Apparent Source Theory and Stellar Aberration

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Abstract

This author has already proposed a new theory, Apparent Source Theory (AST), that can explain the Michelson-Morley experiment, the Sagnac effect, the Silvertooth experiment, the Roland De Witte experiment, the Venus planet radar range data anomaly (analyzed and reported by Bryan G Wallace) and other experiments. According to AST, there will be an apparent change in position of a light source as seen by the observer, for absolutely co-moving source and observer. The 'null' result of the Michelson-Morley experiment (MMX) is explained as follows. The effect of absolute motion is just to create an *apparent* change in position of the light source relative to the detector. There will be no (significant) fringe shift in the MMX for the same reason that there will be no (significant) fringe shift if the source position was actually, physically shifted slightly. The fringe shift in Sagnac effect is explained as follows. The source will be apparently shifted away relative to the detector when looking in the backward direction and shifted towards the detector when looking in the forward direction, hence creating a path difference. Einstein's thought experiment ('chasing a beam of light') is re-interpreted and used as one of the foundational arguments in this paper. The new interpretation is that it is the *phase* velocity of light that is always constant irrespective of source, observer and mirror velocity. The *group* velocity behaves in a more conventional way: it is independent of source (absolute) velocity but depends on observer and mirror velocity. For an observer moving near the speed of light away from a light source, the phases will still move past the observer at the speed of light while the group will be at rest relative to the observer. A contradiction between Apparent Source Theory and the phenomenon of stellar aberration has been found. The contradiction if found to be due to a conflict between conventional stellar aberration theory and the unconventional nature of Apparent Source Theory and hence is only an apparent contradiction.

Introduction

According to the principle of relativity, no experiment (optical, electromagnetic or mechanical) exists that can detect absolute motion. This presumption has already been conclusively disproved experimentally, such as by the Silvertooth experiment and the coincidence of its result with the COBE CMBR frequency anisotropy experiment. The failure of conventional first and second order experiments to detect absolute motion was not because absolute motion doesn't exist, but because the experimental setups or their understanding were flawed .

This author has already developed a new theoretical frame work[1], of which Apparent Source Theory (AST) is one component, that can explain the outcomes of many experiments that have succeeded and failed to detect absolute motion.

A contradiction of Apparent Source Theory with the phenomenon of stellar aberration was recently discovered, leading to reconsideration of the foundations of the theory.

It will be shown that Apparent Source Theory has firm logical and experimental foundations. The contradiction will also be shown to be only an apparent one.

Einstein's thought experiment, ' chasing a beam of light '

Einstein's thought experiment (' chasing a beam of light ') was a beautiful and compelling argument. It follows directly from the non-existence of the hypothetical light carrying medium (the ether). However, Einstein took the wrong path while trying to understand and 'explain' the constancy of the speed of light, resorting to illogical ideas of relativity of time and space. This thought experiment is re-interpreted in this paper as the constancy of *phase* velocity [1]. The *group* velocity of light behaves in a more conventional way: it is independent of source absolute velocity but varies with observer and mirror velocity. Einstein never made this distinction and, in fact, it was the failure to make this distinction that resulted in the creation, development and acceptance of Einstein's theories of relativity.

For an observer moving away near the speed of light from a light source, the phases will still go past the observer at the speed of light, but the group will be at rest relative to the observer or ‘frozen’.

Imagine a coherent light source and an observer initially at rest, with distance D between them.

The observer notes the phase of the light. Next imagine that the observer starts moving away from the source instantaneously with velocity V = 0.1 c . The constancy of the phase velocity implies that, unconventionally, the phase of the detected light will not change due to motion of the observer. The phase detected by the observer depends only on the source-observer distance at the instant of light emission. Motion of the observer after emission of the light will not affect the phase and the phase velocity of the light.

The constancy of the *phase* velocity of light was crucial in the pathway to the discovery of the new theory, Apparent Source Theory[1], already proposed by this author and will be used as the foundational arguments for the correctness of Apparent Source Theory .

Exponential law of Doppler effect of light

From the theory of constancy of the phase velocity of light proposed above follows an immediate question: what is the law governing the Doppler effect of light. A new theory, Exponential Doppler Effect of Light, has already been proposed by this author [2].

