

The Theory of Relativity - Misinterpretation of the Postulate of Constancy of the Speed of Light and Non-Existence of Equivalence Principle

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Abstract

The origin of all Lorentz's ether theory and Einstein's relativity theory is the constant c in Maxwell's equations and the null result of ether drift experiments. In this paper, it will be shown that it is the phase velocity of light that is constant c independent of source and observer velocity. The group velocity of light behaves in a more conventional way: it is independent of source absolute velocity, but depends on observer absolute velocity. Relativity theory has already been disproved because absolute motion has been decisively detected by many experiments such as the Miller, the Marinov, the Silvertooth, the Roland De Witte and the CMBR experiments. The group velocity of light has also been shown experimentally to vary with observer velocity. The counterintuitive constancy of the *phase* velocity of light is something that should be just accepted as a law of nature. It is rooted in the reality that there is no medium of propagation for light waves. This paper also shows that the beautiful thought experiment of the equivalence principle turns out to be wrong. The equality of inertial mass and gravitational mass has its root in two of the longstanding mysteries in physics: what inertial mass *is* and what gravity *is*. Inertial mass and electrical self inductance are not only analogous, but are fundamentally the same phenomena. The velocity of a car cannot change instantaneously for the same reason that the current inside an inductor cannot change instantaneously. Just as the magnetic field of an inductor cannot change instantaneously, so does the magnetic field of the electrons, protons and neutrons of the car material. Gravity and electrostatic force are not only analogous, but are fundamentally the same phenomenon. Gravitational force is a slight difference between electrostatic attractive and repulsive forces. It follows that both inertial mass and gravitational mass depend on the same quantity: the *total*(not net) amount of charge in an object.

Introduction

The nature of motion and the speed of light has confused physicists for centuries. Many conventional and modern light speed experiments have been carried out over centuries that gave results that defy any of existing theoretical frame works: the Special Theory of Relativity (SRT), the ether theory, the emission theory and all their variants. Physics today is in a situation in which each of these theories have their own supporting experimental evidences.

The Argo and Airy star light refraction experiments disprove the emission theory but do not support the ether theory exclusively either. The Michelson-Morley experiment clearly supports the emission theory by its null results. The emission theory has also other supporting experimental evidences: the Venusplanet radar range data anomaly (as pointed out by Bryan G Wallace) and the Lunar Laser Ranging experiment.

But moving source experiments and the Sagnac effect support ether theory and disprove emission theory. There are many experiments that have decisively proved our absolute translational motion in space such as the Miller, the Marinov, the Silvertooth, the CMBR and the Roland De Witte experiments. Even crucial is the fact that sidereal correlations have been detected in these experiments.

Other experiments also exist that do not appear to decisively prove or disprove the ether or the emission theory. These include the Bradley stellar aberration experiment and the Ole Roamer experiment.

This author has already proposed a theory called Apparent Source Theory (AST) [1] that successfully reconciles many of the above contradicting experimental facts. AST turns out to be a fusion of ether theory and emission theory in a novel way.

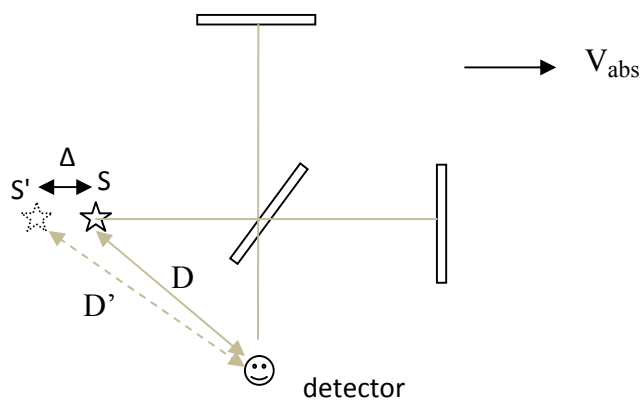
Apparent Source Theory

Apparent Source Theory[1] (AST) has already been proposed by this author to explain the Michelson-Morley experiment, the Sagnac effect, moving source experiments and many other experiments within a single theoretical framework. AST turns out to be a fusion of ether theory and emission theory in a novel way. Next we give a brief introduction to it.

We will present a new interpretation of absolute motion 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.

With this interpretation, the Michelson- Morley and the Kennedy-Thorndike experiments can be readily explained.



