradiction. We will present a new theory and interpretation as follows.

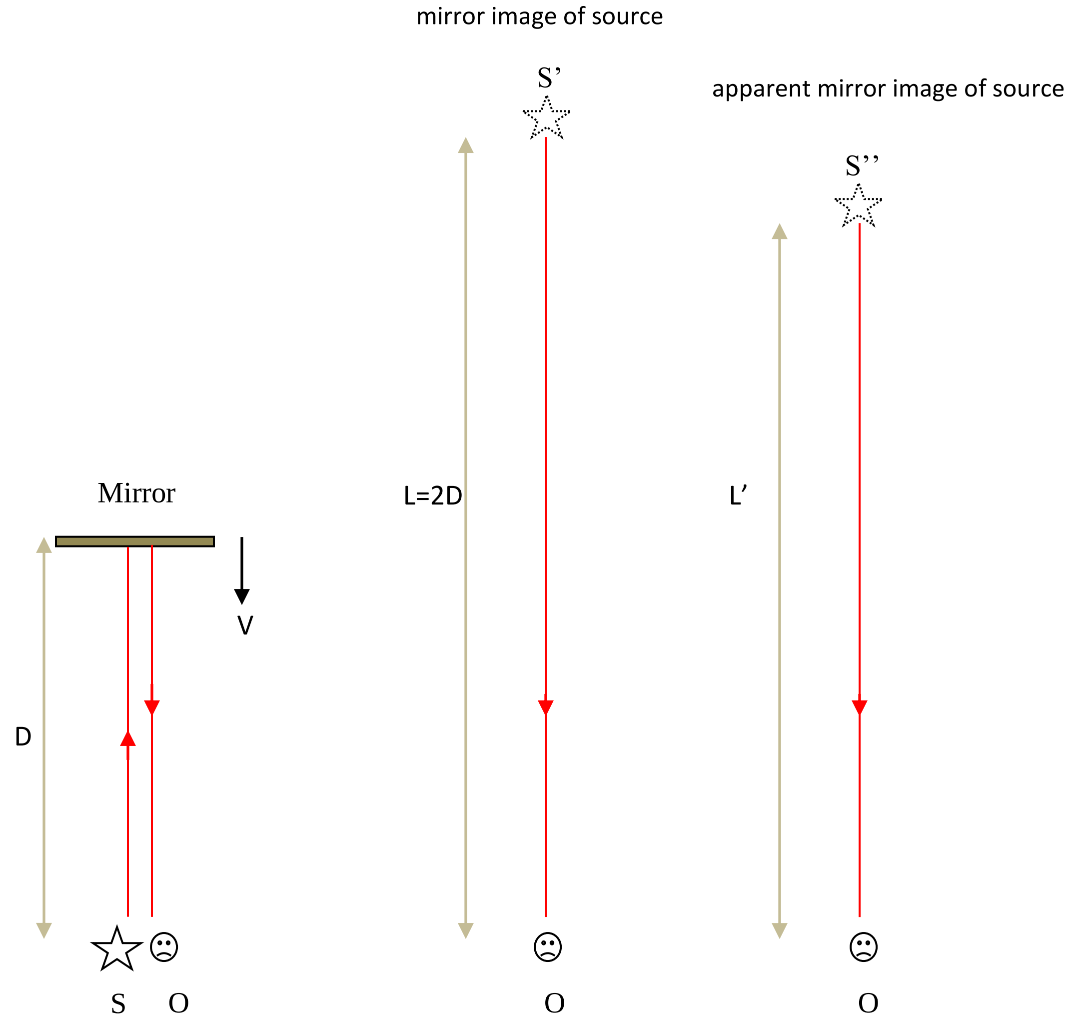


Fig 6a   Fig 6b   Fig 6c

The new interpretation is stated as follows.

Light reflected from a mirror moving towards an observer will arrive earlier than light reflected from a stationary mirror, even if the distance of the mirror from the observer at the instant of reflection is the same in both cases. This is analogous to bouncing of a ball from a wall. Light reflected from a mirror moving towards an observer arrives earlier just as ball bouncing from a wall moving towards an observer arrives earlier than if the wall is stationary. In the case of the ball, the ball arrives earlier because the wall imparts its velocity to the ball. In the case of light, however, this conventional understanding is fallacious and the bouncing ball analogy no more applies. The new interpretation in the case of light is that the light arrives earlier not because of change in the velocity of light but because of an apparent change in the position of the mirror image of the source. Suppose that the distance between the mirror and the observer at the instant of light reflection is D and that the source and observer are at the same point close to each other. If the mirror is at rest relative to the observer, the distance of the mirror image of the source from the observer will be L = 2D . If the mirror is moving towards the observer, however, the mirror image of the source will be at a distance L' < L from the observer, thereby accounting for the earlier arrival of light. In the case of mirror moving away from the observer, L' > L. The procedure of analysis, therefore, is to replace the 'actual' mirror image S' of the source (which is at distance L = 2D) with an apparent image S'' which is at distance L'. The time elapsed between emission and detection is T = L'/ c . The denominator c shows the constancy of the speed of light regardless of the motion of the mirror. The effect of motion of the mirror is only to create an apparent change in position of the mirror image of the source.

