Physics without Paradoxes

John-Erik Persson

Budkavlevaegen 5, 14174 Segeltorp, SWEDEN, john.erik.persson@gmail.com

The number of paradoxes in theoretical physics is large. This means that we have reason to suspect that experiments have been interpreted in error long time ago. The behavior of light and ether has been misunderstood. This has caused wrong interpretations of stellar aberration, Michelson and Morley's tests and of Einstein's so called light clock. If we instead regard Sagnac effect, global positioning system (GPS), Pioneer anomaly, gravitational anomalies during solar eclipses and the behavior of atomic clocks, than we get a very different view of light and ether. We find that we do not need the theory of relativity, and not the quanta of light either. We also find that we can explain gravity. The paradoxes disappear.

Keywords: light, relativity, stellar aberration, ether, gravity, quantization.

1. Maxwell's ether model

Maxwell described an ether by four important equations. It is a remarkable fact that this description survived, but the described object did not. The ether was abolished due to a young patent engineer, who later, after lifelong studies in physics, tried to correct his mistake. A general solution to Maxwell's description is found in the wave equation. This equation indicates that light is a process in the ether, propagating with a constant and universal speed c in relation to this ether. In order to find a particular solution we can add a constant of integration $\mathbf{v}(\mathbf{r})$ that is constant in relation to time. Although $\mathbf{c}$ is universal $\mathbf{v}(\mathbf{r})$ can nevertheless be local. $\mathbf{v}(\mathbf{r})$ can be identified as the state of motion of the ether, or the ether wind. This means that we get light speed as $\mathbf{c}+\mathbf{v}(\mathbf{r})$ in relation to an observer. Vector addition must be allowed, although these two concepts are very different physical objects. Therefore we find that light propagates as below.

$$\mathbf{c}t + \int \mathbf{v}(\mathbf{r})dt$$

The global positioning system (GPS) can help us to find information about $\mathbf{v}(\mathbf{r})$. By regarding the Sagnac correction used in the GPS system we can conclude that GPS delivers positions and speeds in relation to the center of our planet. Therefore, we can conclude that an ether wind $\mathbf{v}(\mathbf{r})$ equal to the motion of the center of our planet can be united with the good functionality in GPS. However, an ether wind entrained by our planet in the whole Universe is not in agreement to common sense. Far away from our planet zero influence would be more reasonable. This problem can be solved if we regard the fact that all GPS receivers are near the planet's surface and all transmitters are on the same distance from our planet. This means that we can suspect that an ether wind $\mathbf{v}(\mathbf{r})$ with spherical symmetry is the explanation to the high precision in the GPS system. An ether wind of this kind is interesting from another viewpoint as well, since such an ether wind can **explain gravity** in good agreement to a model described by Le Sage long time ago.

2. The wave motion of light

If we want to detect the **real** motion of light as described earlier we must detect by amplitude and use light focused into a narrow beam. In this case the vector sum is relevant. However, if we instead detect light by phase and see the normal to the wave fronts only **wave** motion is relevant. The reason is that without any modulation on the amplitude of light ether wind inside the plane of the wave front is not observable. Transverse ether wind $u(\mathbf{r})$ (blowing inside the wave front) becomes irrelevant when detection is by means of phase. In this case only $\mathbf{c}$ and $w(\mathbf{r})$ are relevant. ($w(\mathbf{r})$ is component in $\mathbf{v}(\mathbf{r})$ parallel to $\mathbf{c}$). Therefore if we detect by phase (for instance in a telescope) relevant description of light becomes as follows.

$$\mathbf{c}t + \frac{\mathbf{c}}{c} \int w(\mathbf{r})dt$$

The fact that transverse component in ether wind becomes irrelevant in telescopes means that stellar aberration cannot tell us anything about the ether wind. The only thing that we can conclude from observations on stellar aberration is changes in the state of motion of the telescope. Therefore, the early interpretation of stellar aberration based on light particles is valid for light waves as well. The fact that we observe based on phase in a telescope and detect wave front orientation means that light apparently behaves like particles. The finite time between focusing and detection in the telescope means that apparent wave front orientation depends on the state of motion of the telescope.

