

# Ethereal Ether and Michelson's Mystery

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The mysterious ether is discussed regarding transmission of light and gravity. Michelson-Morley's experiments (MMX) are explained.

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## Background

Einstein's definition of multiple time concepts is against fundamental logic. This fact is clearly demonstrated by Harald Nordenson in [1]. The search for alternatives to the theory of relativity is separated into two main categories of ether. One alternative, advocated by many, is an autonomous ether represented by a preferred *frame*. The other alternative, advocated here, is an entrained ether dependent on the distribution of matter and represented by a preferred *field*.

The experiments by Michelson and Morley, called MMX, have been repeated for about 100 years and always failed to fulfill the prediction.

## The ethereal ether

The wave motion of light is defined by a differential equation of second order in  $\mathbf{r}$  and  $t$ . We can therefore expect a solution dependent on  $\mathbf{r}$ ,  $t$  and  $d\mathbf{r}/dt=\mathbf{v}(\mathbf{r})$  representing the state of motion of the ether with a vector field. Wishful thinking and assuming  $\mathbf{v}(\mathbf{r})=0$  produced conflicts and absurdities in the theory of relativity, and it is against all logic to assume environment to adapt to every observer. Another idea assumed  $\mathbf{v}(\mathbf{r})=a$  constant (vector) resulted in the autonomous ether represented by a preferred frame. This idea predicts retardation in planetary motions due to friction with the ether. The existence of such a friction is proved by the ether's capacity to impose gravity force on matter.

The global positioning system (GPS) collects data from satellites near Earth. These data are handled in a frame with the velocity of the centre of our planet. That means they are corrected for the Sagnac effect that is observer's speed in relation to the centre of our planet. In systems with very long base interferometers (VLBI) data from very distant pulsars are collected. These data are handled in a frame with a velocity equal to the centre of our sun. That is also a Sagnac correction (eliminating stellar aberration), but in this case it is related to the centre of our sun instead of the centre of our planet. This means that we use different frames for different heavenly bodies. These frames are therefore not real frames but only approximations to one preferred *field* dependent on the distribution of matter. This fact, together with the fact regarding planetary motion, refutes the idea about a preferred frame. Instead we need a preferred field, which means an entrained ether. The theories of invariance and of autonomous ether are disproved.

Planetary motion without retardation can be explained by spherical symmetry in the ether-wind  $\mathbf{v}(\mathbf{r})$ . We can assume the ether to be falling towards a body and thereby making the sum of frictional forces inside the body equal to zero. This vertical ether-wind can also explain and generate gravity.

Ether-wind and gravity are apparently intimately related and this indicates that the entrained ether is entrained in translation but not in rotation. This means no invariance and no preferred frame and only one preferred *field* dependent on the distribution of matter. This falling ether can be assumed to transmit light as well as gravity. Such a falling ether was described by Le Sage, but deviates from Newton's theory in one respect. Le Sage predicts gravitational shielding, but Newton does not.

The effect of gravitational shielding is however very small and experiments to confirm the idea have failed. Approximation of gravitational shielding by zero can therefore be reasonable and result in a unification of Le Sage and Newton. Le Sage can explain Newton and Newton can make Le Sage's idea usable. Planetary motion without retardation is thereby produced for one body. Two bodies near each other are destroying the symmetry for each other by a shadowing effect and are therefore pushed towards each other. That is pushing gravity. Pushing gravity is stationary, without aberration, and based on particles. Only *changes* in gravity are transmitted with a finite speed, probably  $c$ .

### **Michelson's mystery**

Michelson invented a differential method to detect small changes in propagation time for light moving forth and back between mirrors. The resolution was enormously high and Michelson could change the azimuth angle of the equipment. Light speed is reduced when light moves in direction towards the ether-wind, but most of the loss is regained in the opposite direction. However a very small reduction remains as a second order effect. Michelson considered it possible to detect a second order effect  $10^{-8}$  of our planet's orbital motion of about  $10^{-4}$  times light speed. However, since the ether is entrained, an available effect, due to the rotation of our planet, is only in the order of  $10^{-12}$ .