Fig 6b shows the image of the source for stationary mirror, for V = 0.

In the case of mirror moving towards the observer with velocity V, L' < L as shown in the figure above, and

$$L' = 2D \frac{c+V}{c+2V}$$

Therefore, if the distance between the source (and the observer) and the mirror at the instant of light reflection from the mirror is D, the time it takes for the light to reach the observer will be:

$$\tau = \frac{L'}{c} = \frac{2D \frac{c+V}{c+2V}}{c} = \frac{2D(c+V)}{c(c+2V)}$$

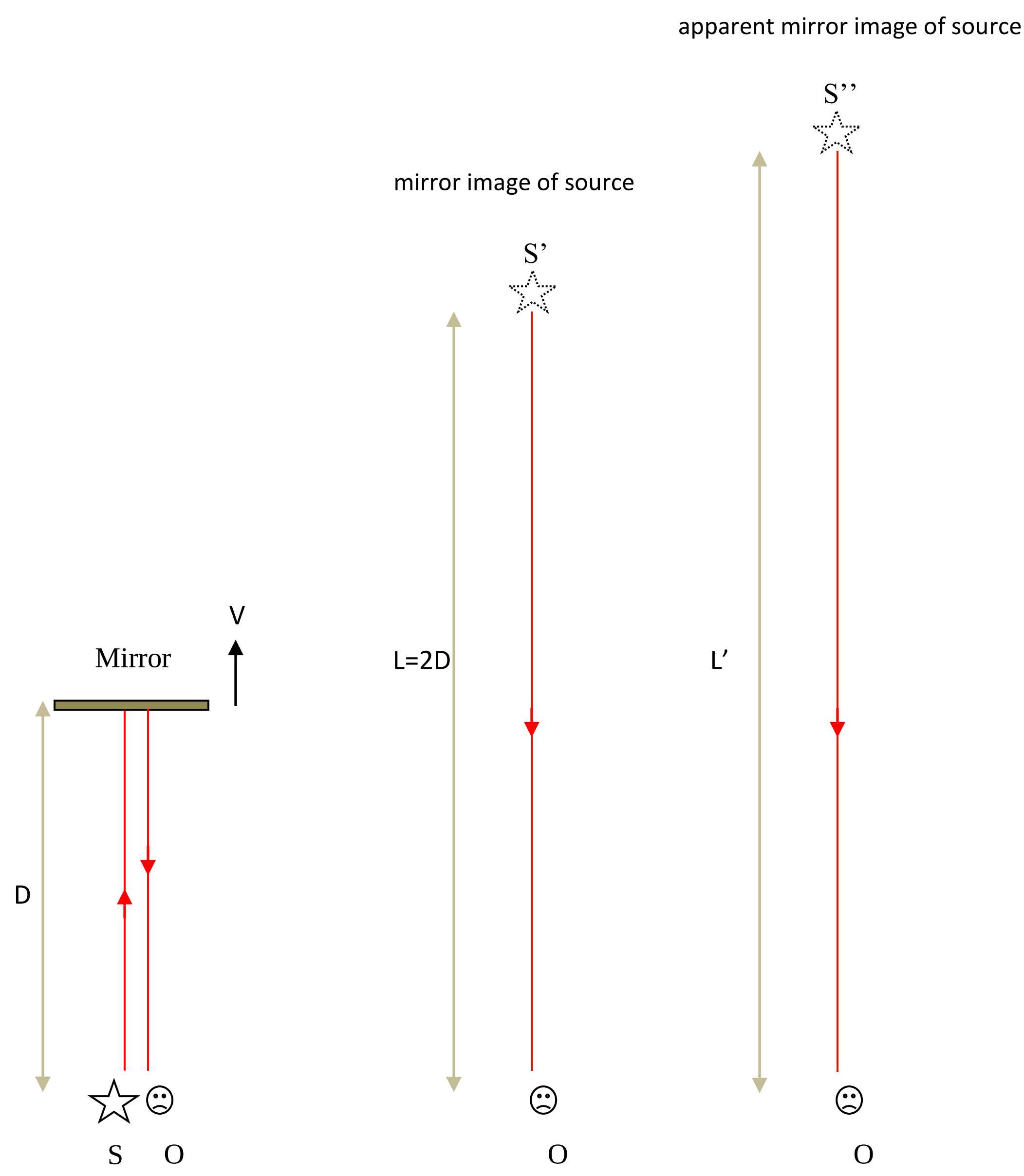


Fig 7a Fig 7b Fig 7c

Fig 7b shows the image of the source for stationary mirror, for V = 0.

