

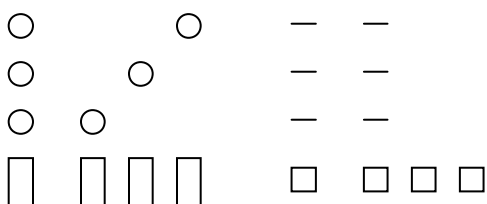
The Wave Model for Light

A MEMO to NPA

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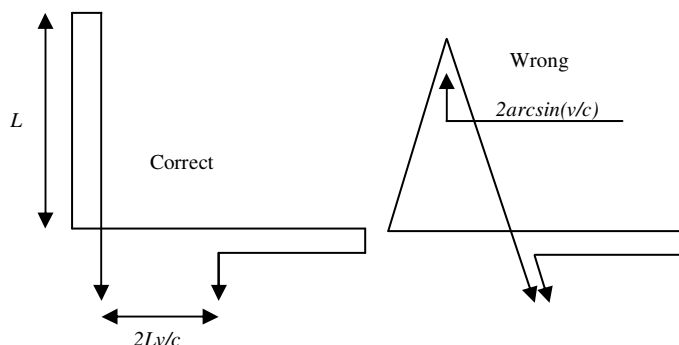
This article demonstrates that stellar aberration and Michelson-Morley's experiments (MMX) cannot tell us anything about the state of motion of the ether. Instead the Sagnac effect, observed in the global positioning system (GPS), demonstrates the effect of the ether wind in one-way propagation of light. A second order effect of the ether wind is also demonstrated in the speed variations in atomic clocks.

1. The Ether



The velocity of a bullet from a cannon is the vector sum of the motion of the cannon and the motion of the bullet in relation to the cannon that is the reference for the motion of the bullet. In the same way light in interferometers and from lasers light has been described as moving with constant speed in relation to test equipments. This idea is wrong if we will follow the wave model for light and light therefore must move in relation to the ether. This is assumed for longitudinal ether wind in MMX and must therefore also be valid for transverse ether wind. Plane wave fronts in light are defined by mirrors in lasers and interferometers and are always parallel to these mirrors. Light moves orthogonally to these mirrors in the frame of the ether independent of if the mirrors move inside the plane of the mirrors.

2. MMX



The assumptions above imply that transverse ether wind is irrelevant in MMX. Only wave front normal is relevant. The fact that returned light hits a point on the mirrors that is $2Lv/c$ shifted is not observable in the interferometer, since the interferometer is sensitive in one dimension only and transverse ether wind is irrelevant.

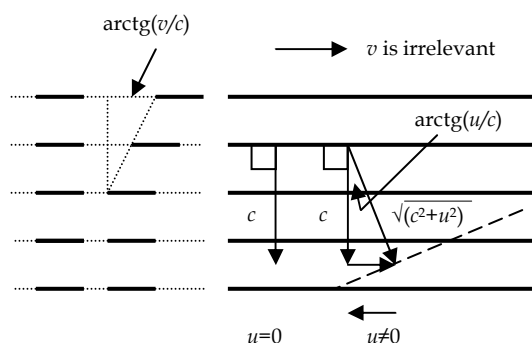
MMX observes the effect of an ether wind on the 2 way speed of light moving sequentially forth and back between 2 mirrors.

The atoms in a crystal control their separations by means of the ether. The separation between atoms depends therefore on changes in the ether produced by the atoms and moving *simultaneously* in 2 opposite directions with the speed of light. The separations between the atoms are therefore reduced by the same amount as the 2 way speed of light. This means that the effect of a longitudinal ether wind is compensated by contraction of physical objects. Therefore, we cannot *observe* the effect of a longitudinal ether wind in MMX, although the effect is *real*.

3. Atomic clocks

Bound electrons move forth and back in relation to the ether wind in the plane of the electron's orbit (like light in MMX). The electron's motion can depend on the ether wind in the same way as light's motion. This means that the effect not observable in MMX can be observable in atomic clocks. A second order effect of the ether wind is slowing atomic clocks. A misunderstanding of this effect has produced the idea of time dilation.

4. Stellar aberration



Transverse ether wind v does not change the normal to the wave front.

A change u in the in the state of motion of the observer creates the illusion of a change in the orientation of the wave fronts. u has the same effect when light is considered as waves as when the particle model is applied. Stellar aberration depends on u but not on v . Stellar aberration is therefore *useless* in relation to the ether wind.

5. Sagnac effect

The Sagnac effect is a first order effect of a longitudinal ether wind. This is demonstrated by the compensation for translational motion of time stations on our planet when their clocks are compared in the global positioning system (GPS). The effect is caused by the rotation of our planet. A *misunderstanding* of this effect has produced the idea of multiple time concepts.

6. Conclusions

MMX, as well as stellar aberration, cannot tell us anything about the state of motion of the ether. The effect searched in MMX is observable in atomic clocks. The Sagnac effect in GPS demonstrates that the ether's state of motion depends on our

planet's translation but not on its rotation. Spherical symmetry can explain this. Changes in clock speed have been interpreted as time dilation. Contraction of objects has produced the zero result in MMX.

Remark

This article is too short for being reviewed. If someone should be interested in reviewing he should instead do it on [1]

Reference

- [1] John-Erik Persson, "The Falling Ether", Proceedings of the NPA 2013 available at www.worldsci.org/people/john-erik_persson