Another consequence of the irrelevance of transverse ether wind is that transverse ether wind cannot change orientation of a wave front. Instead wave front bending is caused by a gradient in the longitudinal ether wind $w(\mathbf{r})$. In optical resonators and interferometers standing waves are generated by optical feedback and based on phase. Therefore, plane waves are generated and these wave fronts are always parallel to defining mirrors. Therefore, small motions of mirrors inside the planes of these mirrors cannot change the behavior of light. Light motion depends only on ether wind and mirror orientation. It was therefore a mistake to use spherical wave fronts to derive an effect of transverse ether wind in Michelson and Morley's tests (MMX). The same mistake was repeated in a so called light clock. We can also explain the irrelevance of transverse ether wind by realizing that light takes the fastest, and not the shortest, way between two mirrors. In cavities, interferometers and light clocks light always moves with the speed c in relation to the ether in a an angle transverse to mirrors. Moving the mirrors inside their own planes is irrelevant.

3. Michelson and Morley's tests

These tests, often referred to as MMX, have been assumed to be able to detect extremely small changes in the 2-way speed of light. MMX is based on a 2-way flow of information between 2 mirrors. However, the separation between the mirrors depends on the length of physical objects in the test equipment. This length depends on the separation of atoms in a solid body. This atomic separation is controlled by means of the ether, since the ether is all there is. A 2-way transmission of information is controlling this separation. Therefore, we have reason to suspect that a second order effect due to 2-way information flow can reduce atomic spacing in the same way as the reduction of the 2-way speed of light. The effect searched in MMX can therefore be compensated by a contraction of physical bodies. MMX can be useless.

Another problem with MMX is the assumption that planetary motion is assumed to be detectable. If this were true it should be reasonable to assume detection of even higher galactic motions. A possible explanation why we cannot see planetary motion is that this motion can be hidden by a wave function representing a matter wave. The curious behavior of Celtic stones (rattle-backs) can perhaps support this idea. We can assume that the wave function can be maintained without consumption of energy. If energy is needed to change the wave function we can explain inertia.

Experiments have been done with atomic clocks, flying in 2 opposite directions around our planet and compared to stationary clocks. The observed changes in clock speed seems to indicate that motion in relation to the center of our planet is more relevant than the motions the plane have relative to each other, as stated by the theory of relativity. The same thing is indicated in GPS. The Sagnac correction used in GPS indicates that GPS delivers position and speed in relation to the center of our planet. Therefore, we have support for the earlier mentioned idea of an ether wind in radial direction. This would mean that available ether wind in horizontal direction is only max 0.47 km/s (at the Equator). MMX cannot detect that and is therefore a useless method.

4. Detecting effects of the ether wind

Physics of today is based on observations of stellar aberration and results from MMX. The interpretations given here indicate that both tests are useless in relation to the ether wind. Instead we have observations of first order effects in Sagnac's tests, Sagnac correction in GPS and experiments by Rayong Wang[1] with measurement regarding speed with the ether as the only reference.

We have also observed effects of second order changing the 2-way speed of light with distance to the Sun and thereby causing the Pioneer[2] anomaly. There is also a second order effect on bound electrons in atomic clocks. This is caused by the fact that electrons move forth and back in relation to the ether wind. The electrons are therefore accelerated and decelerated during each period of orbiting. We can also explain a bending of light near our sun to be caused by a gradient in the longitudinal component of the ether wind. This is based on an assumed radial ether wind blowing in direction towards the Sun.

These effects have been calculated based on a simple assumption of a radial ether wind equal to the speed of a satellite at the same altitude as the ether wind. The GPS clocks were assumed to be oriented in a direction orthogonal to the direction towards Earth. The clocks were assumed to be not stabilized in direction of motion, resulting in a reduction of this effect by half, found as an average of a squared cosine function. The bending of light near our sun was not calculated in detail, but a very rough estimation indicated agreement to observations. (An indication to how a more precise calculation could be done, is given.) These estimations are available in articles under my name at GSJournal[3][4].

5. Further testing

We can easily test the ideas presented here. The easiest test is to change the orientation of an atomic clock from horizontal to vertical. The sensitivity due to potential of gravity (or vertical ether wind) should than be observed to be unchanged (or to disappear).

We can also do a test suggested by C C Su[5] as a scaled down version of de Witte's test. Two HeNe lasers with very high frequency stability should be connected over a few meters by means of an optical cable and connected to an interferometer. The equipment should be mounted on very advanced platform allowing for

measurements in changing elevation and azimuth.