In the case of mirror moving away with velocity V, L' > L and

$$L' = 2D \frac{c - V}{c(c - 2V)}$$

Therefore, if the distance between the source (and the observer) and the mirror at the instant of light reflection from the mirror is D, the time it takes for the light to reach the observer will be:

$$\tau = \frac{L'}{c} = \frac{2D\,\frac{c-V}{c-2V}}{c} = \frac{2D(c-V\,)}{c(c-2V)}$$

The A. Michelson moving mirror experiment

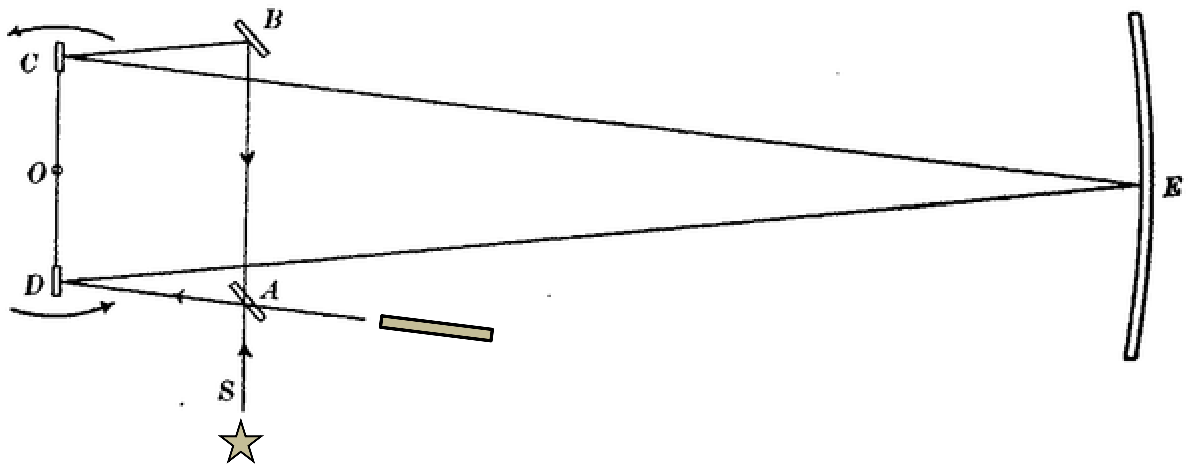


Fig. 8 The A. Michelson moving mirror experiment

A. Michelson carried out the above experiment to test if the velocity of light depended on mirror velocity. Light emitted from the source is split into two beams by the beam splitter. One light beam (beam 1) follows the path ADECBA and the other light beam (beam 2) follows the path ABCEDA. According to ballistic (emission) theory, mirror D imparts a positive velocity component to beam 1 whereas mirror C imparts a negative velocity component to beam 2. Therefore, beam 1 will travel path DEC with higher velocity than beam 2 travels path CED. Therefore, beam 1 would arrive at the detector earlier than beam 2 due to motion of the mirrors, and this would show as change in the fringe positions. However, Michelson did not observe a corresponding fringe shift and concluded that the speed of light is constant independent of mirror velocity. Bur Michelson's conclusion implies the ether which was disproved by the Michelson-Morley experiment.

We provide a new explanation based on the theory presented above regarding light reflected from moving mirrors. According to this theory, although motion of mirror D will create an apparent change in the position of the image source, this will be cancelled by motion of mirror C because mirrors D and C have opposite effects on beam 1. In the same way, effects of motion of mirrors C and D on beam 2 will cancel each other. Therefore, although the mirrors are in motion, beam 1 and beam 2 will travel the same distances and hence no fringe shift will be induced due to motion of the mirrors.

What is absolute motion ?

The Michelson-Morley experiment has disproved the ether and yet we have claimed that absolute motion exists. If the ether doesn't exist what is absolute motion relative to ?

Absolute velocity of an object is the resultant of weighed relative velocities of the object with respect to all matter in the universe.

The fact that the Silvertooth experiment measured almost the same magnitude and direction of Earth's absolute velocity (378 Km/s , towards Leo constellation) as the NASA CMBR Doppler measurement shows that absolute velocity is basically nothing but relative velocity.

