

Is the Ether Wind Decidable?

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Abstract

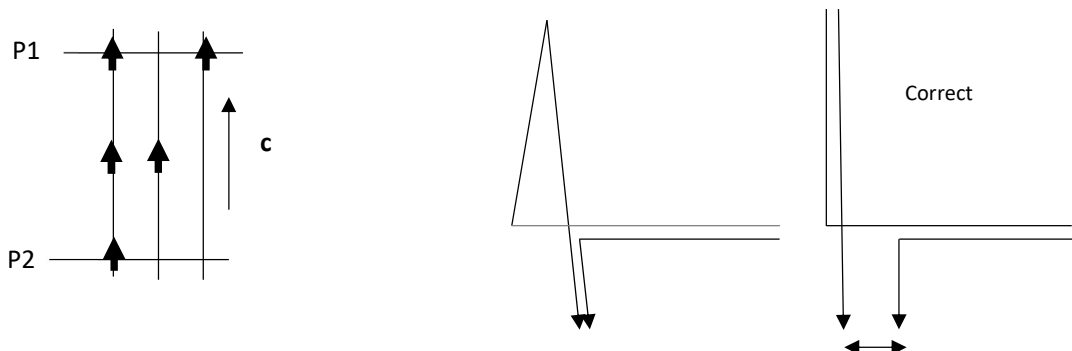
An illusion of undecidability of an ether wind was the basis for establishing the theory of special relativity (SRT). The reason to that mistake was a wrong interpretation of light behavior in both arms in the Michelson and Morley's tests (MMX), and also in the interpretation of stellar aberration. A deviation from the wave model gave us the illusion of particles in light, and also resulted in the absurd idea that the time concept is dilated, due to velocity.

MMX

The best way to find a numerical value on the speed of light, c , is to use 2-way light propagation. This fact caused the idea that 2-way light also should be used to detect **changes** in light speed, that are caused by the ether wind. This was a great mistake explaining why MMX tests have been done for 140 years, without fulfilling the predictions. The reason is multiple errors in the predictions for MMX. Wrong conceptions about the wave model has caused particle-based ideas to be mixed into the wave model. So, the transition from light particles to light waves is **not finished** and this means that we have not been able to unlearn particle thinking completely.

The MMX method is based on one measuring arm compared to an equal reference arm, that is oriented in a right angle to the measuring arm. An important error was introduced in 1882, by the statement that an effect of the ether wind also existed in the reference arm. This effect was stated to be half the effect in the measuring arm. The motivation for this was, that light must take a longer way, due to the transverse ether wind. This motivation is wrong and light behavior is **not** changed due to the ether wind inside the wave fronts and inside the distant mirror. The only effect of a transverse ether wind is that returned light hits the detector at a slightly changed position. This change is much smaller than the fringe size, and therefore **irrelevant**, since light hits the detector at an unchanged moment of time.

The first diagram demonstrates what happens in the reference arm. The behavior is unchanged in the ether's frame, but dependent on ether wind in equipment's frame. The left diagram demonstrates two different values on the ether wind. The right diagram is in the ether frame, and shows a small change in relation to detector, caused by equipment motion that is smaller than the fringe size, and irrelevant.



To realize that this is a correct interpretation we can regard the fact that the distant mirror produces a virtual image of the light source at the double distance. This image is **fixed in the equipment frame**, and therefore, orientation of returned wave fronts is also **fixed in the equipment frame**. Transverse ether wind is inside the wave fronts and cannot tilt wave fronts. The idea of tilting is wrong, and caused by **particle-based** thinking. Another way of illustrating this mistake is to regard the fact that mirrors are transparent to the ether wind, and reflect only wave motion. Therefore, in relation to a mirror we should describe light without regarding the ether wind inside the wave fronts. So, when we use the law of light reflection in a mirror, we should use the normal to the wave fronts and **not** the total light motion with transverse ether wind also included. Therefore, it is particle-based ideas that have fooled us to use the law of mirror-reflection in error. This mistake had the tragic effect that light appeared to contain particles and **the most fundamental paradox in physics** regarding waves or particles in light was created. The concept of time was corrupted by the introduction of **multiple time concepts**.

We conclude: no effect of ether wind in the reference arm, since wave front normal (not total motion) is relevant in relation to a mirror.

In the measuring arm, longitudinal to the ether wind, transverse electromagnetic forces in light are moving with **constant speed in relation to the ether**, in two directions. In a crystal longitudinal electromagnetic forces are moving with **constant speed in relation to the ether** to control atomic separations. This means that the ether wind reduces atomic separations to the same amount as the reduction in 2-way speed of light. Therefore, the assumed effect of ether wind is compensated by contraction of matter. This contraction is two times the presently accepted FitzGerald contraction.

