Light aberration without source observer relative motion - Solving the contradiction between the Michelson-Morley and the Sagnac experiments - Making Special Relativity unnecessary

A new Michelson-Morley experiment using two independent coherent light sources.

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09 July 2014 G.C (03/11/2006 Ethiopian Calender)

Abstract

Conventionally, the phenomenon of light (stellar) aberration is understood as a phenomenon of source observer relative motion. In this paper, it is proposed that a phenomenon of aberration exists even if the source and the observer are at rest relative to each other, but co-moving absolutely in space. The contradiction between the Michelson-Morley experiment and the Sagnac effect is resolved by this theory and this may lead to understanding of many of the other experiments and observations on the speed of light. It discloses the mystery of inability to detect any dependence of the velocity of light on the velocity of its source. Special Relativity theory is rendered unnecessary. A new interpretation of absolute motion and the non-existence of the ether is proposed. A new kind of Michelson-Morley experiment capable of detecting absolute motion is proposed.

There are three main theories on the speed of light: the emission theory, the ether (or absolute space) theory and Einstein's light postulate (Special Relativity). The emission and ether theories are logical and natural but each fails decisively on a number of experiments. Special Relativity agrees with experiments apparently better than the two, but is counterintuitive, unnatural.

The emission theory is a natural explanation for the Michelson-Morley, Kennedy-Thorndike and the Trouton-Noble experiments. The ether theory fails on these experiments.

The ether theory is a natural explanation for the Sagnac, Michelson-Gale, moving source and moving mirror (Albert Michelson, Q.Majorana, …) experiments, the Miller experiment, the Silvertooth and the Marinov experiments, de Sitter's binary star argument. The emission theory fails to explain these experiments.

The phenomenon of stellar aberration is not necessarily in disagreement with the emission and the ether theories.

We see that many of the crucial experiments and observations on the speed of light can be explained logically, intuitively, naturally, by either the emission or the ether theory.

However, there are a number of other ‘exotic’ experiments which have defied any intuitive approach for their explanation. Some of these are the Ives-Stilwell experiment, the Hafele –Keating experiment, other time dilation experiments, relativistic mass increase of the electron, bending of star light near the sun, etc.

Special and General Relativity theories are the theories that have been considered as governing the universe. However, Special Relativity (SRT) utterly fails to explain the Sagnac effect. However, the Sagnac effect has been a source of controversies as it is also claimed that it does not disagree with SRT. The most decisive blow to Relativity theories is the Silvertooth experiment.

A mind blowing evidence of absolute motion of the earth was disclosed by Silvertooth in his experiment of 1986 [1]. Silvertooth's experiment revealed an absolute velocity of 378 Km/s at a time when an upper bound of about 2.5 cm/s was set on a possible anisotropy of light speed, with a series of conventional and modern Michelson-Morley type experiments ! The absolute velocity detected in Silvertooth's experiment varied from about zero to a maximum of 378 Km/s , correlated with sidereal time and consistently pointing to the constellation Leo. Silvertooth's experiment would be ignored by the scientific community as usual. The astonishment came later on when precise measurement of CMBR spectrum anisotropy by NASA COBE satellite showed a velocity of 390 Km/s of the solar system relative to the CMBR, in the same direction towards constellation Leo, in striking agreement with Silvertooth's experiment. However, the analysis and explanation given by Silvertooth himself was not clear and was based on the ether theory.

Other experiments pointing to absolute motion were also performed by different physicists, such as the earlier Marinov experiment and the later experiment carried out by Ronald DeWitte.

There are also a number of anomalies that have remained unexplained by SRT. Two of the outstanding ones are the Pioneer Anomaly and the radar range data anomaly of Planet Venus (Bryan G. Wallace) .

The utter failure of SRT on these experiments and observations and its counterintuitive nature were the motivations behind the search for an alternative theory by this author.

The whole Relativity castle is built on the ‘length contraction time dilation’ hypothesis which was originally meant to explain the MMX null result. Surprisingly, another crucial experiment –the Sagnac effect- has no part in the synthesis of Relativity theory. Many authors have noted that ‘relativists’ make no mention of the Sagnac effect, as if it is not a physical phenomenon of light. The Sagnac effect has been seen as an ‘ugly’ fact that counters the ‘beauty’ of Relativity. The mainstream relativistic physics is built on the continued interpretation of the ‘length contraction time dilation’ hypothesis. The right thing would have been to reconcile these two crucial and paradoxically contradicting experiments in the first place than to continue interpretation of a counterintuitive speculation.

I strongly feel that the mystery of the speed of light is contained in the contradiction between the Michelson-Morley and the Sagnac experiments. Resolving this contradiction will solve the core problem of the speed of light, enabling us to explain the other experiments and phenomenon, including those ‘exotic’ experiments, such as ‘time dilation’ and transverse Doppler effect or paving the way for their understanding or even making them non-existent. In this case, the Special Relativity theory would be rendered unnecessary. This has been shown to be the case in a paper already posted by this author [1].

This paper is meant to be a concise form of another paper [1] posted on Vixra site by this author:

' Apparent shift of position of light source due to absolute motion; Absolute space as defined by massive cosmic objects; Locally constant phase velocity and locally variable group velocity of light; Relativity of electromagnetic fields and waves. '

This paper aims to resolve the contradiction between the Michelson-Morley and the Sagnac experiments.