6. Instead of SRT

The interpretations presented here indicate that we do not need the absurd ideas in SRT (the theory of special relativity). It is more realistic to assume the ether wind to affect the frequency generated in an atomic clock than to assume a mysterious elasticity in time **itself**. We can explain such a clock behavior very reasonably by realizing that bound electrons move towards and along the ether wind. They are therefore changing speed during each period of orbiting and this situation is very like the situation in MMX, without the compensating effect.

Without time dilation we do not need contraction of space either. Instead we can assume 2 times as big contraction of physical objects. This interpretation implies that Michelson's optical meter standard depends on the ether wind to the same extent as the older mechanical standard in Paris.

7. Gravity

We do not have to describe gravity as the bending of nothing, since we have alternatives to GRT (the general theory of relativity). Fatio described a much better model long time ago, and his model was further developed by Le Sage. This model assumes extremely small particles to move with extremely high speeds in all directions. Matter causes a small attenuation in this flow and this produces a shadowing effect. The spherical symmetry in the flow is thereby disturbed and this causes gravity. This model is often called pushing gravity.

An argument against Le Sage's model has been the fact that no aberration exists in the force of gravity from our sun. However, the force of gravity is caused by a **constant** relation between moving particles. Since this relation is independent of time no aberration can be caused. Therefore, the speed of constant gravity is zero although ether particles move in **all** directions with the speed c.

The equivalence between gravity and acceleration means that we normally cannot observe gravity from other celestial bodies, except our own planet. since our planet is in a free fall. However, there is an exception to this rule during a solar eclipse. The reason is that the gravitational effect of Sun and Moon together is not the same all over our planet during an eclipse. The point mass approximation for gravity is no longer valid. Therefore, the combined effect of Sun and Moon on a free mass can be different from the effect on our planet in the same point. In the first case we have a simple point value, but in the second case we have a more complex effect, since large parts of our planet interacts with each other. We can therefore expect a small difference between these two values. We therefore get a bipolar effect with values before and after the eclipse that are of opposite sign in relation to the value in the middle.

Anomalies during a solar eclipse in China have been reported by Quian-Shen Wang[6]. An effect in vertical direction was observed in a very sensitive gravimeter. Effect in horizontal direction was observed in Hungaria, and reported by Janos Rohan[7]. These observations were done on the motions of a very high radio tower.

8. Photoelectric effect

A particle of light hitting a slow electron cannot cause the electron to move in the direction from where the light particle was coming. However, a light wave can make interference with a **fast** bound electron and change potential energy in the electron. Light can do that by introducing a force on the electron in a direction transverse to motion. An interference effect between a wave and a bound electron can explain the photoelectric effect. The wave or particle confusion can be explained without the need for the particle model for light.

If light was constituted by particles with mass we should expect the white surface in Crooke's radiometer to catch about 2 times as much momentum as the black surface. The white surface would therefore move away from the light source. Instead, if light is waves causing a photoelectric effect, than we find that absorption in the black surface produces photo electrons and the recoil from them is the cause of the effect in Crooke's radiometer. Therefore, the black surface moves away from the light source. If we interpret Crooke's test as a manifestation of the photoelectric effect, than we find that the radiometer behaves as expected. The inventor himself could not provide a logical explanation.

9. Compton effect

An X-ray wave packet can cause an increase in the potential energy in the electron, in the same way as we have seen in the photoelectric effect. An electron can thereby escape its kernel. If this electron is captured by another atom an X-ray wave packet can be generated in a process that is reverse in relation to the earlier process, and the new frequency can be somewhat lower than in the first process, if kinetic energy is lost. The later process is equal to how X-rays normally are produced in cathode ray tubes. The Compton effect can therefore be described by 2 processes: the electron is first escaping and later captured by another atom.

10. Light without energy

The photoelectric effect and the Compton effect demonstrate that electromagnetic radiation can, by interference, cause an increase in the potential energy in an electron. The Compton effect demonstrates also that a decrease in the electron's potential energy is related to production of radiation. Therefore absorption (emission) of radiation is related to increase (decrease) of potential energy in a bound electron. This can be an effect of in-

terference. We usually assume electrons to interchange kinetic energy with electromagnetic radiation. However, this interpretation can be wrong and the electron can instead interchange **potential** energy with the **ether**. Since light in motion is not visible we have no possibility to see if energy is contained in light or if the interchange is with the ether instead. If the interchange is with the ether we should regard light to be a tool that is needed as an inter-mediator between electron and ether.