We conclude: real, but compensated and **undecidable** effect of ether wind in the measuring arm.

Stellar aberration

The motion of the ether can move – but not rotate – a wave front. Tilting of a wave front is only possible due to a **gradient** in the ether wind. So, horizontal ether wind (in the order of one part in a million of light speed) cannot produce stellar aberration. Instead, the motion of our planet (about one part in ten thousand of light speed) can produce an **illusion** of wave front tilting, and thereby explain stellar aberration, since an unchanged wave front must have a changed representation in a moving frame. This follows from the fact that a wave front, unchanged in relation our sun must, has a changed orientation when described in the frame of our planet.

We conclude: no effect of ether wind behind stellar aberration.

Special relativity (SRT)

The ether wind is undecidable in both arms of the MMX equipment, as well as in stellar aberration. So, these tests are useless in relation to the ether wind, and SRT is based on these errors. SRT is therefore in error.

Sagnac effect

The Sagnac effect has not been accepted as an argument against SRT. This was motivated by a false statement that rotation is included. It is true that Sagnac effect can have a **mathematical** description by an integration of a rotation over an area. However, the description that has **physical** relevance contains instead an integration of a translation along a line. In Sagnac's tests this line was closed, due to a specific **demand from his method**, but this demand is not a general concept. So, a mathematical relation has been used as a physical. It is not difficult to see that the phenomenon is locked inside a fiber, and therefore distributed along a line.

The global positioning system (GPS)

The ether wind is not decidable by means of MMX or by stellar aberration. However, the ether wind is **decidable** by means of 1-way speed of light. The GPS system is measuring distances based on the 1-way speed of light. So, if the ether exists it must be united with the high precision in positioning that we see in GPS. Receivers in GPS are situated on the spherical surface of our planet, and the transmitters are on another, 4 times larger, sphere concentric to our planet. Therefore, GPS is a spherically symmetric system, and can therefore be united with a spherically symmetric ether wind. According to experiences from GPS an ether wind, translated but not rotated, by our planet can be united with GPS precision. However, such an ether wind cannot be united by common sense, since this would mean that our small planet would decide the ether wind in the Universe.

We conclude: a spherically symmetric ether wind is plausible.

Gravity

An important conclusion is that spherical symmetry can mean a unification between ether wind and force of gravity. Such a gravity model is in agreement to the 300-year-old model, suggested by Fatio. By assuming bodies in perfect spherical symmetry Fatio's and Newton's models become almost equal. The only difference is that Fatio – but not Newton – can explain the Allais effect. So, we can regard Newton's model as an **approximation** to Fatio's model. Fatio's model is more general, and does not demand spherical symmetry. So, mathematical idealization has fooled us to use an approximation as a reality. Newton knew Fatio and is said to have received Fatio's model, although he seems to have ignored it. Apparently, Newton was accepted just because he was more famous. The main difference between the two methods is, that instead of addition of mass points, a continuous integration is done of density over volume. So, by producing spherical symmetry gravity is hiding from us its essence.

We conclude: ether wind can explain gravity.

Atomic clocks

Without time dilation we need clocks themselves to be responsible for the clock behavior observed when atomic clocks are put into orbits in the GPS system. This is not difficult, since bound electrons move forth and back, in relation to the ether wind, in one dimension of two. So, an effect of the ether wind can cause clocks to change speed in about the same way as the 2-way speed of light, in the measuring arm of MMX. The only difference can be that this effect is not compensated in clocks as is the fact in MMX.

By assuming clock frequency as $f=f_0(1-v^2/2c^2)$ we can describe clock speed, as an effect of ether wind v . With v as the speed of a GPS satellite we can arrive at the same clock prediction as SRT. In vertical direction, we can use v equal to the escape velocity and arrive at the same prediction as GRT. So, ether wind alone can provide the same prediction as SRT and GRT provide **together**.

We conclude: ether wind can explain clock behavior and substitute the **absurd** idea of time dilation.

The wave model

To strict follow the wave model, means to regard the fact that mirrors are transparent to the ether wind. Therefore, it is the normal to the wave fronts (ray direction), that is controlled by mirrors and orthogonal to the distant mirror in MMX. This means that total motion (beam direction), as the vector sum of wave velocity and ether wind can deviate due to transverse ether wind. In horizontal direction this deviation can be caused by planetary rotation and always be less than 1.6 parts per million of c . In

vertical direction the ether wind, responsible for the force of gravity, is about 37 parts per million of c . So, the common statement that light moves transverse to wave fronts is not exactly true. The small difference between ray and beam can be ignored in most cases **but not in the interpretation of MMX**.

