

# All You Need Is Wave, II

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## Abstract

This article describes physics without a lot of modern inventions like: quanta of light, wave-to-particle complementarity, dilation of time, bending of space and quantum jumping.

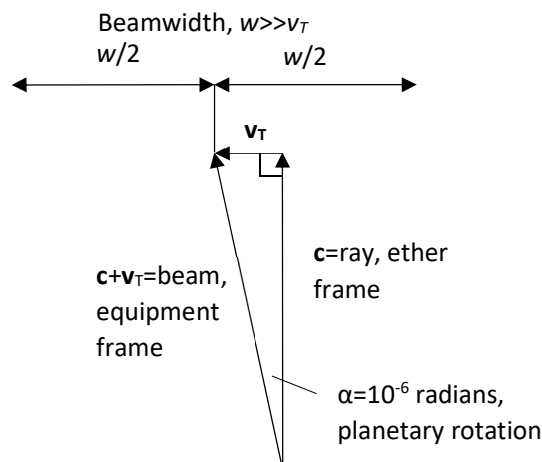
Included is instead some traditional concepts like: a strict wave model for light, contraction of matter (not of space), Galilean transform, explanation to gravity, explanation to the Pioneer anomaly and – most important – the ether.

Atomic clocks behavior has been modified in this second version.

## The transverse arm in Michelson-Morley's tests (MMX)

Reflectors and refractors are transparent to the ether wind,  $\mathbf{v}$ , but define instead boundary conditions, that are relevant in relation to the wave motion,  $\mathbf{c}$ . This follows from the fact that  $\mathbf{c}$  is a moving process, and  $\mathbf{v}$  is a stationary condition, with no dependency on the mirrors. Therefore, beam direction, or real and total motion,  $\mathbf{c}+\mathbf{v}$ , is not falling along the optical axis transverse to mirrors in MMX. Instead, the normal to the wave fronts, or  $\mathbf{c}$ , the ray direction is falling along the optical axis. Therefore, aligning the MMX equipment means that wave fronts are adjusted to be parallel to mirrors, and this fact is not changed when the equipment is rotated. So, in coherent systems we must observe that transverse ether wind (inside the wave fronts) cannot alter the propagation time, and not wave front orientation either. The irrelevance of transverse ether wind,  $\mathbf{v}_T$ , means that, in relation to a mirror, light can be

described as  $c(1+v_L/c)$ , with  $v_L$  as the longitudinal component in  $\mathbf{v}$ .



In the diagram we assume  $v_L=0$ , and regard only  $\mathbf{v}_T$ . We can see that, although we have to do a correction by  $\alpha$ , this fact does not change the propagation time. So, we find that an ether wind inside the wave fronts cannot tilt a wave front. Therefore, the ether wind causes no effect in the transverse arm of MMX, since the propagation time is not changed. The MMX equipment is not sensitive to where the returned light hits the detector (since fringes are large), but only sensitive to when the detector is reached. Since

the ether wind cannot tilt a wave front, we can see that stellar aberration is useless in relation to the ether wind. The state of motion of the observer, instead, creates an illusion of tilting.

We have seen that an ether wind inside the wave front cannot tilt the wave front. However, such an effect was suggested by Potier in 1882. Although Michelson protested, he was forced by majority to give up in 1887 – after a nervous breakdown. This was devastating for physics and the wave model was disturbed by particle-based thinking. So, the wave or particle paradox was produced and this also caused the twin paradox. To cover up for this error time dilation was invented.

This means that the bad state of physics today was caused by ignorance of the fact that mirrors are blind to the ether wind, and the factor  $\gamma^{-1}=(1-\beta^2)^{1/2}$  ( $\beta$  is  $v^2/c^2$ ) is just an illusion. So, we can conclude that the transition from Newton's particles to Maxwell's waves is not yet finished. The wave or particle paradox has consequences for the theory of relativity, as well as for quantum physics.

## The longitudinal arm of MMX

We regard light as a periodic and potential force moving with the speed  $c$ , in relation to the ether. The force must be potential until the force hits an electron, and thereby creates a force on the electron. This is needed to avoid action at a distance, without consumption of time, since thermal radiation must move from many generating electrons to one detecting electron. So, light is a potential force from many moving electrons. So, light transports information needed if another electron is hit by the light.

The atoms can also generate potential forces, but these forces are not periodic, but takes the value zero at some distance. Therefore, these forces can define separation between atoms in a crystal. These forces also move with the speed  $c$  in relation to the ether.

Now we have two forces moving with the speed  $c+v$  in relation to matter. As usual we find the two-way speed of light by inverting, adding and inverting back. In almost the same way we can find atomic separation by inverting, averaging and inverting back. The only difference is that we now take an average value instead of a sum. The reason to this is that light moves sequentially between mirrors, but the force defining separation moves simultaneously between atoms. But the average value is just the half of the sum. So, in both cases we get  $1-\beta^2$  with  $\beta$  as  $v/c$ . This means that the effect searched in MMX is real but compensated in the longitudinal arm. This contraction is 2 times the FitzGerald contraction.

