

# Illusions and Reality in Relativity

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The interpretations of phenomena behind the theory of relativity are discussed and analyzed. Theories, different from those founding the theory of relativity are presented. It is demonstrated that classical concepts can explain most observations. It is therefore concluded that the exotic and absurd theory of relativity is not necessary. Instead of Einstein's theory we need to include the concept of ether.

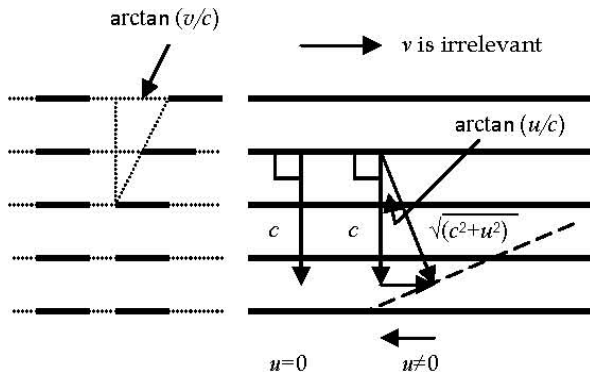
**Keywords:** Relativity, stellar aberration, Sagnac effect, Michelson-Morley, light bending.

## 1. Background

Interpretation of observed data is the important link between experiment and theory. The ether concept is very difficult to understand since it is invisible and we must observe light instead of ether. Light is not directly visible either and we must observe light's effects on matter, like electrons or ions, instead.

After many failures to confirm the ether hypothesis impossibility was concluded. To conclude impossibility from many failures is bad logic and bad science. However in everyday life it is often necessary.

## 2. Light Waves and Ether Particles



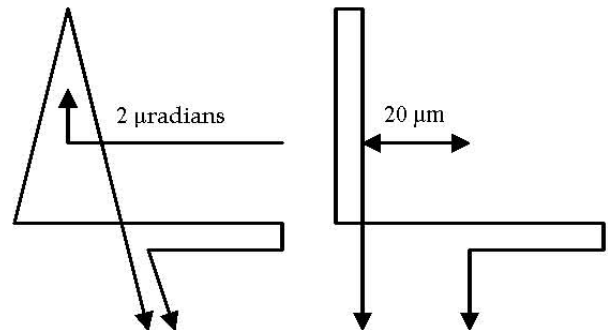
**Fig. 1a.** Transverse ether-wind  $v$  does not change wave front normal. **Fig. 1b.** Observer's motion  $u$  creates the illusion of a changed direction to a fix star (Bradley's idea).

Einstein contributed to the understanding of the photoelectric effect by introducing the material specific work function. From the fact that higher light frequencies produce faster photo electrons he concluded that light was constituted by particles. However, this second contribution by Einstein was not as good as the first one since the so called wave or particle confusion resulted. If we allow the ether to exist, and contribute to the energy balance, we can unite the phenomenon with the wave model also. This is possible if we assume conserved kinetic energy in the electrons and that light waves interfere with electron particles. Interference between light waves and electron particles can also explain the behavior of Crooke's radiometer, a phenomenon that has not got a clear explanation earlier. Reflected light in opposite phase on the white surface can reduce the total field on the white surface, and thereby reduce the number of emitted photo electrons and less recoil. If light were massive particles the white surface would take up most momentum after both retarding and acceler-

ating electrons. The photoelectric effect supports thereby the wave model for light.

Wave to particle interference is observed in atomic clocks and can explain Compton effect and Mössbauer effect also. We only have to assume X-rays and  $\gamma$ -rays to be wave packets very concentrated in time and space. The wave model for light has also many other supporting phenomena like interference and refraction. The high resolution in images of fix stars is also a very strong support for the wave model. Light can be described by the wave model only. The need of assuming wave to particle dualism is an illusion. The statement that light is both wave and particle is in fact no less than magic. These questions are also treated in an earlier article [1] to *Physics Essays*.