The new theory is formulated as follows.

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

where *e* is Euler's constant and *V* is positive for source and observer approaching each other.

This formula fulfills the constant phase velocity of light proposed above.

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

It has been shown in paper [2] that this theory can explain the Ives-Stilwell experiment.

The Michelson-Morley experiment and the Sagnac effect

The Michelson-Morley experiment might be explained by the constant phase velocity proposed above. Since the phase velocity of light is always constant, no fringe shift would be observed in the Michelson-Morley experiment.

The Michelson-Morley experiment was carried out using sunlight and star light also. The constancy of phase velocity can explain the null results of these experiments also.

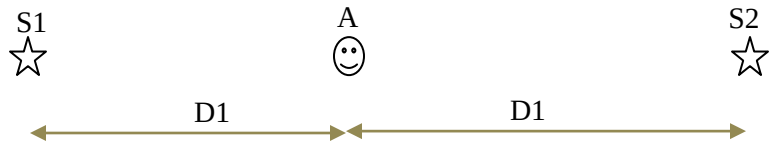
However, the 'constant phase velocity' theory faces an insurmountable problem with the Sagnac effect. Since the phase velocity of light is always constant relative to the observer, there would be no fringe shift when the Sagnac apparatus is rotating. In fact, the Sagnac effect in combination with the postulate of constancy of the phase velocity of light played a crucial role in the discovery and formulation of Apparent Source Theory by this author.

Constant phase velocity and constant/variable group velocity of light

The phase velocity of light is always constant; the group velocity of light varies with observer and mirror velocity, but is independent of source velocity.

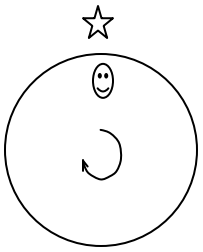
This theory can explain the null result of modified Michelson-Morley experiments using star light and Sun light. The A. Michelson moving mirror experiment, together with the Q Majorana moving source and moving mirror experiments, in combination with the argument of nonexistence of the ether, confirms the constancy of the phase velocity of light. The group velocity of light has been experimentally shown to vary (c ± V) with observer velocity[6]. This theory can explain the Michelson-Morley experiment, but fails to explain the Sagnac effect. Note that it is the phase velocity, not the group velocity that is relevant in all experiments measuring changes in phase differences, by observing fringe shifts or other means. The A. Michelson moving mirror experiment is a proof that the group velocity of light, which varies with mirror velocity and with observer velocity, is irrelevant in such experiments. This theory can be used to design and explain an experiment that can detect absolute motion by using two light sources, by using time of flight method, in which the group velocity is relevant. The group velocity of light is relevant only in time of flight experiments.

This theory particularly fails in the Silvertooth and the Roland De Witte experiments.



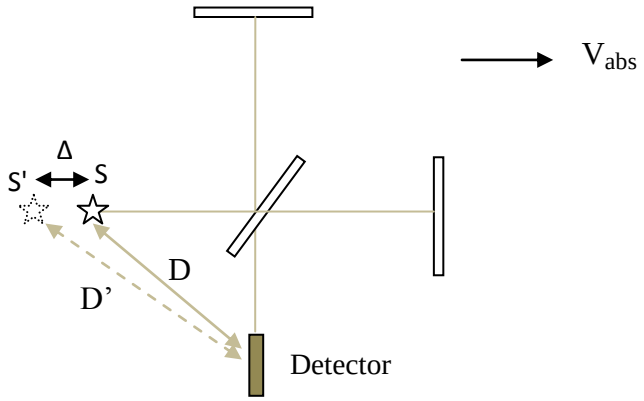
Apparent Source Theory (AST)

Consider a hypothetical Sagnac interferometer, with light propagating in a circular path by continuous reflection from a circular mirror.



If one sticks to the (compelling) postulate of the constancy of the phase velocity of light, the only way to explain the fringe shift in the Sagnac effect is to assume an apparent change in position of the light source as seen by the detector. The light source apparently shifts towards the observer/detector when 'looking' in the forward direction, and away from the detector when looking in the backward direction. The detector is at rest relative to the two apparent sources (when looking forward and backward) , the apparent path lengths of the forward and backward light beams will differ and hence a fringe shift will occur. This is the new theory, Apparent Source Theory (AST) , already proposed in [1] by this author.