## MMX

No effect in the transverse arm, and compensated effect in the longitudinal arm, means that MMX is a useless method in relation to the ether wind. Unfortunately, MMX has contributed in the negative direction to theoretical physics, by false interpretations of light behavior in both arms of the equipment. These mistakes created the illusion of time dilation. So, physics went fundamentally wrong in 1887 – not in 1905 – and the wave model was infected by particle ideas. This infection also contributed to the invention of the wave and particle complementarity, and this was just a wishful thinking about a symmetry between waves and particles, that does not exist.

## Electrons

Perhaps electrons can be regarded as just particles although they can produce effects in the ether. So, we should ask: is the wave function for the electron just a description of what the electron does to the ether? However, this question will not be further addressed here.

## Atomic clocks

Bound electrons in atomic clocks move forth and back in relation to the ether wind, just as light does in MMX. Therefore, the speed of the electron changes during each orbit. So, these fluctuations can cause a second order effect of the ether wind in the frequency of atomic clocks comparable to the change in of 2-way light speed and length of matter that was found in MMX. We therefore find that a second order effect that was real but compensated in MMX can be real and not compensated in atomic clocks. We have therefore found an effect of the ether wind that explains, with a mechanism, the same prediction as is given by SRT. However, SRT has not a mechanism.

In order to substitute also the predictions by GRT we can assume an ether wind in radial direction to Earth. We assume the magnitude of this ether wind to be equal to  $\sqrt{2}$  times the tangential ether wind used to substitute SRT, that is relevant for a satellite in a circular orbit. We can easily calculate this effect and find the same result as GRT. So, we can conclude that the effect of SRT plus GRT can be explained by only one model due to the ether wind.

This radial ether wind can also be united with the high precision in the global positioning system (GPS). We can see this by regarding the fact that all receivers are located at a spherical surface, and all transmitters are on another sphere, concentric to the first one. The GPS results indicate a functionality 'as if' the ether is represented by a frame with the same state of motion as the center of Earth. However, we cannot assume our own planet to entrain the ether in the whole universe. So, we must assume the ether wind with spherical symmetry. This is in agreement to the spherical symmetry in GPS. This ether wind is also demanded by the fact that gravity must be explained.

These results can easily be calculated. In the earlier version of this article there was used a clock frequency proportional to  $1-\beta^2\cos^2(\alpha)$ , with  $\alpha$  as angle between ether wind and the plane of the electron's orbit. However, tests done by Ronald C Ward at [rward0@aol.com](mailto:rward0@aol.com) seems to indicate independency of clock orientation. Therefore, we must instead assume clock frequency proportional to  $1-\beta^2/2$ . This means that we need to increase the assumption regarding radial ether wind by  $\sqrt{2}$  to find the same results as SRT and GRT.

## The ether

In an earlier discussion we found that, to avoid action at a distance without time consumption, we must assume light to be a potential force. So, realization after some time delay demands energy from the ether, and this means also a support for the idea that the ether must be real. Therefore, thermal radiation can be without energy and instead contain information needed to gain energy from the ether. This means also that bound electrons can generate thermal radiation continuously without losing kinetic energy. Therefore, thermal radiation can be explained without quantization of radiation. The observed results can instead be explained by the fact that quantized electrons are used as detectors. So, Planck's constant can be an electron property instead, and photons are not needed to explain the effects that electrons and atoms produce on the ether, called thermal radiation.

Ether waves can also affect electrons. So, we have an effect in opposite direction to earlier. We call this effect photoelectric effect. We can explain this effect by assuming electrons with suitable kinetic energy to be affected by light due to an interference phenomenon. Such an interference effect can cause a force on the electron transverse to motion and change potential energy just enough to excite the electron. So, we do not need the photon model here.

In about the same way an X-ray wave packet can (by interference), cause an electron to escape its atom. This can explain the first step in the process called Compton effect. In the next step the process goes in opposite direction and generates a secondary X-ray packet, when the electron is captured by another atom. So, we do not need photons here.

Two identical photodetectors can (by the use of a beam splitter) be exposed to the same amount of continuous laser radiation. Equal amounts of electrons are produced in the two detectors. However, the output signals are not correlated, since electrons behave independently of each other. If we instead have two beam splitters, we can use a Mach-Zehnder interferometer to very clearly show that light is waves – not particles.

## No quantum jumping

We have seen that regarding thermal radiation as a potential force, allows radiation from electrons to be continuous and without consumption of energy. However, all atoms in the same energy state are in a wireless communication at the same wavelength. This fact allows all atoms in the same state to radiate and self-organize to produce a total effect of zero due to destructive superposition. However, non-linear effects can also produce interferences at frequencies equal to the difference between the primary frequencies. Between these interference products, superposition is not likely to work. Therefore, we can see interferences, but not the primary frequencies. This means that quantum jumping can be an illusion, that is produced by interference effects.