The atoms in a crystal produce fields in the ether and these fields are assumed here to control spacing between the atoms. An alternative explanation is not easily found. Changes in the atom's effects on the ether-wind move with speed  $c$  in relation to the ether. These effects are changes in the ether just like light and these effects follow also Maxwell's equations. The exchange of information between atoms in a crystal is therefore dependent on the ether-wind in the same way as in two-way light in Michelson's test. Therefore a remaining second order term is produced in the spacing between the atoms. The only difference between effects between atoms and between mirrors is that flow of information is sequential in light but simultaneous in controlling atom's positions. Times are added between mirrors and effects of times are added between atoms. The total effect's total results are probably the same, considering the fact that the relative effects are very small. The searched effect in light is therefore compensated in the crystal. This explains the hundred years of zero results with MMX, since MMX is useless. Michelson's results are thereby explained by classical concepts only.

### **The speed of atomic clocks (A hypothesis)**

It is possible that an electron circulating a kernel can be affected by the ether-wind inside the plane of the electron's orbit in the same way as the effect on light. In the direction of the ether-wind the electron's speed can be increased and reduced in the opposite direction. The electron's speed  $u$  can be proportional to light speed  $c$  (although  $u$  is much smaller than  $c$ ) since they are both defined by differential equations of Maxwell's type. We can assume  $u_1 \sim c_1 \sim (1 \pm \beta)$  with  $\beta = v/c$  and get for two-way speed of light and electron motions  $u_2 \sim c_2 \sim (1 - \beta^2)$ . This means that  $\Delta f/f = -\beta^2$  for atomic clocks. For

ether-wind orthogonal to the plane of the electron's orbit  $\Delta f/f=0$ . If the satellite is rotating between these two positions we get  $\Delta f/f=-\beta^2/2$ , since the mean value of  $\cos^2\theta$  equals  $1/2$ . If this hypothesis is true the effect in vain searched in MMX is instead observable in atomic clocks. Instead of dilation of *time* we have a *physical* change in the speed of the atomic clocks. Instead of revealing this behavior of atomic clocks the effect was blamed on time per se and called dilation.

### Remarks

The entrained ether, represented by a preferred field, has by most scientists been considered as refuted by stellar aberration. However it has been stated in [2] and [3] that stellar aberration and Airy's test are manifestations of *observer's* motion related to light speed and not at all related to the *ether's* state of motion. This was demonstrated by the fact that the motion of a wave front depends on the ether-wind in one dimension only and the fact that telescopes detect wave front *orientation* and not particle *motion*.

The Sagnac effect has been classified as a rotational effect. However, it has been stated in [2] and [3] that Sagnac effect is a *translational* effect. This follows from the fact that the effect is distributed along a *line* and not over an area. When Sagnac effect is classified as translational the effect can provide an evidence for an ether-wind. The corrections for the effects in GPS and in VLBI support an ether that is translated in translation, but not in rotation.

### Summery

Many dissidents want to substitute relativity theory by an ether theory. However, most of them want an autonomous ether represented by a frame. The third alternative, the entrained ether, was abolished due to ignorance about the fact that a wave front cannot be bent by ether-wind inside the front. The fact that planets move without retardation is in conflict with autonomous ether, since the presence of gravity implies friction. Existing friction can be combined with no retardation only if there is spherical symmetry in the ether-wind. The idea of an autonomous ether is also contradicted by the experiences from GPS and VLBI. Signals from nearby satellites must be handled in a frame different from signals from very distant pulsars. This implies a different frame for every heavenly body. We can conclude from this that these frames are not real frames, but only approximations to only one ether represented by a *preferred field*, that is dependent on the distribution of matter. These demands can be fulfilled by a falling ether, and such an ether can generate gravity by a vertical ether-wind, according to *classical* concepts only.

The atoms in a crystal control relative position by means of the ether and are therefore in a two-way communication with each other. Michelson used two-way communication to study the ether-wind. The ether-wind has the same effect in both cases. The searched effect is therefore compensated by changes in atomic separation. This explains the zero result in MMX during hundred years by *classical* concepts only.

The theory of relativity assumes multiple time concepts and predicts many absurd phenomena like dilation of time and space. The search for an ether theory is therefore important. The possible introduction of an ether theory is prohibited by the fact that there is no consensus regarding the question: *Is the ether entrained or autonomous?* The discussion regarding the ether is therefore *very* important.

## **Conclusions**

We need an ether, but the ether cannot be autonomous, since such an ether is in conflict with planetary motion without retardation and results from GPS and VLBI. The ether must be entrained and represented by a preferred field. An apparent conflict with stellar aberration is only an illusion.

Gravitation is a stationary condition in the ether, as demonstrated by the lack of gravitational aberration.

MMX is useless.

There is a real possibility that the effect searched in MMX is observable in atomic clocks.

## **References**

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