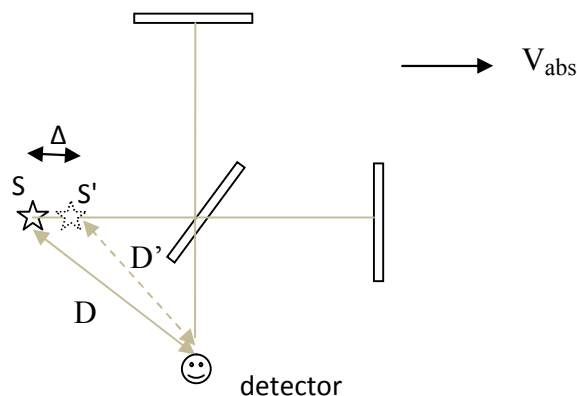
From the above diagram of the Michelson-Morley experiment, we see that the effect of absolute velocity is just to create an *apparent* change of the position of the light source *relative* to the detector, for absolute velocity V_{abs} directed to the right. The apparent change in position is

determined by the direct source-detector distance D , the orientation of the source-detector line with respect to the absolute velocity and the magnitude of the absolute velocity[1].

The procedure of analyzing the Michelson-Morley experiment is:

1. Replace the real source S by an apparent source S' , to account for the absolute velocity
2. Analyze the experiment by assuming that the speed of light is constant *relative to the apparent source* S' .

In the case of absolute velocity directed to the left, the apparent position of the source will be as follows.



The best way to understand the effect of this apparent change of source position is to ask: *what is the effect of actually, physically shifting the source from position S to position S' ?*

Obviously there will be no (significant) fringe shift because, intuitively, both the longitudinal and lateral beams will be affected identically. It is possible to prove this experimentally in optics.

Therefore, in the present case, the apparent shift of the source is common both to the longitudinal and transverse light beams and doesn't change the relative path lengths of the two beams and hence no (significant) fringe shift will occur.

Intuitive understanding of Apparent Source Theory - Modified Emission Theory

An intuitive approach to AST is to assume that the speed of light varies *relative to the source* so that it is constant c independent of source absolute velocity.

We know that the null result of the Michelson-Morley experiment could be explained in a most straightforward way by the emission theory of light. However, the emission theory was abandoned because of moving source experiments. We will see that physicists hastened to reject the emission theory which turns out to be a crucial part of the true theory of the speed of light.

The trick of nature is as follows. The emission theory basically explains the Michelson-Morley experiment. However, for emission theory to be compatible with moving source experiments, the speed of light should vary *relative to the source* so that the speed of light is independent of the absolute velocity of the source.

Imagine a light source in absolute motion and an observer at absolute rest. Suppose that the light source starts moving with (absolute) velocity V_{abs} towards the observer.



For the speed of light to be independent of the velocity of the source, the speed of light *relative to the source* should be $c - V_{abs}$ in the forward direction. Therefore, the speed of light relative to the observer will be the *sum* of source velocity (V_{abs}) and the speed of light relative to the source ($c - V_{abs}$):

$$V_{abs} + (c - V_{abs}) = c$$

In the case of an observer who is at absolute rest behind a light source moving with absolute velocity V_{abs} , the velocity of light is $c + V_{abs}$ in the backward direction *relative to the source*.



In this case the speed of light relative to the observer will be the *difference* between the speed of light *relative to the source* ($c + V_{abs}$) and the source absolute velocity (V_{abs}):

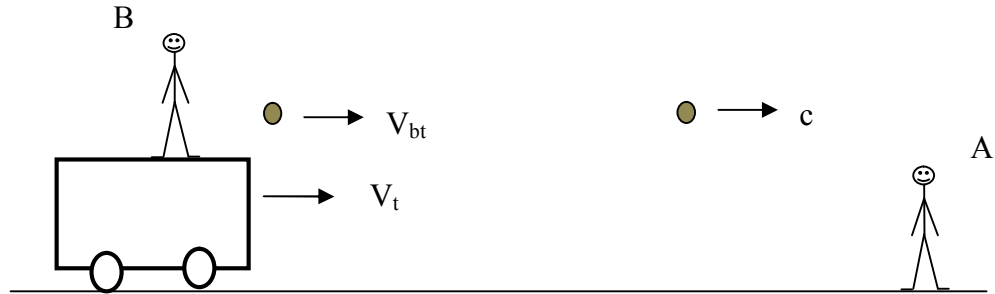
$$(c + V_{abs}) - V_{abs} = c$$

Therefore, we have shown that the speed of light is independent of the velocity of the source if we modify the conventional emission theory as above. This is a fusion of ether theory and emission theory. Note that the ether doesn't exist. By 'ether theory' we mean 'absolute motion theory' here. Although the ether doesn't exist (as disproved by the Michelson-Morley experiment), absolute motion does exist.