## The Pioneer anomaly

The assumption made regarding the magnitude of the radial ether wind gives the value 9.3 km/s at 20 AU (astronomical units) from the Sun. The effect on 2-way light speed becomes  $-0.7 \cdot 10^{-9}$  and  $1.4 \cdot 10^{-9}$  on carrier frequency. This gives  $1.4 \cdot 10^{-9}(1-20/70)=10^{-9}$  as the shift in carrier frequency between 20 and 70 AU for 2-way communication. This appears to explain the Pioneer anomaly.

## Gravity

An ether wind blowing in radial direction to our planet can explain gravity. This idea is in agreement to the 300-year-old ether model presented by Fatio. He assumed very small and very fast particles to move in all directions. He also assumed that this flow is slightly reduced, when passing through a large celestial body, like Earth. This means that the flow away from the body is smaller than the arriving flow, and an asymmetry is produced. This asymmetry is the gravity, and this means that a small body is forced towards the large body. This model works also for bodies of the same size.

When we regard bodies with spherical symmetry, in form and density function, Fatio's gravity becomes equal to Newton's. However, Fatio's model is more general, and Newton's model is an approximation to Fatio's by means of a central mass point. Without this approximation we must do an integration over volume. Another advantage for Fatio's model is that he explains 'why', and Newton only says 'how'. It has been stated that Fatio sent his model to Newton, which is plausible, since they knew each other. So, it seems very unhappy to science that Newton seems to have disregarded Fatio's idea. Perhaps Newton wanted all the honor, and perhaps this explains why he said: 'I state no hypothesis'.

A spherically symmetric ether wind is therefore demanded by the high precision in the spherically symmetric GPS system, as well as for the necessity to produce gravity.

## Gravity anomaly I

Allais has observed changes in the behavior of a pendulum during solar eclipses. A suggested explanation is a small reduction of gravity due to gravitational shielding. The effect can very roughly be estimated to be in the order of  $10^{-9}$ , in relation to gravity on Earth. A couple of years ago attempts were done in USA to detect this effect in a high elevation angle solar eclipse. No indication was found, and the reason can be that the effect can be real, but not affecting gravity on Earth. The principle of equivalence can explain this by converting gravity to motion. This means that some parts of our planet are accelerated away from the Sun-plus-Moon system, and gravity on Earth is not changed. This motion can very roughly be estimated to be in the order of 1 m. This effect is caused by a gravitational shadow, the size of the Moon, penetrating our planet. Fatio's model explains this better than Newton's. It is not easy to detect this small effect, since we have no reference. However, a more indirect indication of this effect exists in the facts that the distances Earth-Moon and Earth-Sun increase with a few cm/year.

A gravimeter is not the right tool for detection of this motion. Instead we should use a long pendulum at rest. The motion of Earth in a point can be somewhat affected by averaging over a larger part of our planet, but the value in the pendulum's mass is instead a real point value. So, perhaps we can detect this asymmetry as representing a small part of the real motion. The chances are best at low elevation angles, and also just outside the eclipse where we find a gradient in this motion.

Observations supporting this idea have been done in the motions in a high radio tower in Hungaria (in low elevation angle). Observations have also been done in Mohe in China (low elevation).

## Gravity anomaly II

A different kind of anomaly has been observed on satellites in high orbits, far away from Earth. The constant of gravity,  $G$ , appears to decrease at longer ranges. This is indicated by longer period times in relation to the radius of orbit. But this phenomenon may have another interpretation due to influences from gravity caused by Sun and Moon, being more important far away from Earth. The speed of the satellites can be changed during each orbit, and this can produce a second order effect on the period times.

## Summary

- The tests that were done by Michelson and Morley have been interpreted in a wrong way, in both arms, and this has caused devastating errors in physics. The result of these errors is the invention of dilation of time, and also the production the wave-or-particle paradox, that therefore was renamed to wave-or-particle complementarity. So, we can give up the Lorentz transform.
- Stellar aberration reveals observer motion – not ether wind.
- Accepting the concept ether means that light can be described as waves only, and particles are needed only for the description of the ether. Therefore, we can regard Planck's constant as an electron property.
- By regarding the forces in light as potential, we can explain thermal radiation as continuous, and demanding energy from the ether – and not from the electron. So, the ether is demanded again – and also described on T-shirts.
- The hydrogen spectrum can be explained by interference products from invisible – but real – radiation from ground states. So, we do not need to assume quantum jumping.
- Gravity can be explained by a spherically symmetric ether wind, that also is in agreement to the high precision in the spherically symmetric global positioning system. The cause of gravity can be explained by Fatio's ether model.
- Gravity anomalies during solar eclipses, and in satellites in high orbits, can be explained.
- The Pioneer anomaly can be explained.

## References

The ideas presented here are also discussed in earlier papers. They can be found on following sites:

<https://www.gsjournal.net/Science-Journals-Papers/Author/763/John-Erik,%20Persson>

<https://independent.academia.edu/JohnErikPersson>

[https://www.researchgate.net/profile/John\\_Erik\\_Persson/publications](https://www.researchgate.net/profile/John_Erik_Persson/publications)

## Remark

In an article called *Unsinkable Ether and Unthinkable Photon* a very rough estimation regarding light bending near the Sun was done. The multiplication by  $\sqrt{2}$  does not destroy this rough estimate.