This theory (AST) can easily explain the Michelson-Morley experiment null result.



According to Apparent Source Theory, there will be an apparent change in position of the light source as seen by the detector. The apparent change in source position is determined by the source-detector direct distance D, the magnitude of the absolute velocity V_{abs} and the orientation of the experimental apparatus (more precisely, the orientation of the source observer line) with respect to the Earth's absolute velocity vector.

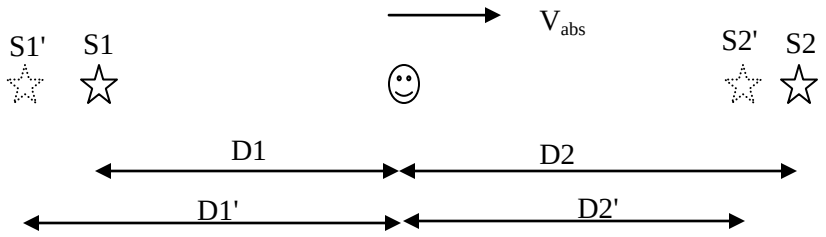
As shown in the above figure, the *apparent* change in source position will not result in any (significant) fringe shift for the same reason that no (significant) fringe shift will occur if the source position was *actually*, *physically* shifted slightly because both the longitudinal and transverse light beams would be affected (delayed or advanced) identically.

Additional experimental evidences of Apparent Source Theory

A contradiction of AST with the phenomenon of stellar aberration (to be presented later on) has brought a new challenge to AST. This led to the reconsideration of the foundations of AST. The purpose of this paper is to present compelling experimental and logical evidences of AST, as an argument that the contradiction between AST and stellar aberration is only an apparent one. Here, we will see additional experimental evidences of AST.

The Roland De Witte experiment

The Roland De Witte experiment detected absolute motion by comparison of the phases of two signals from two RF signal sources.



The constancy of the phase velocity of light predicts a null result for the Roland De Witte experiment. The only way to explain the non-null result of this experiment is to assume an apparent change in the position of the light source, as seen by the observer/detector (as seen from the point of observation), for absolutely co-moving source and observer/detector, which is Apparent Source Theory.

The Venus planet radar range data anomaly (Bryan G Wallace)

The Venus planet radar range experiment is an evidence for emission theory of light. This experiment disproves ether theory and the Special Theory of Relativity. AST, as a fusion of ether

theory and emission theory, is the only theory that can explain the Venus planet range data anomaly and also experiments that detect absolute motion.

Solar system observations

Mercury perihelion advance, stability of planetary orbits, direction of Sun's gravity on Earth

Paul Gerber had shown that Mercury perihelion advance can be explained by assuming finite speed (light speed) of gravity. In [1] it has been shown that gravity is just a net electrostatic force: a slight difference between attractive forces between opposite charges and the repulsive force between similar charges. From the experimental observations argued and reported by Tom Van Flandern [3], this author concluded [1] that the speed of gravity must have dual nature: finite (light speed) and infinite.

The direction of Sun's gravitational field on Earth is the same as the direction of arrival of light from the Sun, except for a small 20 arc seconds difference caused by the phenomenon of light aberration, which is due to the relative motion (30 Km/s) of the Earth and the Sun.

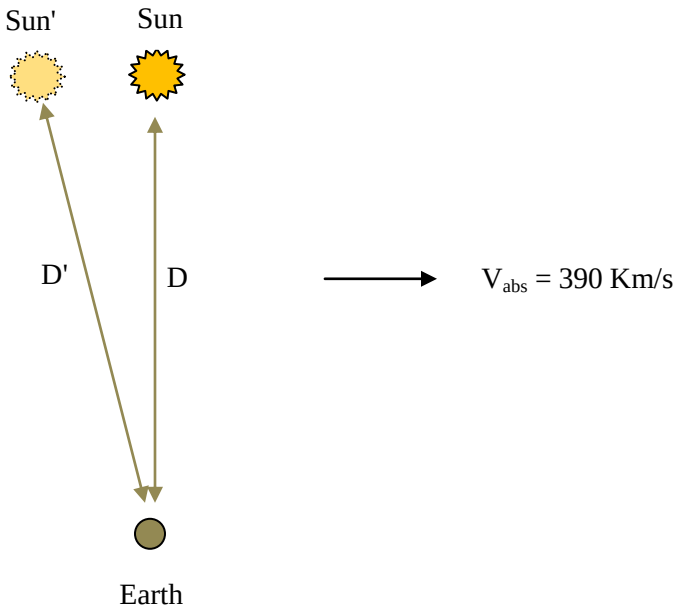
We know that the speed of static fields (electrostatic field, magneto-static field and gravitational field) is infinite. A crucial experiment [4] has been performed that showed that the electric field of a moving electron is rigidly carried by the electron. However, this experiment reveals only one aspect (infinite speed aspect) of the dual nature of the speed of electrostatic fields.

