

# Explanation of the "Null" Result of the Michelson-Morley Experiment - Apparent Source Theory

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## Abstract

A new explanation of the Michelson-Morley experiment is presented in this paper. This paper reveals the subtle nature of light that has eluded physicists for centuries. It is revealed that the puzzle of the speed of light is solved only by a new theory that is a fusion of the classical theories: ether theory and emission theory of light, the two theories that have been wrongly seen as rivals for centuries.

## Introduction

For centuries, before the advent of Einstein's theory of relativity, the behavior of the speed of light had confused scientists. Two *rival* classical theories of light existed: the emission theory and ether theory, which always competed with each other. In some experiments and observations, light seemed to behave according to the ether theory and in other cases it behaved according to emission theory. Eventually, this puzzlement reached its climax when the Michelson-Morley experiment, which was designed to detect the ether, gave a 'null' result.

This puzzle was so great that physicists were forced to give up logical, intuitive thinking and resorted to some unnatural hypotheses. Initially, Lorentz's length contraction hypothesis seemed to explain the null result. These and previous developments eventually led to formulation of the final form of Lorentz transformation equations.

The introduction of these hypotheses further led physics even more into the wrong direction when Albert Einstein proposed the special theory of relativity (STR) and was widely accepted by the scientific community. Even though Lorentz's contraction hypothesis was unnatural (as described by Einstein himself) and wrong, it was not illogical. The idea of relativity of space and time introduced by Einstein was illogical, counter intuitive and has led to more paradoxes than it solved.

Einstein's theory was, inescapably, based on what it was supposed to disprove: the ether and the Lorentz contraction hypothesis. The argument is as follows. The Lorentz transformation (LT) equations were based on the ether because length contraction was invoked to compensate for the difference in path lengths of the longitudinal and transverse light beams which was in turn based on the presumption of the ether. This means that no length contraction would be required if there was no presumption of the ether in the first place. Therefore, if the LT equations are based on the ether and if SRT is based on LT, then SRT is also based on the ether. Einstein's derivation of LT cannot be considered as independent because Einstein knew about LT before he formulated SRT.

In principle, however, Einstein's prior knowledge of LT should not be a problem if his theory ( SRT ) was *truly* successful in solving the puzzle. We know that SRT has become a source of many paradoxes ( for example, the twin-paradox, the Trouton-Noble paradox) and has been disproved logically and experimentally[1].

Therefore, more than one hundred years after Einstein's publication of the theory of special relativity , the fundamental problem of motion and the speed of light remains unsolved to date.

However, although not yet accepted by the scientific community, this centuries old puzzle has already been solved for the first time in 2014 by this author [2], by a new theory called Apparent Source Theory.

In this paper, a brief qualitative explanation of the Michelson-Morley experiment 'null' result will be presented.

### **The Michelson-Morley Experiment 'null' result**

The crucial insight that eluded physicists for more than a century is formulated as follows .

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

This theory turns out to be a fusion of ether theory and emission theory, the two classical theories that have been wrongly seen as rivals for centuries [1].

