The Mysterious Ether

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Evidence for the ether's existence and state of motion are explained. Methods for finding more knowledge about the ether are explained.

Background

There are 4 main models for the speed of light:

I	**c**	Relativity and no ether. The standard model.
II	**c+v**	Absolute ether and preferred *frame*. Most dissident's model.
III	**c+v(r)**	Entrained ether and preferred *field*.
	a)	Translated and rotated by the Earth (old model).
	b)	Translated, *not* rotated by the Earth (called generated).

Misinterpretation caused an imagined conflict between the Bradley effect and III, which therefore was abolished. *Misinterpretation* also caused an imagined conflict between the Michelson effect and II, which therefore was abolished. *Misinterpretation* of the Sagnac effect as an effect of rotation (not translation) eliminated a real conflict with I, and I was chosen in error. SRT is therefore a result of *three* important mistakes.

Detecting the Ether-Wind

It is verified that the Sagnac effect can detect *relative* velocities in circular and linear motions. To find the ether's state of motion (the ether-wind, an *average* value) means measuring an *absolute* velocity. This should be done in a lab with an unchanged separation between a light source and a detector, which means based on Sagnac effect, to produce an unambiguous verdict. Since we are in conflict with the clock synchronization problem (Perfect synchronization between separated clocks is not possible.) we must find a way to circumvent that problem.

The global positioning system (GPS) represents a kind of circumvention of the clock synchronization problem (But it is not done in a lab.). GPS is based on the using of more than two satellite clocks, which means that a *constant* error in the receiver's clock is made irrelevant. Positioning based on *one-way* light is thereby possible. Compensation for Sagnac effect is done in GPS, and coordinate differences in an east to west direction are based on light-speeds *c+v* and *c-v,* where *v* is ether-wind. This can indicate an ether translated, but not rotated, by the Earth (generated ether), i e an ether-wind blowing in western direction and caused by the rotation of the Earth. This interpretation means isotropic light-speed in relation to the centre of our planet, but in most parts of our planetary system it is related to the centre of that system (approximately the centre of the Sun). Further out it is related to the centre of our galaxy, and so on. The ether's state of motion depends on distribution of matter and its velocity must therefore be represented by a preferred field (not a preferred frame). This is explained in [1], where the ether is described as an omni directional flow of neutrino-like particles with very small mass and high velocity.
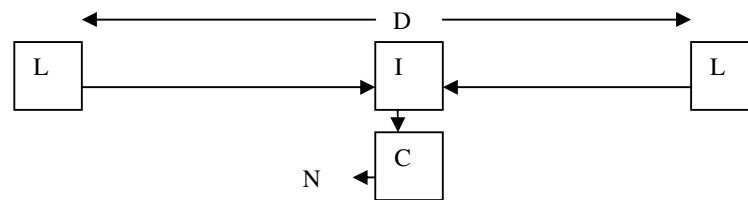

Fig. 1 Detecting Sagnac effect on a rotating platform.
L=Laser   I=Interferometer   C=Counter

The ether-wind can be detected in a lab in such a way as to making *constant* time between clocks (or frequency difference between oscillators) irrelevant. See [2] and[3]. The easiest known method is described by C C Su in [2]. The idea comes from a test with atomic clocks connected over some kilometres with coaxial cables. Dr Su suggested scaling down and connecting two gas lasers over a few meters with single mode optical fibres. The equipment is mounted on a slowly rotating platform with high mechanical stability. The measurements are made in such a way as to making a *constant* frequency difference irrelevant. Fig. 1 demonstrates the method without synchronized clocks. It is probably the easiest method since light is transmitted in cables and not in open air. This makes sensitivity to vibrations less. The platform rotates slowly around a vertical axis, and the platform must have good stability to avoid vibrations (optical table). Two gas lasers (HeNe) with high frequency stability are used together with mono-mode optical fibres. The difference in laser frequencies is low enough to

fall inside the bandwidth of detector and following video amplifier driving a counter. Perhaps the lasers must be individually chosen to the purpose of producing low frequency difference. The counter is not stopped, but sampled by a computer each time direction is pointing east or west. To avoid the ether-wind's effect inside the lasers they are mounted with their cavities in a vertical position. With λ=3.3μm (HeNe), D=5m should be enough to give significant result. The ether-wind v is derived from data according to the following. (η=Refractive index>1).

$$\Delta N_{2n} = N_{2n} - \frac{N_{2n+1} + N_{2n-1}}{2}$$

$$\overline{\Delta N} = \frac{1}{n}\sum_{n} \Delta N_{2n}$$

$$\frac{2v}{c} = \frac{\lambda \overline{\Delta N}}{\eta D}$$

An alternative method is a fast sampling of the time function $N(t)$ and than applying Fourier transformation. This demands a very constant speed of rotation. As alternative to the platform a boat can be used, but more vibrations can demand a longer wavelength. We want to detect an effect about hundred times greater than Michelson's.

What is the ether?

Knowledge of the ether is almost nonexistent, and the word 'ether' is sometimes a taboo. However, the experience from GPS provides some indications, due to the need to compensate for a Sagnac effect in relation to the centre of our planet, about 10^{-6} of c. This compensation is an evidence for an ether-wind generated by the rotation of the Earth. A possible model for the ether is an omni directional flow of fast particles with very small mass. ('Ether-wind' is referring to an *average* velocity.) A similar flow of similar, or identical, particles can explain a pushing gravity by a shadowing effect. ('Shadowing' referees to a *partial* effect.) If the shadowing effect no longer is *partial,* this effect can define an upper limit on the gravitational field. This can happen when all particles are absorbed, for very, very big bodies.

The ether appears to be an important hypothesis, for instance as an intermediator between matter and light, whereby light quanta can be abolished. Inertia can be explained by a wave function with *physical,* reality analogous to a ship moving in water. Energy can be needed to change the wave function. The dualism in Planck's radiation law can be explained by two kinds of radiating charged particles, i e electrons and protons. The ether hypothesis can therefore substitute many unnecessary hypotheses.

Remarks

The cosmic background radiation (CBR) appears to indicate a velocity as high as 10^{-3} of c. This must be interpreted as valid in relation to very distant sources. If such a high ether-wind was blowing inside our planetary system the GPS system would be very complicated due the need for compensating the Sagnac effect of 10^{-3} of c.

The generated ether appears to be related to the gravitational field, and can therefore perhaps have a vertical, negative velocity component (falling ether). This can possibly open a way to explain the Pioneer anomaly as a 'false' Doppler effect. A range dependent, radial ether-wind, $v(r)$, creates a frequency shift of $2[v(r_1)-v(r_2)]/c$, but radar range is not disturbed (only second order effect).

It has not been known to this author till very recently that supports for here presented ideas is present in research since many years by Gary Vezzoli and William Stanley. References to different articles by Vezzoli and Stanley can be found in [4] and [5].

References

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