Polarization in light means that light oscillates in two directions transverse to propagation of light and inside the wave front. Light has only one degree of freedom in a right angle to the wave front. Therefore the ether defines the speed of light, but ether motions inside the wave front are irrelevant for the wave motion as long as they are equal over the wave front. Wave speed  $c$  is universal in empty space (containing only black matter) and if the ether-wind is the same over the wave front we must conclude that all points on the wave front behave equally (although individually defined). See Fig 1 where it can be seen that wave front normal is conserved in relation to transverse ether-wind. Transverse ether-wind is therefore irrelevant for wave motion and we must describe wave motion by scalar addition of the ether-wind's longitudinal component to wave motion or  $c(1 + v_L/c)$ .



**Fig. 2a.** Wrong and **2b.** correct interpretation of Michelson and Morley's experiments, since the transverse ether-wind cannot change direction of the normal to the wave front (Entrained ether)

The irrelevance of transverse ether-wind has very dramatic consequences. We cannot draw any conclusions about the ether

from assumed transverse effects. Stellar aberration is just an illusion and useless regarding ether-wind. Transverse ether-wind cannot motivate Stokes' reduction of Michelson's prediction by 50%. The light clock can't be used to derive time dilation (Fig. 2).

Bending of a wave front in light is possible only if  $v_L$  has *different values* over the wave front. This means that  $v_L$  is no longer considered as universal and  $\nabla v_L \neq 0$ . In this case we get a bending equal to  $\int \nabla v_L dL$ . This bending (caused by the component, longitudinal to light, from an ether-wind blowing in direction towards the sun) can explain the small bending near our sun of about  $10^{-5}$  radians if a vertical ether-wind of  $1.46 \times 10^{-3} c$  is assumed as a consequence of our hypothesis about a *vertical* ether-wind equal to the horizontal. Since the effect is strongest near the Sun we find that speed increase causes bending away from the Sun and decrease the opposite. This is described in Fig 3. This explanation is needed since we consider light to be waves without mass. We can therefore not explain the bending by gravity as Newton and Einstein did.

The explanation given above explains the bending of light near our sun, but cannot explain the delay of radio signals called Shapiro delay observed in radar echoes that are passing very near our sun. This fact can indicate two different mechanisms behind these two effects. The bending is produced by a gradient in longitudinal ether-wind, but the time delay is probably caused by a change in wave velocity,  $c$ . The reason to changes in  $c$  is not addressed here.

Fatio and Le Sage have demonstrated that ether based on particles can explain gravity without the wave model. They assumed a flow of particles that was slightly reduced when passing through great heavenly bodies. Fewer particles are therefore leaving a body than approaching it. This fact can explain the gravitational force by a kind of asymmetry in the particle flow. This could also make it plausible that a vertical and negative ether-wind is generated. This ether based on particles only and light based on waves only means a possibility to get rid of the magical wave or particle confusion.

In an earlier article [1] was the bending near the Sun estimated and found to be in agreement to  $10^{-5}$  (which is the observed value). As a hypothesis the *vertical* ether-wind was assumed to have the same magnitude as the speed of a satellite in circular orbit on the same altitude (7.91 km/s near earth).

### 3. Stellar Aberration

We can only observe relative motion. This simple fact can cause our own motion to be interpreted as a motion in opposite direction in an observed phenomenon. Most people have observed this illusion from a train on a railway station. It can sometimes be difficult to decide whether the train you are sitting in, or another, observed train, is moving. The same effect can cause vertically falling raindrops to appear to be falling in a not vertical direction. The effect is often called the raindrop effect. This effect is the same for a particle as for a wave motion. This is demonstrated in Fig. 1. The changed orientation of the wave fronts is not real, but an illusion that is generated when simultaneous information from two points on a wave front are joined together into a point in the middle between them. If correction for the

Sagnac effect is not done the orientation of the wave front *appears* to be bent. In a telescope the same effect can be explained by the detector's motion in the time between focusing and detection.

This interpretation of stellar aberration as an illusion caused by raindrop effect is Bradley's old model. This model agrees very well with observation and is also the most logically sound model.

