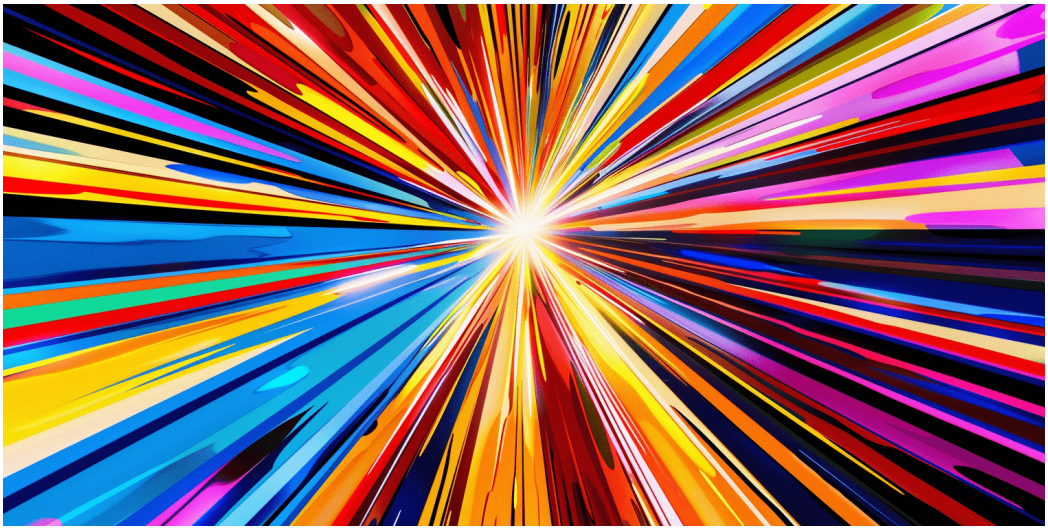

Fallacy of the Absolute Speed of Light

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Abstract

In this article, we have rationally analyzed the null result of the Michelson-Morley experiment, along with the unique observation that all electrodynamic phenomena, whether terrestrial, solar, or astral, are independent of the motion of the Earth, and we have shown that the absolute speed of light is fallacious.

Important observations on the behavior of light began to be performed from the time of Snell (1621), and important experiments on electricity and magnetism began to be conducted from the time of Coulomb (1783). Maxwell (1865) tried to unify both streams of knowledge and dared to realize what light was. There were numerous experiments to demonstrate that Maxwell's theory was correct, though some might argue that the theory was inadequate.

Ole Roemer (1644-1710), a Danish astronomer working in the Royal Observatory in Paris in 1676, determined the speed of light in solar space.

Galileo Galilei (1584-1642) discovered Io, the innermost of the four moons of Jupiter, in 1610. Roemer observed the time difference between two eclipses of Io. He recorded the timing of one such eclipse when the Earth's distance from Jupiter was minimal.

Jupiter travels around the Sun in 12 Earthly years. Therefore, in six months, Jupiter's displacement around its orbit will not be much. After about six months, the distance between Jupiter and the Earth became maximum, i.e., the first minimal distance + the diameter of the Earth's orbit around the Sun.

Roemer found that the observed timing of any eclipse of Io when the Earth is at maximal distance from Jupiter is 22 minutes later than the calculated timing based on the time differences of two consecutive eclipses of Io. Roemer concluded that 22 minutes is the time that light took to traverse the diameter of the Earth's orbit. As per Roemer, the speed of light in solar space is 2,14,000 km/sec.

Bradley, in 1747, observed that the overhead stars, if seen from the surface of the Earth, rotate around 19.8 seconds of an arc in a year. Bradley interpreted this as due to the relative motion between the Earth and the light beam in solar space. From that angle and the known velocity of the Earth around the Sun, he calculated the speed of light in solar space. As per Bradley, the speed of light in solar space is 3,01,000 km/sec.

Armand Fizeau, in 1849, used a beam of light reflected from a mirror 8 km away. "The beam was aimed at the teeth of a rapidly spinning wheel. The wheel's speed was increased until its motion was such that the light's two-way passage coincided with the movement of the wheel's circumference by one tooth." As per Fizeau, the two-way light speed on the surface of the Earth is 3,15,000 km/sec.

In Maxwell's theory, if *'c'* is considered to be the speed of light in free space, Maxwell's equations are then valid in free space, where the Earth is obviously moving with an appreciable velocity. Therefore, Maxwell's equations should be affected on the surface of the moving Earth.

But curiously, all electromagnetic phenomena, viz., reflection, refraction, diffraction, and interference, etc., of stellar, solar, and terrestrial light, as observed on the surface of the Earth, are independent of the movement of this planet.

The Earth is moving with a velocity of 30 km/sec in solar space. Therefore, the speed of light, if measured on its surface, must vary direction-wise. But Michelson (1881) and Michelson-Morley (1887) did not observe such an effect. This is generally called the null result of the M-M experiment (1987) [1][2].

To dissolve this problem, Einstein (1905) assumes that Maxwell's equations are invariant to all inertial frames, and this acts as the foundation of Special Relativity. This theory implies that the speed of light is absolute, i.e., independent of the motion of the observer. This assumption, though seemingly simple, has given birth to a fantastic world where inertial mass converts into energy, length contracts, and, more interestingly, time dilates with motion – a world suitable for fantasy lovers!

But why are all electromagnetic phenomena observed on the surface of the Earth independent of its movement? The answer may be very simple:

The electromagnetic fields and light possess momenta and energies that we could experience with our sense organs. Therefore, these are real physical entities (objects) [3][4].

All objects are subject to gravitation. Those that are carried with the Earth at the near vicinity of its surface and those that experience, too, the Coriolis force when they belong to the Earth system and move with respect to that system [5].

Electromagnetic fields and light act similarly.

Electromagnetic fields and light, being real physical entities (objects), should, therefore, similarly be subject to gravitation, and at the near vicinity of Earth's surface, they should similarly be carried with Earth as a part of the Earth system. They should, too, similarly experience the Coriolis force if they move with respect to that system.

This will at once explain the null result of the Michelson-Morley experiment and the non-null result of the Michelson-Gale experiment, assisted by Pearson, and give a transparent rational understanding of “Why the surface of the moving Earth acts as a free space?” [5]. In that case, the speed of light in the free space is ‘c’, and it changes for an observer steadily moving in free space. There is not a single proper experiment to show that the speed of light is absolute.

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