We have seen that a particle-based thinking caused transverse ether wind to appear to be able to alter a wave front, and cause an effect of ether wind in the reference arm in MMX. This mistake caused an illusion of particles in light and a wrong interpretation of MMX, leading to the ad hoc solution of introducing multiple time concepts. So, we can conclude that all particle-based ideas are not swept out, and we still have to do more unlearning regarding particles in light. Therefore, we find that **the transition from light particles to light waves is not finished**.

Decidable ether wind

Trial and error is an important tool in our daily life, and it is often a good idea to stop trying after some failures. Nevertheless, it is not correct to conclude that we have new knowledge (about undecidability) from a lot of failed predictions, as has been done from 140 years of tests with MMX. Therefore, it was a great mistake to conclude, not only state of motion, but also state of existence, from failures with MMX together with stellar aberration. Instead, the ether wind **is decidable** by 1-way light speed due to the GPS system.

The unjustified denial of the ether is also the main reason to the fact that we have not been able to explain gravity. By assuming an ether wind in radial direction to Earth we can explain the force of gravity as proportional to the ether wind squared if we assume this ether wind equal to the escape velocity. Such an ether wind gives the same predictions for atomic clocks as SRT and GRT produces **together**. We can also use this ether wind to explain Pioneer anomaly by a shift in 2-way speed of light.

All you need is wave for describing light as an ether behavior. However, the particle model seems to be needed for describing the ether, according to Fatio. A mathematical conflict between continuous and not continuous descriptions means that these two models cannot be united into one model. Therefore, we must use two models to describe reality. This is possible since, in relation to reality, we regard the models as approximations. A mathematical conflict is not necessarily a physical conflict and can perhaps be blamed on a limitation in our tools.

Conclusions

- The ether wind is **decidable**.
- The transition from light particles to light waves is **not finished**.
- In 1882 the wave model was infected by particle-based ideas, and light appeared to contain particles. The **wave or particles paradox** was created.
- Time dilation was an ad hoc idea to cover up for an error.
- An atomic clock-sensitivity to the ether wind can substitute time dilation.
- The FitzGerald contraction in matter should be doubled.
- The small difference between beam direction and ray direction has **not been regarded**. This has caused misunderstandings and caused several paradoxes.
- The denial of the ether is the main reason to the lack of explanations to gravity, and to the Pioneer anomaly.
- Newton's gravity is an approximation to Fatio's gravity.
- Fatio explains the Allais effect – Newton does not do that.
- The high precision of the GPS system is deeply dependent on spherical symmetry.

Summary

The transition from particle model for light to a wave model is not finished. The MMX tests have not been properly understood and paradoxes exist since 1882. SRT and GRT are therefore in error and the developments in physics have been delayed. This explains the present chaotic situation. A very serious crime was the introduction of multiple time concepts in physics. This fact was pointed out by Harald Nordenson in 1922 in a book in Swedish. He also concluded that '**SRT is not physics but a very bad philosophy**'. After studies in philosophy he wrote another book in English in 1969, with unchanged opinion. Nordenson also got very strong support from two Swedish philosophers, namely Phalén and Hågerström.

It was not observed that light moves with speed c , transverse to wave front, only in the ether frame. And therefore, this motion described in the equipment frame becomes: $\sqrt{c^2+v^2}$ for an ether wind inside wave fronts. So, we can also state (as done by Hartwig Thim) that Pythagoras theorem is used in a wrong way in MMX, reference frame.

The 1882 mistake gave us the wave or particle paradox as the most **fundamental paradox** in physics. Niels Bohr made a cover up by renaming 'paradox' with 'complementarity'. A correct interpretation of the behavior in the reference arm means, that we can give up the absurd idea of many time concepts. The FitzGerald contraction must be doubled, and combined with an ether wind dependency in atomic clocks. We can also explain gravity and Pioneer anomaly due to a radial ether wind equal to the escape velocity.

Remark

The criticism regarding RT has mainly emanated from philosophers. But scientists seem to have low respect for philosophers, and motivated that attitude by saying that philosophy has not contributed much to science. But the mission for philosophy is **not** mainly to produce new theories, but rather to be helpful in sorting out bad and inconsistent theories. That is just what Nordenson tried to do 98 years ago. He did what he could.

This author has a hope that, at least philosophers, will read this paper.

Reference

The links below contain information about Harald Nordenson.

<http://db.naturalphilosophy.org/member/?memberid=482>

<http://db.naturalphilosophy.org/member/?memberid=482&subpage=books>

Other articles from this author.

https://www.academia.edu/40720901/All_You_Need_Is_Wave_II

<https://fqxi.org/community/forum/topic/2962>