Stellar aberration depends on  $c$  and  $u$  but is independent of the ether-wind  $v$ . Since observer's speed  $u \ll c$  and only transverse component in  $u$  produces an observable effect it is enough to consider the case where  $u$  is orthogonal to  $c$ . In this case we get a change in observed direction equal to  $\arctan(u/c)$  in relation to real direction. (Speed is changed from  $c$  to  $\sqrt{c^2 + u^2}$ .) We

can therefore conclude that stellar aberration is just an illusion produced by our own state of motion. Stellar aberration is therefore irrelevant in relation to the ether-wind and cannot rule out the entrained ether as Einstein stated in a letter [4] to E. Gehrcke in 1918. The wrong interpretation of the aberration in starlight is caused by ignorance of light's capacity to travel independent of transverse components of ether-wind. It is this capacity that makes sound waves *useless* as a model for light waves. (The fact that we have no external reference means that we only can observe changes  $\Delta u$  in  $u$ .)

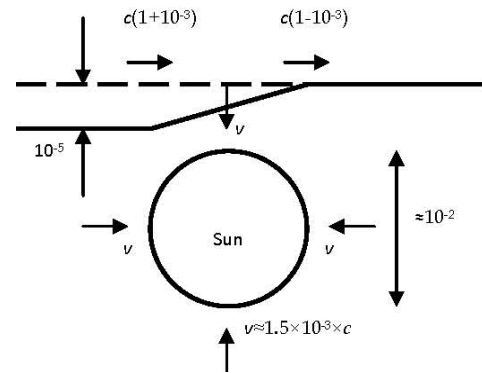


Fig. 3. Light bending near the Sun caused by a gradient in longitudinal ether-wind.

Stellar aberration is therefore just an *illusion* caused by our own unnoticed motion. This fact produces a wrong perception due to the finite speed of light. This was known to Bradley 300 years ago but was ignored 100 years ago.

### 4. Airy's Test

Airy filled a big telescope with water and wanted to see if the reduction of light speed by about 3/4 would increase stellar aberration by 4/3. This is however useless since the refraction in the surface from air to water reduces small angles by 3/4, and the effect is compensated. Airy was probably not aware of this compensating effect.

It has sometimes been stated that the compensation could be eliminated by air around the detector, but some millimetres of air does not help when the compensation has worked over a meter.

### 5. Michelson and Morley

Michelson and Morley studied the ether-wind's effect on light going forth and back between mirrors. They tried to detect a very small effect in time for two-way propagation.

The atoms in crystals produce force fields in the surrounding ether that become dynamic fields due to the ether-wind. These fields establish a two-way communication between atoms and are the basis for controlling the separation between the atoms. Information is flowing in both directions between atoms defined by the same differential equations that control the speed of light. The speeds of information transfer are therefore  $c \pm v$ . The two-way information flow is simultaneous between atoms but in sequential form between Michelson's mirrors. Since  $v \ll c$ , we can assume that the two effects are of the same size. This means that the inter-atomic spacing is reduced to the same amount as two-way speed of light. This is described in Fig 4. The time for propagation is constant, which explains why the method has produced zero results for hundred years.

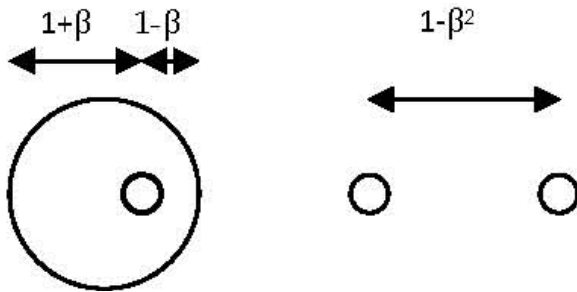


Fig. 4a. The ether-wind produces an asymmetry in the atoms effect on the ether. Fig. 4b. The spacing between atoms is reduced just as much as two-way speed of light.

Michelson's method is problematic in another respect also. He assumed an available ether-wind of  $10^4c$  due to orbiting instead of  $10^6c$  due to rotation of our planet.

