

The Failure of the Michelson-Morley Experiment was Caused by Their Misunderstanding of the Conservation of Linear Momentum

The Michelson-Morley Experiment

The interferometer was invented and developed in the 1880's by Albert Michelson in an attempt to establish experimental verification for the luminiferous aether that had been proposed in several different configurations by many earlier theorists. The Michelson interferometer was a very simple delicate device in which photons are emitted toward a half-silvered mirror set at a 45 degree angle. Half of these photons pass through the mirror to a second mirror where they are reflected back to the first mirror and reflected at a 90 degree angle toward the an observer. The second half of the photons are reflected at 90 degrees to a third mirror that reflects them back through the half-silvered mirror to the observer.

Michelson, as well as most other optical theorists, imagined that light was a wave disturbance that moved through an aether medium that was stationary relative to both Earth's rotation and its orbital motion around the sun. If their beliefs were true, it would mean that photons moving with and against Earth's motion would take longer to arrive at the observer than photons traveling the same distance at right angles to Earth's motion.

A half-silvered mirror was used to split the photons into two beams traveling at right angles to one another. After leaving this splitter, the beams traveled out to the ends of long arms of equal length where they were reflected back into the middle by small mirrors. They then recombined on the far side of the splitter in an eyepiece to produce a pattern of constructive and destructive interference whose transverse displacement would depend on the relative time it takes light to transit the longitudinal versus the transverse arms. If Earth was traveling through an aether medium, a light beam traveling parallel to the aether flow would take longer to reflect back and forth than a beam traveling perpendicular to the aether, because the increase in elapsed time from traveling against the aether wind is more than the time saved by traveling with the aether wind. After performing the experiment many times, it was found that both groups of photons always took the same time to traverse both paths no matter which way the device was rotated. The conclusion reached after many null measurements was that there was no luminiferous aether or if there was Michelson and Morley failed to detect it.

Then in 1905, Einstein replaced the word "aether" with his own peculiar aether-like medium called a "Spacetime Continuum". He then declared that his spacetime continuum contacted within the interferometer in the direction of its motion.

The actual physical explanation for the experiment's null results requires no such metaphysical assumption. It is simply a principle of measurement that all photons travel at linear c and spin at rotational C relative to Zero Momentum Rest. They get their motion at c from the splitting in two of stationary photons within atoms that are spinning in two different directions at the rotational speed of light C . A photon's linear momentum and energy are red and blue shifted by the absolute motion of its emitting atom but its linear and rotational velocities are always exactly c and C relative to ZMR.

Any small fringe shifts measured by a Michelson Interferometer are Sagnac effects caused by Earth's rotation.

Michelson Interferometer @ 1/3 c