Therefore, the speed of light *relative to a source* moving with absolute velocity V_{abs} will be $c - V_{abs}$ in the forward direction and $c + V_{abs}$ in the backward direction.

To draw an analogy, consider a stationary observer A and a truck moving relative to A. Another observer B is on the truck, throwing balls in the forward or backward direction while the truck is moving. Suppose the truck (and observer B) moves towards observer A with velocity V_t . The

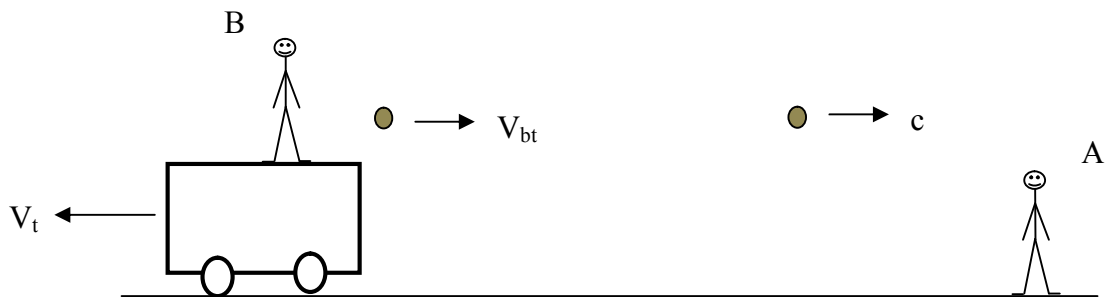
requirement is that observer B adjusts the velocity of the balls *relative to the truck* (V_{bt}) so that the velocity of the ball relative to the stationary observer is always constant c irrespective of the velocity of the truck.



$$V_t + V_{bt} = \text{constant} = c$$

If observer B throws balls towards observer A while the truck is moving away from observer A, as shown below, the velocity of the balls relative to A will be the difference between V_t and V_{bt} , which will be constant as above.

$$V_t - V_{bt} = \text{constant} = c$$



Therefore, the velocity of the balls relative to observer A is constant c independent of the velocity of the truck, analogous to the speed of light being constant c relative to an observer at absolute rest, independent of source velocity.

It is now easy to explain the null result of the Michelson-Morley experiment (MMX) by the modified emission theory above. In modified emission theory the velocity of light *relative to the source* depends on the absolute velocity of the source. Thus, in the MMX, a change in velocity of light *relative to the source* due to source absolute velocity will not result in a fringe shift because, intuitively, both the longitudinal and transverse light beams will be affected equally.

For a comprehensive description of AST the author recommends papers [5][6][7][8][9][10][11][12].

Experimental evidences against Einstein's relativity theory and Lorentz ether theory

1. Experiments that detected our absolute translational velocity in space such as: the Miller, the Marinov, the Silvertooth, the CMBR and the Roland De Witte experiments
2. Experiments that detected variation of group velocity of light with observer velocity, by using lunar laser ranging experiment[4]

The Equivalence Principle

The equivalence principle of General Relativity Theory (GRT) is usually considered as one of the most beautiful thought experiments in physics. It states that there is no way an observer in free fall in a gravitational field in a closed room can know whether he/she is in free fall in a gravitational field or moving inertially in free space, and vice versa. All the laws of motion is the same in both cases. It is also stated in another way as the equivalence of gravitation and acceleration. There is no way for an observer at rest on Earth in a closed room to know whether he is at rest in Earth's gravitational field or is accelerating in space free from gravitational field, and vice versa.

This thought experiment, for all its beauty, is wrong. This is because absolute motion exists, as detected by many experiments. If the observer in a closed room has a device that can detect absolute velocity, such as the Silvertooth experiment, then he can know whether he is in free fall in gravitational field or moving inertially in free space. The observer in free fall in Earth's gravitational field detects his acceleration as a continuous increase in absolute velocity, while the device of the inertial observer in free space shows constant absolute velocity. Likewise, the device of the observer at rest in Earth's gravitational field shows Earth's absolute velocity in space, which is constant in magnitude (about 390 Km/s) (let us assume constant direction for simplicity of argument), while the device of the observer accelerating in free space shows continuously changing absolute velocity.