Two light waves of opposite phase and equal strength can produce darkness. Superposition of light waves can be destructive and this property proves that light contains no energy. This follows from the important law of energy conservation. No energy in light means that the electron must interchange energy with the ether. Instead light is an inter-mediating tool.

11. Black-body radiation

Since we regard electromagnetic radiation to be a link between ether and **potential** electron energy the kinetic energy is regarded as changed very little. The average potential energy of the electrons is therefore dependent on a balance between absorption and emission. The important constant h, named after Planck is related to interchange between charge and ether. Therefore, h can not be a property of light, but instead an ether property or an electron property. Since we cannot see the light we observe absorption by looking at electrons in a photo current. We use the electrons as our detectors. We detect by means of discrete charges. Therefore the only quantization indicated by h is quantization of charge. Quanta of light is only an illusion.

12. Summary

The so called modern physics is today about 100 years old. During these years technology has had an enormously fast progress, but basic physics has developed very slow. It is therefore time now for physicists to forget old misunderstood experiences like stellar aberration and MMX. Scientists should instead regard experiences from space technology like the Pioneer anomaly, satellite navigation systems, atomic clocks and from gravitational anomalies. Most progress in physics is due to finding (the always existing) anomalies. Lots of energy is spent on the impossible mission to prove beliefs. All we can prove by logic is the internal consistency of our theories. In relation to reality the theories are nevertheless approximations since there is always more knowledge to find. In relation to reality we can test empirically, but not with logic.

Maxwell's equations have very high status due to our fascination for mathematics, but it is sad that we have forgotten the ether physics that they describe. Maxwell was not complete regarding the ether wind and his giant step forwards also caused a step backwards, since the small difference between real motion of light and appar-

ent motion relevant in a telescope was not discovered. Bradley's correct interpretation of stellar aberration was therefore changed in error. Lacking a physical explanation to gravity we went to geometry. Michelson was also a very great experimental physicist who gave us a new definition of length, but he became more famous for his MMX failure than for his successes. He assumed an ether wind about 4 magnitudes smaller than light-speed, but if this were true we should also observe about 3 orders smaller than light speed due to galactic motion. Instead it is assumed here that in horizontal direction the ether wind is as small as 6 orders of magnitude smaller than light speed and about 5 orders smaller than light speed in vertical direction. Michelson still believed in an ether, although his results was misused to abolish the ether.

Peoples in general are better at inventing theories and mathematics than to be critical and discover and explain anomalies. The Vikings could not discover the science behind thunder and invented a science fiction hero they called Thor. Scientists of today can not accept black holes in their knowledge and invent black holes in the Universe. When they reach a dead end they invent wormholes to escape. They are always better on inventions than on discoveries.

The focus of this article is not primarily to invent a new theory, but instead to discuss as many anomalies as possible. It is a hope that the reader also will focus on anomalies. This is important since today we lack official explanations to eclipse effects on gravity, Crooke's radiometer and destructive superposition in light. Nevertheless the central idea presented here regarding a vertical ether wind can very easily be tested. All we have to do is to change orientation of a ground based atomic clock from horizontal to vertical and observe if clock speed is changed or not. This result decides if clock behavior is due to gravity potential or due to vertical ether wind.

We should not forget what Richard Feynman said: *We try to prove ourselves wrong as fast as possible, since only then can we find progress*. Therefore, it is the anomalies that can help us to find these errors.

REFERENCES

1. R. Wang, *Galilean Electrodynamics* **16, 23 March** (2005).
2. J.-E. Persson, Pioneer anomaly and the ether wind (2013), URL www.gsjournal.net/Science-Journals-Papers/763/John-Erik,%20Persson.
3. J.-E. Persson, The falling ether (2013), URL www.gsjournal.net/Science-Journals-Papers/Author/763/John-Erik,%20Persson.
4. J.-E. Persson, Light without energy (2014), URL www.gsjournal.net/Science-Journals-Papers/Author/763/John-Erik,%20Persson.
5. C. C. Su, *Eur. Phys 21* (2001).
6. Q.-S. Wang, *Physical Review D* **62** (2000).
7. J. Rohan (1961), URL http://astrojan.zz.mu/laki.htm.