The Silvertooth experiment and the COBE satellite CMBR experiments have revealed that the solar system has an absolute velocity of about 390 Km/s towards constellation Leo.

The question is: if the solar system has such a large absolute velocity of 390 Km/s , how can the direction of arrival of Sun light be almost the same as the direction of Sun's gravity on Earth ? If we assume infinite speed of gravity, this would also imply infinite speed of light, which is wrong. Another possibility is for the speed of gravity to be equal to the speed of light. This is also conceptually wrong because it is not possible to conceive what is meant by finite speed for static fields. Moreover, the speed of electrostatic fields has been proved experimentally to be infinite[4]. Assuming that gravity is fundamentally an electrostatic field, the literal idea of finite speed of gravity is also disproved. What is the solution to this puzzle ?

The only solution to this problem is to assume that the speed of static fields has *dual nature*: *finite (light speed) and infinite.*

Infinite speed of gravity, as proposed by Newton, cannot explain Mercury perihelion advance. The phenomenon of Mercury perihelion advance was explained by Paul Gerber by assuming finite speed (light speed) of gravity. On the other hand, experiments[4] have shown that the speed of static fields is infinite. The only way out of this paradox is to assume dual nature of the speed of static fields: finite (light speed) and infinite.



According to Apparent Source Theory, there will be an apparent change in position of the Sun as seen by the Earth. Therefore, light and gravity come from the direction of the apparent Sun (Sun') and not from the direction of the real Sun (Sun). This is an observational evidence of finite speed (light speed) of gravity. How does the infinite speed of gravity manifest in this system? Imagine that the absolute velocity of the Solar System increased instantaneously from 390 Km/s to 1000 Km/s. The infinite speed of gravity manifests itself by an *instantaneous* change in apparent position of the Sun. Therefore, while the coincidence of the direction of the apparent position of the Sun and the direction of the Sun's gravity on Earth shows finite speed (*c*) of gravity, instantaneous change in the apparent position of the Sun (as observed from Earth) due to instantaneous change in absolute velocity of the Solar system would show infinite speed of gravity.

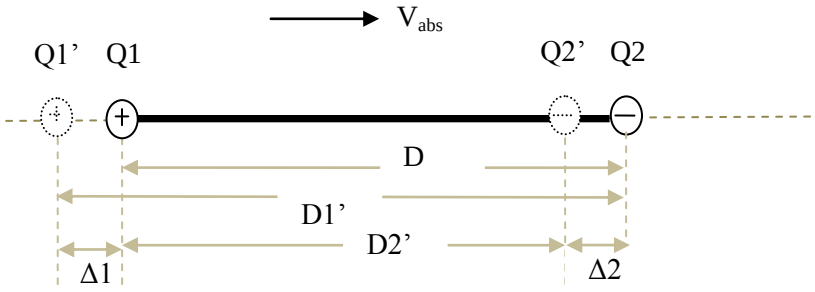
Tom Van Flandern [3] argued that the speed of gravity should be infinite for the observed orbital stability of planetary systems. However, as argued above this literal assumption of infinite speed of gravity fails to explain the phenomenon of Mercury perihelion advance and it would also wrongly imply infinite speed of light because of the coincidence (except for the 20 arc seconds difference due to light aberration caused by Earth-Sun relative velocity of 30 Km/s) of the direction of arrival of Sun light and the direction of Sun's gravity on the Earth. This may be correct only if the Solar system is at absolute rest; we know that the Solar system has an absolute velocity of 390 Km/s, towards constellation Leo. In[1] it has been shown that Apparent Source Theory can explain the stability of planetary orbits, without the literal assumption of infinite speed of gravity.