### 6. Sagnac Effect

The Sagnac effect is used in fibre optic gyroscopes to measure angular velocity without external reference. Light following a closed path in the form of a circle with circumference  $L$  in an equipment rotating with tangential velocity  $v_L$  produces a delay in time for light propagation equal to  $\Delta t \approx Lv_L/c^2$ . According to a theorem by Stokes an integration of tangential velocity along a closed line can be substituted by integrating angular velocity over the area enclosed by the line. We have therefore a mathematical ambiguity that we must solve with physical arguments. We must decide if Sagnac effect is caused by a translating line or by a rotating area. Since light is locked inside a fiber the effect is distributed along a line, and no effect exists on the enclosed area. We can therefore conclude that the effect is from a translating line. The traditional interpretation of Sagnac effect (as rotational) is not correct and this error is caused by a confusion regarding behaviour of light and behaviour of equipment. This fact explains also why Sagnac effect has not got a simple and clear explanation for almost 100 years.

The fact that Sagnac effect is translational implies that a straight line of length  $L$  moving with speed  $v_L$  in its own direction (in relation to the ether) also produces the same Sagnac effect ( $\Delta t \approx Lv_L/c^2$ ) as earlier described for a circle. The correction for Sagnac effect in the global positioning system (GPS) is therefore a detection of translational ether-wind produced by the

rotation of our planet. This indication from GPS can be verified even more unambiguously by detecting translational effect from the rotation of our planet in a laboratory under very controlled conditions. A method for this is described in an article [2] by Dr C. C. Su and also in an article [3] by this author. The need for Sagnac corrections for our planet's rotation but not for its translation is an indication of an ether that is translated, but not rotated, by our planet. An ether with this behaviour regarding light is in agreement to the ether's behaviour regarding gravity. Entrained translation, without entrained rotation, was abolished by Einstein in 1918 by a reference [4] to potential theory applied to (nonexistent) ether. The ether's behaviour regarding gravity is also discussed in an article [1] in *Physics Essays* in December 2010.

The experiences from the GPS system support the idea of entrained (or dragged) ether. However these words may be misleading since the effect is not caused by mechanical friction. Instead the effect is generated by the presence of matter. This is the reason to the title "The Generated Ether" in an article [5] to *Natural Philosophy Alliance* in 2005.

### 7. The Ether-Wind

Stellar aberration, Airy's test, Sagnac effect and the experiments by Michelson and Morley are the four most important phenomena founding relativity. All four are interpreted in error. Three irrelevant tests have been accepted and one relevant test has been ignored. The alternative interpretations that are given here support entrained ether. This idea is also supported by the fact that planets move without demonstrating retardation by friction, but this fact is in conflict with the autonomous ether. Entrainment means that a possible friction is moved outside the planet and into the ether where adaptation between entrained and not entrained ether can be possible without friction due to superfluity. Gravity particles interact very little with matter and probably even less with each other. Together this implies very strong support in favour of the entrained ether.

The problems regarding ether-wind are related to the fact that the irrelevance of transverse ether-wind was unknown. However, there is also another reason and this is the so called synchronization problem, defined as the impossibility of synchronization of two separated clocks. Instead of solving this impossible problem it can be circumvented by involving many clocks and using feedback from signals in known positions. The feasibility of this idea is demonstrated in the global positioning system (GPS), since the system provides positioning by means of one-way signals. The time difference between clocks must be constant and the constant eliminated in the evaluation.

### 8. Gravity

Fatio and Le Sage's theory implies that matter can cause an asymmetry in the flow of particles resulting in a net flow of particles in direction towards a material body. This idea can mean a vertical and negative ether-wind producing gravity. Gravity is therefore a stationary condition regarding moving particles. This explains the fact that gravity does not demonstrate the kind of aberration seen in starlight. The wave model for gravity is in conflict with this fact. In explaining the lack of aberration in

gravity by the wave model absurdly high speed of propagation is demanded.

According to Fatio's pushing gravity we can conclude that the falling ether produces frictional forces inside large bodies. But gravity produces also spherical form in these bodies. This spherical symmetry means that these forces add up to zero, and planets can therefore move without retardation in entrained ether. This is not possible for autonomous ether, since this ether demands frictionless ether motion inside a planet, and this is in contrast to gravity.

The entrained ether demands adaptation between nearby and far away ethers with different states of motion. This can mean friction, but ether particles interact very little with matter and probably even less with each other. Friction less adaptation is therefore very plausible in the ether.

Ether particles must have some (small) mass since the ether can transmit forces. Therefore attenuation of the flow must produce some heat, and this is also observed in our sun and in our own planet.