Exponential Doppler Effect theory of light

One of the guiding principles I have been using is Einstein's light postulate, which I initially interpreted as constancy of the phase velocity of light. This new interpretation gave rise to a question regarding the Doppler effect of light. Since the phase velocity of light is $c = f\lambda$, I realized that conventional formulas of Doppler effect containing the terms $c \pm V$ cannot satisfy the constant phase velocity condition.

In searching for a new law governing the Doppler effect of light that fulfills the criteria of constant phase velocity, I found that the exponential function fulfills the above condition and is perhaps the only possibility.

The new Exponential law of Doppler effect of light is :

$$f' = f\, e^{\frac{-V}{c}} \quad \text{and} \quad \lambda' = \lambda\, e^{\frac{V}{c}}$$

where *e* Euler's constant and V is the source observer *relative* velocity and is positive for source and observer receding from each other.

We can see that the Exponential Doppler Effect law satisfies the condition of constant phase velocity:

$$f'\lambda' = f\, e^{\frac{V}{c}}\, \lambda\, e^{\frac{-V}{c}} = f\,\lambda = c$$

Now let us apply the new formula to explain the red shift in the Ives Stilwell experiment.

Doppler shift for approaching ion:

$$\lambda_A{}' = \lambda\, e^{\frac{-V}{c}}$$

Doppler shift for receding ion:

$$\lambda_R{}' = \lambda\, e^{\frac{V}{c}}$$

By applying

$$e^x = 1 + x + \frac{1}{2}x^2 + \frac{1}{6}x^3\ + . . . \quad (for\ -\ \infty < x < \ \infty$$

Average wavelength

$$\Lambda = \frac{1}{2}\left(\lambda_A{}' + \lambda_R{}'\right) = \frac{1}{2}\ (\lambda e^{\frac{-V}{c}}\ +\ \lambda e^{\frac{V}{c}}\ )$$

$$\Lambda = \frac{1}{2}\lambda\ (\ 1 - \frac{V}{c} + \frac{1}{2}\frac{V^2}{c^2} + \ . . . \quad +\ 1\ +\ \frac{V}{c}\ +\ \frac{1}{2}\frac{V^2}{c^2}\ + \ . . .)$$

$$\Lambda\ \cong \frac{1}{2}\lambda\left(\ 1 - \frac{V}{c} + \frac{1}{2}\frac{V^2}{c^2} + \ \ 1\ +\ \frac{V}{c}\ +\ \frac{1}{2}\frac{V^2}{c^2}\right)\ \ ,\ \ for\ \ V \ll c$$

$$\Lambda\ \cong \lambda\left(\ 1 + \frac{1}{2}\frac{V^2}{c^2}\right)$$

$$\Delta\lambda = \ \Lambda - \ \lambda\ = \ \lambda\left(\ 1 + \frac{1}{2}\frac{V^2}{c^2}\right) -\ \lambda$$

$$\Delta\lambda = \ \frac{1}{2}\frac{V^2}{c^2}\ \lambda\ = \frac{1}{2}\beta^2\ \lambda$$

This is exactly the value predicted by SRT and confirmed by the Ives Stilwell experiment.

For V <<c , it can be shown that the exponential formula reduces to the classical one.

$$f' = f\ e^{\frac{V}{c}}\ =\ f\ \left(1 + \ \frac{V}{c} + \frac{1}{2}\frac{V^2}{c^2}\ +\ . . . \right) \cong\ f\ \left(\ 1 + \ \frac{V}{c}\right) = f\ \frac{c+V}{c}\ \cong\ \frac{c}{c-V}\ \ , \qquad for\, V\ \ll c$$

Conclusion

Einstein's principle of constancy of the speed of light was correct. The constancy of the speed of light follows directly from the null results of ether drift experiments. However, the consequence of that principle which is the relativity of space and time, led to many paradoxes. Moreover, absolute motion was later proved to exist in other experiments. Therefore, Einstein's constant light speed postulate was correct but incomplete. But the relativity of space and time is wrong. In this paper we have seen a new insight that resolves these deep contradictions. Apparent Source Theory provides the insight to understand how the speed of light can be constant and absolute motion can exist at the same time. The mystery underlying the speed of light is revealed by a single insight: *the effect of absolute motion of the observer is only to create an apparent change in the point of light emission of light*. Absolute motion does not cause change of the speed of light relative to the observer. At the heart of Apparent Source Theory is the constancy of the speed of light regardless of motion of the source, motion of the observer, motion of the mirror, for uniform velocity or acceleration. The observed non-constancy of the speed of light in some experiments is only apparent and is explained as due to apparent change of source position relative to the observer.

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https://youtu.be/W0r-UHAk_us

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