Therefore, the phenomena of Mercury perihelion advance, the coincidence of direction of Sun light and the direction of Sun's gravity on the Earth and the stability of planetary orbits are astronomical evidences for Apparent Source Theory.

Biefeld-Brown effect

The Biefeld-Brown effect is a phenomenon that is completely mysterious to figure out using conventional physics. According to Coulomb's law, for two co-moving charged balls fixed to the ends of a rigid rod, the forces of attraction or repulsion of one charge on the other are exactly equal and hence no net force will be exerted on the rod. The Biefeld-Brown effect disproves this assumption. It has been observed in many experiments that a net force exists.

Apparent Source Theory predicts this phenomenon. Imagine two charges Q1 and Q2 each fixed to the two ends of a rigid rod. Assume that the charge system has absolute velocity to the right.



D is the actual, physical distance between real charges Q1 and Q2. D1' is the apparent distance of Q1 as seen by Q2. We can also say that D1' is the distance of apparent charge Q1' from real charge Q2. D2' is the apparent distance of Q2 as seen by Q1.We can also say that D2' is the distance of apparent charge Q2' from real charge Q1.

Now the electrostatic force exerted by Q1 on Q2 will be:

$$F_{12} = \frac{1}{4\pi\varepsilon_0}\frac{Q1\,Q2}{(D1')^2}$$

The electrostatic force exerted by Q2 on Q1 will be:

$$F_{21} = \frac{1}{4\pi\varepsilon_0}\frac{Q1\,Q2}{(D2')^2}$$

But

$$D1' = D\,\frac{c}{c - V_{abs}} \text{ and } \quad D2' = D\,\frac{c}{c + V_{abs}}$$

The above equations for D1' and D2' result from new interpretations of 'speed' of electrostatic fields proposed in my paper[1].

The net force on the rod will be:

$$\Delta F = F_{21} - F_{12} = \frac{1}{4\pi\varepsilon_0}\frac{Q1\,Q2}{(D2')^2} - \frac{1}{4\pi\varepsilon_0}\frac{Q1\,Q2}{(D1')^2} = \frac{1}{4\pi\varepsilon_0} Q1\,Q2\,\left(\frac{1}{(D2')^2} - \frac{1}{(D1')^2}\right)$$

$$\Delta F = \frac{1}{4\pi\varepsilon_0}\frac{Q1\,Q2}{D^2}\left(\frac{4\,V_{abs}}{c}\right)$$

There is a net force on the system ! The force is directed in the direction of the absolute velocity.

This has a profound implication: free energy !

Conclusions regarding Apparent Source Theory

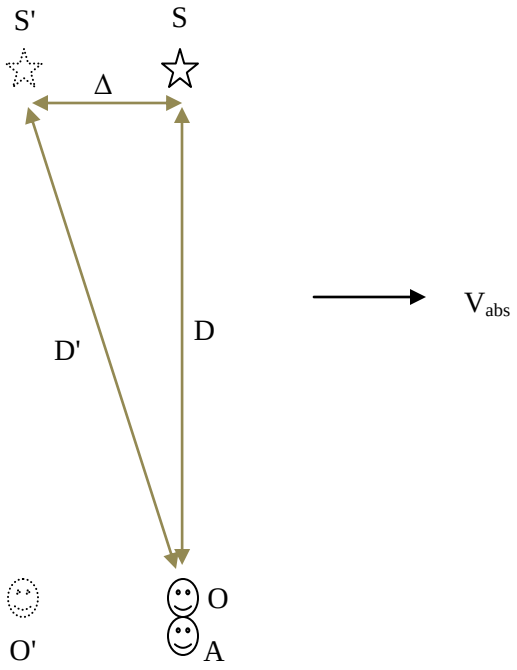
Considering the logical and experimental foundations of AST presented so far, it is reasonable to assume that Apparent Source Theory is a correct theory of light. With so many evidences supporting AST, the existence of some contradictions with AST is most likely to be an apparent one, stemming from the conflict between our simplistic, conventional thinking and the subtle nature of the speed of light. This author found that AST is in (apparent) contradiction with the phenomenon of stellar aberration.