Newton's gravity based on a finite number of mass points can be described instead by an integration of density over volume. By comparing this model to pushing gravity we find a very small difference. The concept gravitational shielding is missing in Newton's gravity, but since the attenuation in the flow of gravity particles is extremely small this is probably without practical significance. Therefore we find that Newton provides a *usable* approximation to Le Sage and Le Sage *explains* Newton.

## 9. The Speed of Atomic Clocks

The speed of atomic clocks is observed to depend on speed and gravitational potential. A vertical ether-wind as a cause of gravity means that the vertical ether-wind squared can be used instead of gravitational potential. We get one model instead of two. The problem with the atomic clocks will perhaps be addressed in a future article by this author.

## 10. Discussion

It is not possible to detect effect of transverse ether-wind since such effect does not exist as long as detection of wave front normal is done (in telescopes or interferometers). The wave motion of light depends on the ether-wind only regarding speed. Stellar aberration is an illusion. Airy's test is silent due to compensation.

It is not possible to detect second order effects of longitudinal ether-wind as long as a mechanical construction is used as a reference. The second order effect in two-way light exists in mechanical objects also and is therefore compensated. MMX is silent due to compensation.

It is not possible to refute the entrained ether by Doppler shift in microwave background radiation, since this effect can represent a speed in relation to very distant sources, not nearby ether.

It is not possible to refute the entrained ether by Marinov's experiments only. Although not disproved these results alone are not enough as evidence against the entrained ether. Marinov's results are in conflict with GPS experience and not retarded planetary motion.

It is possible to detect first order effect of longitudinal ether-wind although two separated clocks cannot be synchronized.

The synchronization problem can be circumvented by an increased number of clocks and (in GPS) feedback from receivers in known positions. The possibility of doing positioning based on one-way propagation (in GPS) supports this fact. The demand on clock error is constant instead of zero. Sagnac effect is translational and must be corrected for in coordinate transformations to avoid multiple times.

It is possible to explain light by Maxwell's wave model without Planck's quantization. Planck's quantization is caused by self organization in nature to produce symmetry in electron arrangement in order to minimize radiation from electrons. Planck's quantization concerns only structural energy inside the atom.

It is possible to unite Sagnac corrections in GPS with ether, translated, but not rotated, by our planet. But, autonomous ether cannot be united with planetary motions without retardation.

It is possible to explain gravity by Fatio's particle model without gravity waves. The lack of aberration in gravity supports Fatio's stationary condition, but demands unrealistic speed of propagation in a wave model. Fatio's model can be united with Newton's gravity by ignoring gravitational shielding. This approximation error is probably not detectable.

It is not possible to explain light bending near our sun by gravity if light is a wave without mass, but this bending can be explained by longitudinal component in ether-wind.

## 11. Conclusion

*The theory of relativity* is based on wrong interpretations of many phenomena, assumes many failures as evidence for impossibility, produces multiple time concepts, predicts enormous speed of gravity, assumes light to be both wave and particle and is therefore untenable.

*The autonomous ether* is refuted by the fact that no retardation is observed in the motion of planets, and also by the fact that the GPS system demands Sagnac corrections for the receiver's motion in relation to the centre of our planet but not in relation to our sun.

*The entrained ether* can explain all phenomena regarded in this article. However, from the GPS system it is concluded that entrainment concerns translational motion only and not rotation.

Testing of ideas presented here can easily be done by doing the test suggested by Dr. C. C. Su and described in [2] and in [3].

## References

- [1] J. E. Persson, "The empirical background behind relativity", *Physics Essays* **23**: 634 (2010).
- [2] C. C. Su 2, J. C. *Eur. Phys* **21**: 701-715 (2001), DOI 10.1007/s 100520 100759.
- [3] J. E. Persson, "To Measure the Rotation of the Earth", *Proceedings of the NPA* **7**: 363-364 (2010),.
- [4] A. Einstein, *Deutsche Physische Gesellschaft* **20**: 261 (67-68) (Nov 1918), English translation at <http://www.wbabin.net>, see "Physics" "E. Gehrcke".
- [5] J. E. Persson, "The Generated Ether", *Proceedings of the NPA* **2**: 136-137 (2005).