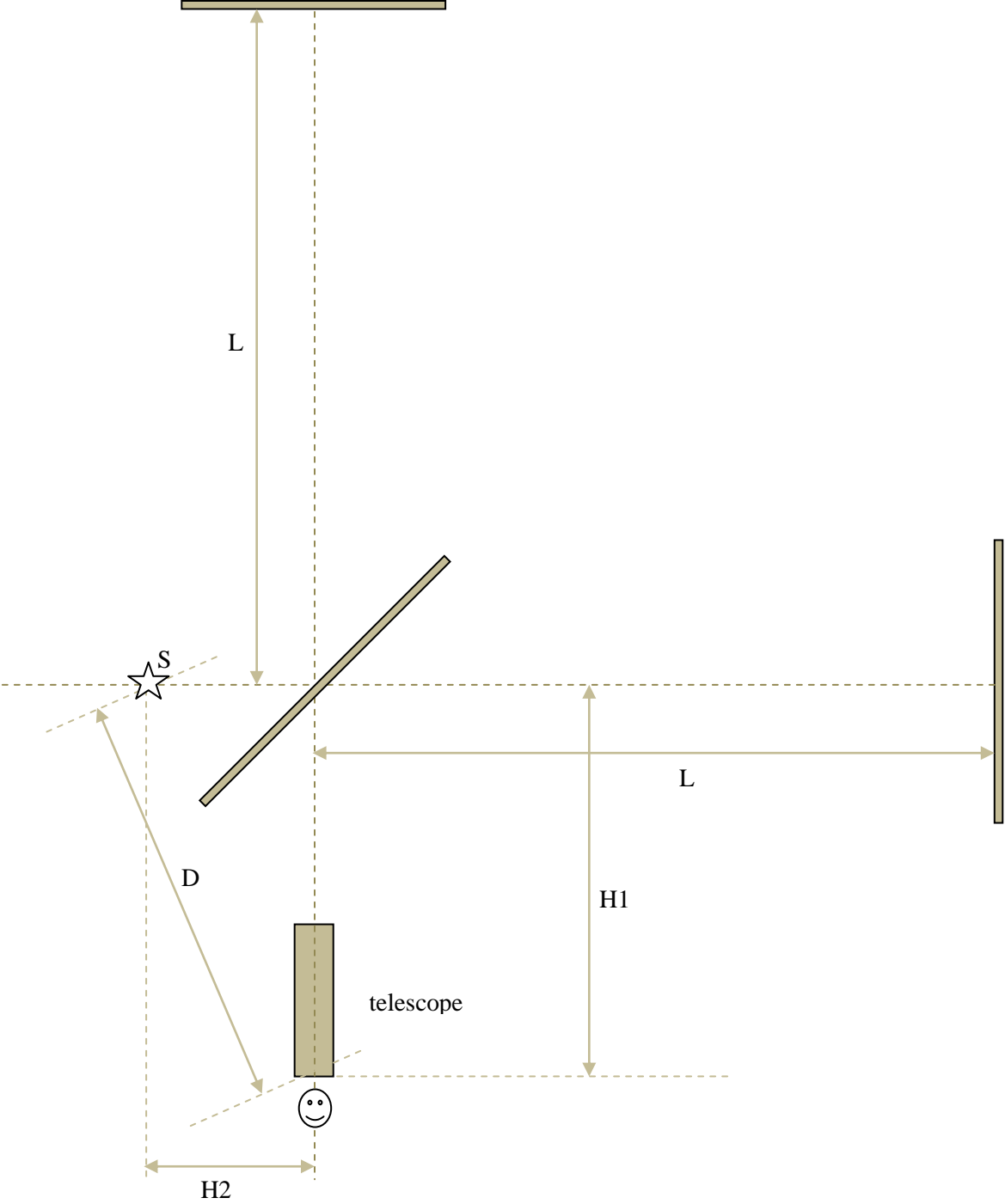
Let us apply this theory to the Michelson-Morley experiment.