Apparent Contradiction between Apparent Source Theory and the phenomenon of stellar aberration

A contradiction between Apparent Source Theory and the phenomenon of stellar aberration, which has been overlooked for years, has been recently discovered by this author. Since AST has a firm logical and experimental foundation, this contradiction is thought to be just an apparent one and an explanation will be provided.

<u>Contradiction of AST with stellar aberration</u>

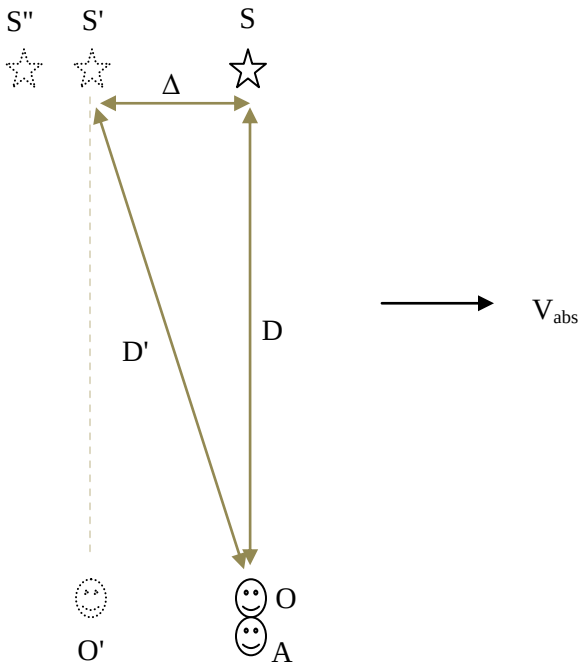
Imagine absolutely co-moving light source S and observer O. Assume also another observer A who is at absolute rest.



Assume that the source emits light at the instant when it is at position S' and the co-moving observer is at position O'. The observer A is always at absolute rest at position A. Assume that moving observer O detects the light just at the instant that he/she is passing through the location of stationary observer A. According to Apparent Source Theory (AST), the co-moving observer O has to point his telescope towards point S' to see the light, due to apparent change in position of the light source for absolutely co-moving source and observer[1]. Since moving observer O and stationary observer A are at the same point at the instant of light detection, observer A will also detect the light at that instant. However, we know that observer A should also point his telescope in the direction of S', the point in space where light was emitted. We see that both the stationary observer and the moving observer would point their telescopes in the same direction to see the light. This is in contradiction with the phenomenon of stellar aberration and is a challenge to Apparent Source Theory.

As another related contradiction, suppose that at the instant of light detection, the co-moving observer O instantaneously starts moving to the left with velocity V_{abs} relative to the source. This would make observer O to be stationary at the point where observer A is located because the forward absolute velocity V_{abs} of observer O to the right will be cancelled by the backward velocity V_{abs} of O relative to the source. Since observer A and observer O are now both stationary at almost the same point in space, both should observe the light in the same way. We know that stationary observer A has to point his telescope towards point S', the point where the source was at the instant of emission. But, according to the theory of light aberration, if observer

O had to point his/her telescope towards S' when co-moving with the source, he should point to point S" when moving relative to S, as shown below. Although observers A and O are at the same point in space and also both at absolute rest (therefore, at rest relative to each other), observer A has to point his telescope in the direction of S' , while observer O has to point his telescope towards direction S", which is a contradiction.