Therefore, Einstein's thought experiment that an observer at rest in Earth's gravitational field will see the same bending of light seen by an observer in free space with corresponding acceleration is wrong. Einstein predicted this because he postulated the equivalence principle, because he was 'assured' that there is no other alternative explanation for the equality of inertial mass and gravitational mass. The observer accelerating in free space will see bending of light because his absolute velocity is continuously increasing, where as the observer at rest in Earth's gravitational field will not see any bending of light because his absolute velocity is constant. Likewise, the observer accelerating in free space will observe red shift where as the stationary observer on Earth does not observe any corresponding red shift.

Therefore, the equivalence principle and the General Theory of Relativity are wrong.

Equality of inertial mass and gravitational mass

Einstein developed the equivalence principle by starting from the well established phenomenon of equality of inertial mass and gravitational mass. At Einstein's time, and even today, there is no explanation in physics for this 'coincidence'. Einstein considered the equivalence principle would explain this 'coincidence'.

The mystery of equality of inertial mass and gravitational mass is rooted in the long standing mysteries in physics: what inertial mass *is* and what gravitation *is*. Einstein's theory doesn't explain the origin of inertial mass.

In paper[3], I have proposed that inertial mass is nothing but electromagnetic radiation reaction. The inertial mass of a car is due to the radiation reaction of all the electrons, protons and neutrons of the materials of the car. Electrical self inductance and inertial mass are not only analogous, but are fundamentally the same phenomena. We know that current in an inductor cannot change instantaneously because the magnetic field cannot change instantaneously. In the same way, the velocity of a car cannot change instantaneously because the magnetic field of its electrons, protons and neutrons cannot change instantaneously.

A question arises: how can cars (which are neutral) radiate electromagnetic waves ? What about neutrons, which are also neutral ? The answer is that an electron and a proton bound in the materials of an accelerating car radiate identically to free electrons and protons. A neutron in an accelerating car will also radiate electromagnetic waves because it is made of charged elementary particles. The presence of positively charged protons in the car material does not prevent radiation from the electrons. The radiations of positive charges and negative charges only cancel each other so that they are *not accessible*. It follows that the inertial mass of an object depends on the *total*(not net) amount of positive and negative charges contained in the object.

Gravitational force has been proposed as a slight difference between electrostatic attractive and repulsive forces[1][3]. Therefore, gravitational mass of an object also depends on the *total* amount of charges in the object.

Since both inertial mass and gravitational mass of an object depend on the *total* amount of charges in the objects, it follows that two bodies that have equal inertial masses will also have equal gravitational masses.

General Relativity

The General Theory of Relativity is wrong because:

1. the Special Theory of Relativity (SRT) Since space-time doesn't exist.
- 2.the equivalence principle is wrong (does not exist)
3. an alternative explanation of gravity exists: gravity is a net electrostatic force.

Experimental 'confirmations' of General Relativity ?

Now we raise an open question. It is said that experiments have confirmed GRT to high precision[13]. These experiments include:

1. gravitational red shift (the Pound-Rebka experiment)
2. deflection of light by the Sun
3. Shapiro delay

Mercury perihelion advance had already been successfully explained by Paul Gerber before Einstein by assuming finite (light) speed of gravity, which is consistent with AST [1]. According to AST gravity acts as if it has infinite speed and light speed at the same time: dual nature!

How is it possible for a wrong theory (GRT) to predict the outcome of experiments with such precision?!

Experiments on equality of inertial and gravitational masses have been considered as confirmations of GRT, which has been shown to be wrong.

Conclusion

Two theories have been proposed in this paper:

1. constant phase velocity, variable group velocity of light
2. Apparent Source Theory

These theories will explain many of the first order and second order ether drift experiments, hence undermining the foundations of Einstein's theory of relativity.

GRT has been shown to be wrong and irrelevant because: 1. the equivalence principle is wrong, 2. spacetime doesn't exist and 3. a compelling alternative theory of gravity has been shown to exist: gravity is a net electrostatic force.

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

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* The section on Doppler effect of the paper need to be corrected according to the new findings of the current paper.