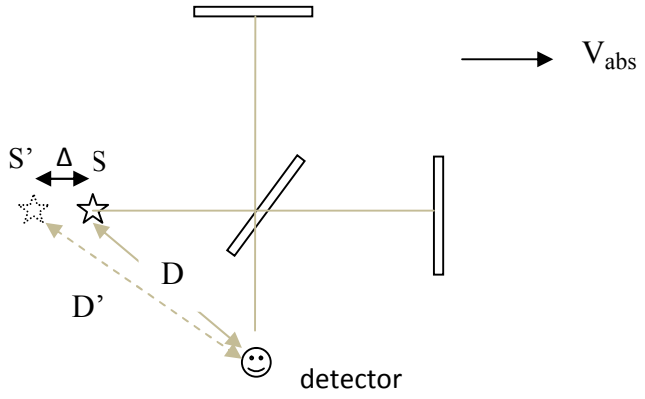
Resolving the contradiction between the Michelson-Morley and the Sagnac experiments – Aberration of light for absolutely co-moving source and observer

The solution to the mystery of the speed of light is found in closer examination of the phenomenon of light aberration. Light aberration is known to be the apparent change of position of light source as seen by the observer.

This same idea is found to be the hint to the subtle solution to the contradiction between the MMX and the Sagnac effect.

Conventionally, the phenomenon of aberration is understood as a phenomenon of source observer relative motion. In this paper, it is proposed that a phenomenon of light aberration exists even if the source and the observer are at rest relative to each other, but co-moving absolutely in space.

Consider the Michelson-Morley apparatus.



If we make an intuitive speculation that the effect of absolute motion is just to create an apparent change in the position of the light source as seen by the observer, then we immediately conclude that no fringe shift is to be expected when the apparatus is in absolute motion. An easy way to understand this is to think of *physically* shifting the position of the source from S to S' . Will this result in a fringe shift ? Obviously no. The same holds for an *apparent* shift of position of the source due to absolute motion.

There will be no slant light path as assumed in the analysis with ether and SRT theories. The effect of absolute motion is not to create a slant path of light, but only to create an apparent shift of position of the light source, as seen by the observer.

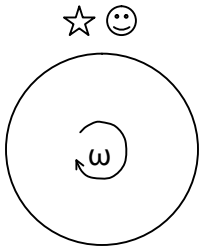
The fringe shift is determined by the fact that the time it takes the source to move from position S' to position S is equal to the time it takes for the light to move from S' to the observer.

This hypothesis is distinctly different from both the emission and the ether theories. It is a fusion of the emission and the ether theories.

Can this hypothesis explain the Sagnac effect?

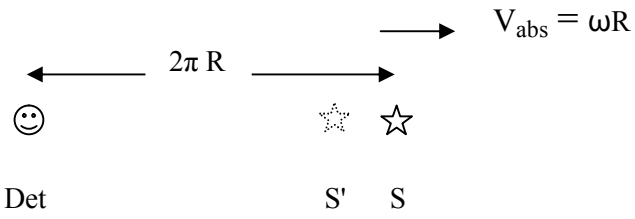
The Sagnac effect

Consider a Sagnac device in (absolute) rotation.

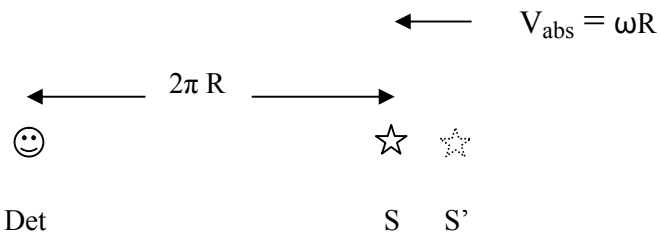


If we 'unwind' the device, it will look like as follows.

Observer looking in the forward direction (in the direction of rotation):



Observer looking in the backward direction:



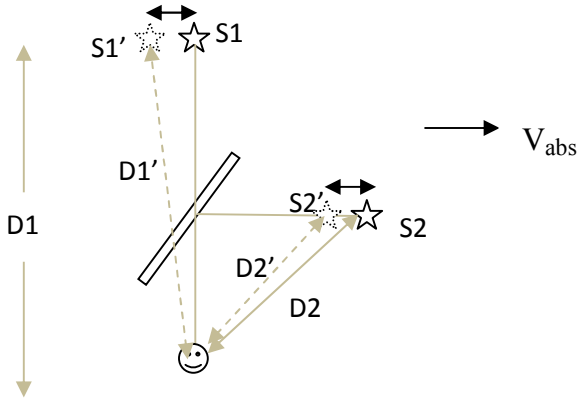
If the device is at absolute rest , i.e. not in rotation (and not in absolute translational motion), the observer sees the light source to be at its real position S.

When the device is in rotation, however, the position of the source changes apparently, as seen by the observer. When looking in the forward direction, the light source appears to be nearer than it actually is . When looking in the backward direction, the source appears to be farther than it actually is. The real distance between source and observer in this case is 2π R (after 'unwinding' the device). The fringe shift is determined by the fact that the time it takes the source to move from position S' to position S is equal to the time it takes for the light to move from S' to the observer.

This creates a difference in path length between the forward and backward beams, and hence a fringe shift.

New proposed Michelson-Morley experiment

To detect absolute motion with an MMX type experiment, we need two coherent light sources, as shown below. The single light source is omitted and the two reflecting mirrors are replaced by two coherent light sources.



With zero absolute velocity, the two light beams arriving at the detector are aligned and have equal path lengths. However, with non zero absolute velocity, the two beams will be misaligned and there will be a difference in the path lengths of the two beams , hence a fringe shift will be expected.

The comprehensive explanation of the new theory is found in [1].

Thanks to God and His Mother, Our Lady Saint Virgin Mary.

References

1. *' Apparent shift of position of light source due to absolute motion; Absolute space as defined by massive cosmic objects; Locally constant phase velocity and locally variable group velocity of light; Relativity of electromagnetic fields and waves. ',* Vixra, Henok Tadesse