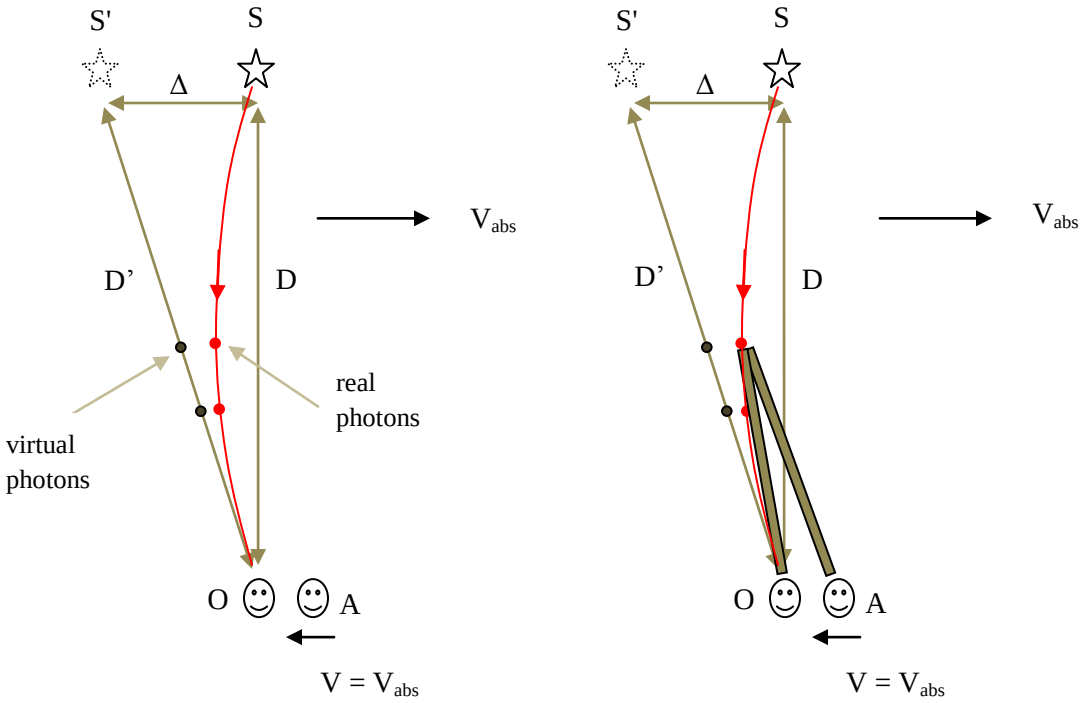


Since both observers are at the same point in space and are at rest relative to each other, the light should come from the same direction for both observers. Which direction is correct ?

Astronomical observations of binary stars shows that stellar aberration depends only on the absolute velocity of the observer and is independent of absolute velocity of the light source[5]. This disproves the theory that observer O will see light coming from direction of S".

Unconventional Apparent Source Theory and conventional understanding of stellar aberration

The contradiction between Apparent Source Theory and stellar aberration is an apparent one, arising from a conflict between conventional understanding of stellar aberration and the subtlety of Apparent Source Theory.



The co-moving observer O has to point his telescope in the direction of S'. The black dots are the virtual photons coming to observer O. However, the real photons (red dots) come to observer O along the curved path. The apparent paradox arose because conventional understanding of stellar aberration was applied to the virtual photons, for the moving observer A. There would be a paradox only if the light coming to the co-moving observer actually came from the direction of S', along the line OS'.

Observer A , who is moving to the left with velocity V_{abs} relative to observer O, should point his telescope not to the virtual photons, but to the real photons, as shown above. Note that, theoretically, observer A should continuously rotate his/her telescope clockwise, from the instant when the photon enters the telescope, until it is detected at the bottom of the telescope, which will happen when observer A is at the same point as co-moving observer O. This is because the photons move along curved path.

Note again that, theoretically, co-moving observer O also needs to rotate his telescope from the instant that the photon enters the telescope until it is detected at the bottom of the telescope.

Practically, the telescopes are much shorter than shown in the figure and the tangent of the light ray at the point of observer O passes through S' and the curvature of the light ray in the vicinity of observer O will be negligible and observer O needs only to point his telescope towards S'.

As observer A approaches observer O position, the directions of their telescopes become more and more aligned, until both will finally point towards S', at the instant of light detection, when observer A just passes point O (the location of observer O).

That observer A should continuously appropriately rotate his telescope clockwise while moving is theoretical. Practically, the telescope of observer A also is short and will be pointed parallel to line OS' , in the same direction as observer O, in order to see the light at point O.

With this understanding, the contradiction between Apparent Source Theory and the theory of stellar aberration has been shown to be only apparent.

Conclusion

The contradiction of Apparent Source Theory has been one of the most enigmatic problems in the development and understanding of the theory. It has been shown that this contradiction is only apparent, cause by mixing conventional stellar aberration theory with the unconventional Apparent Source Theory.

Thanks to God and the Mother of God, Our Lady Saint Virgin Mary

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