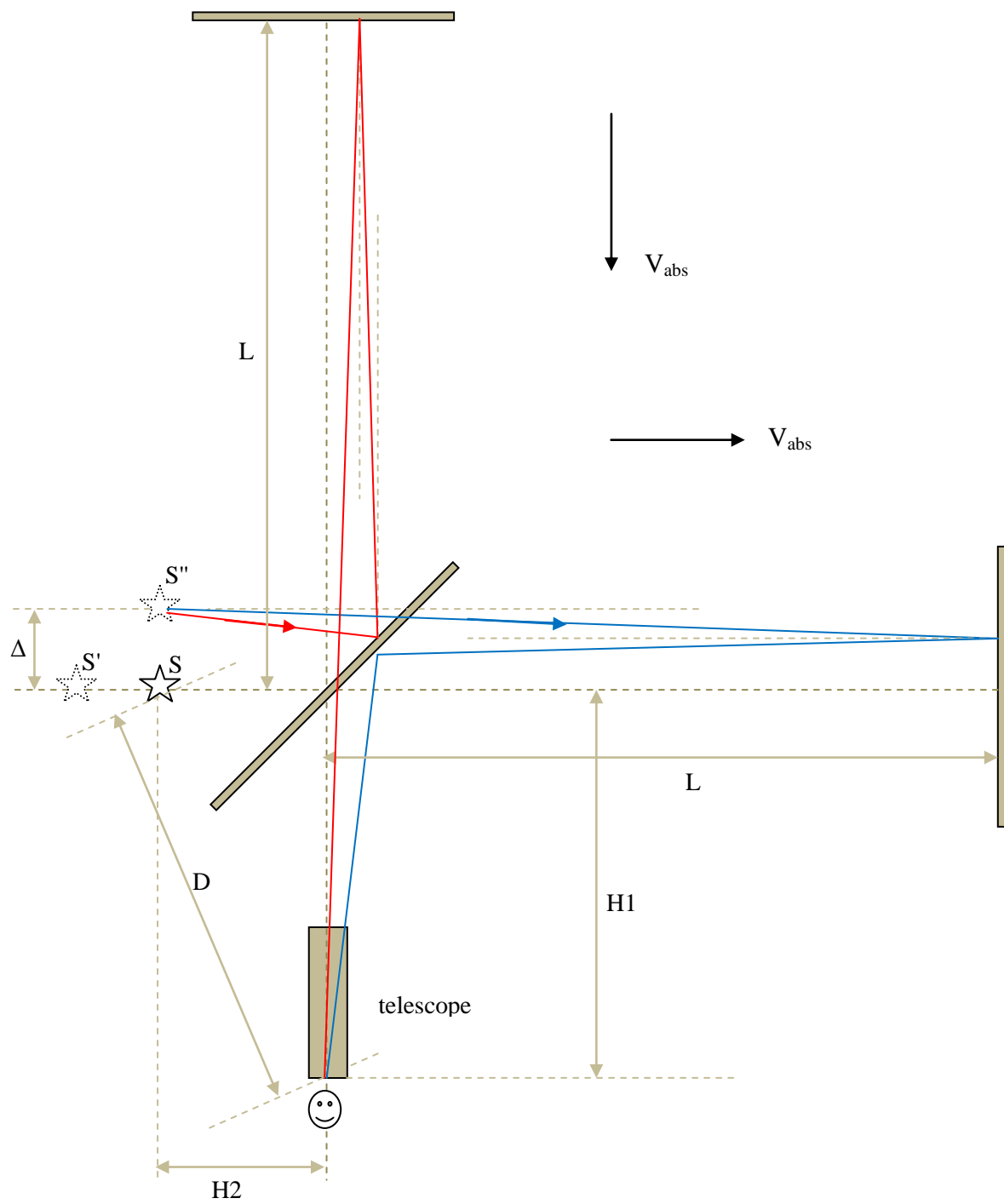
The *apparent* change in position of the light source relative to the observer is determined by the *direct* distance D between the light source and the observer/detector, the magnitude of the absolute velocity and the orientation of the source-observer line with respect to the Earth's absolute velocity vector. In the figure below, two cases have been shown.

In the first case, the absolute velocity  $V_{abs}$  is directed to the right. In this case, the position of the light source apparently changes from S to S', to the left. The experiment ( fringe shift) is analyzed by assuming the position of the light source to be S', and not S. In this case, no fringe shift is expected because, obviously, (apparent) change of the position of the source from S to S' doesn't cause any change in the difference in the path lengths of the longitudinal and transverse light beams. This is because the path lengths of both light beams are affected identically. Therefore, the Michelson-Morley experiment is completely insensitive to absolute velocities directed to the right. This is unlike the prediction of ether theory.

In the second case, the absolute velocity is directed downwards and the position of the source changes apparently from S to S". The red and blue lines indicate the ( ' virtual ' ) longitudinal and lateral light beams for this case. The small fringe shifts observed, such as in the Miller

experiments, are attributed to the difference in path lengths of the red and the blue light beams. The quantitative analysis of the fringe shift is somewhat tedious, yet a straightforward problem of geometry, so I will not undertake it here.





## **Conclusion**

In this paper a new interpretation of absolute motion and explanation of the Michelson-Morley experiment has been presented. The new theory ( Apparent Source Theory) states that the effect of absolute motion for co-moving light source and observer is to create an *apparent* change of position of the source relative to the observer. The procedure of analysis of the Michelson-Morley experiment, therefore, is to replace the real source S with an apparent source S', and analyze the experiment by assuming that the speed of light is *constant relative to the apparent source*. This theory turns out to be a fusion of ether theory and emission theory. This theory finally resolves the centuries old puzzle of the speed of light.

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

## **References**

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