

Fundamental Errors in Physics

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Abstract

This article demonstrates, how theoretical physics of today depends on more than 100 years old assumptions and interpretations of experiments, that are made in error. With the very advanced technology of today we have tools to correct these mistakes. It is demonstrated that the global positioning system (GPS), its atomic clocks, and advanced measurement systems in the space program can give us the means to reconsider old ideas.

This article illustrates the need for more critical thinking to reveal old fundamental errors.

An ether that is falling towards our planet is suggested, and it is demonstrated, that this ether model can explain more observations than existing physics. Gravitational anomalies, gravitation itself and Pioneer anomaly are explained by this theory. An explanation to destructive superposition in light is also given.

Background

The situation in modern physics is problematic, and full of paradoxes. Two light waves can add up to zero energy. Two persons born at the same time can be of different age. Electrons must be jumping in order to produce thermal radiation. Unexplained gravity and anomalies in gravity during solar eclipses are not explained. Pioneer anomaly and fly-by anomalies are very small, but can nevertheless be important too, since we have very advanced technology today.

Theoretical physics has developed very slow, in sharp contrast to the enormous developments in technology. Therefore, this fact can be regarded as an indication, that we humans are good as inventors, but bad as discoverers.

Destructive superposition in light

Addition of two light waves, of the same frequency and energy, does not follow the simple rule saying that $1+1=2$. The result can, instead of 2, be an energy between 0 and 4, dependent on the phase relation between the two waves. This demonstrates an important weakness in modern physics, and it is of great interest that we can solve this dilemma. A suggestion to solve this problem is to consider light to be empty of energy. Instead of transferring energy with light, it is here assumed, that light contains the information needed, to pick up energy from the ether. This information can consist of an asymmetry in the ether, perhaps in the form of polarization (or spin). This means, that light contains potential forces that later become real, when a charge is exposed to this radiation. Therefore, energy from the electron is not needed for generation of light. This energy may come from the ether instead. So, a potential force moves from the generating charge with the speed c , and after some time hits another charge and, in that moment, the force becomes real. This needed time delay proves that the necessary energy is provided by the ether. Therefore, we do not need quantum jumping, to explain how bound electrons can generate thermal radiation, without losing speed. They contain no energy.

Blackbody radiation

Light without energy seems to indicate that thermal vibrations are related to potential energies, rather than to kinetic energies, in electrons. Mechanical motions change separations between particles, and thereby also potential energies. Planck said that he acted in despair when he introduced quantum jumping. Perhaps he acted in error too, and we do not need quanta of energy.

Detection of light is done by using electrons as detectors, in a photo current. Quantized charge in our detectors can create an illusion of quantization in light. The product hf can represent quantization in the detector and h can be an electron property, and a constant of proportionality. We must also remember that f is a wave property, and hf therefore cannot prove light to be particles.

Photoelectric effect

It is observed, in the experiments called photoelectric effect, and Compton effect, that most emitted electrons move in a directions transverse to light. Therefore, light appears to affect those electrons that are orbiting inside the plane of the wave fronts of light. This indicates that light is a wave rather than a particle, and this wave seems to generate forces on the electrons transverse to electron motion. Since electron orbits are stabilized by a balance of two forces transverse to motion it is reasonable to assume, that another transverse force can disturb this balance. Therefore, a wave and particle interference can change potential energy in the electron. The electron can escape, if its kinetic energy is high enough. Interference is with tightly bound electrons. The wave model for light explains the photoelectric effect best. The hypothesis of light quanta is not needed.

Compton effect

The wave model for light gives also the best explanation to the Compton effect, provided that we regard Compton effect to be a result of two processes. In the first step an X-ray wave packet (not a particle) causes a tightly bound electron to escape. This is analogous to what happens in the photoelectric effect. In the second step this electron is captured by another atom, whereby a new wave packet is generated, in the same way as X-rays normally are generated. The second wave packet can have a different frequency, since the two processes take place in different atoms. So, we see that the second process is the reverse of the first process and equal to how X-rays normally are produced. The frequency shift proves the idea of two processes.

The wave or particle confusion

Sometimes light apparently behaves as particles. The assumption of light without energy indicates that this can be an illusion. The real reason can be simply that we use electrons, with quantized charges, as our detectors. Planck's constant can indicate quanta of charge, in our detectors. So, we have no evidence for quantization in light related to Planck's constant. We do not need quanta of light. Light is waves, ether is particles. Did Planck miss the fact that he used a quantizing detector?

Confusions regarding stellar aberration

In connection with the particle model for light, stellar aberration was explained by the so-called rain drop effect. When the same track of a moving particle is represented, in two different frames, the track must be adjusted according to the difference in the motions of the two frames. This fact is a relation between velocities, that does not change when we go from light particles to light waves. The only difference is that in the last case it is the orientation of a wave front, instead of the orientation of a track, that must be changed. The description must change in order to conserve reality, in relation to another reference. Therefore, stellar aberration cannot tell us anything about the ether wind \mathbf{v}

(however, it can tell us about our own motion \mathbf{u}). So, a very important error was done, when stellar aberration was used to rule out the entrained ether. The aberration in pulsar signals (detected by very long base interferometry, VLBI) has also been interpreted wrong in the same wrong way.

In order to explain these mistakes, we must regard the important difference between coherent systems, like telescopes, sensitive to phase in relation to systems detecting based on amplitude. Systems based on phase can detect wave front orientation but not ether wind inside the wave fronts. Detection by means of maximum amplitude can only be made in light focused into a beam. In light from fix stars we cannot see any maximum intensity. We have no beam and can only see wave front orientation. Transverse ether wind is therefore irrelevant. So, the correct model for stellar light (and for pulsar signals) is $c(1+v \cdot \cos A/c)$, defining the ray direction (apparent direction, dependent on \mathbf{u}), and this direction is just a way of defining the orientation of a surface by means of its normal. A is the angle between \mathbf{c} and \mathbf{v} . In most optical experiments this is the relevant light model.

When light is focused into a beam we can see the beam direction (real direction), where the correct model is $\mathbf{c}+\mathbf{v}$. This model demands detection by means of amplitude. The beam direction is the physical reality, and the ray is only a mathematical tool needed to represent the wave front.

Michelson and Morley's tests

Our earlier reasoning regarding stellar aberration can also be applied to the transverse (to motion) arm in Michelson and Morley's tests (MMX). Feedback in cavities of MMX type is a coherent process, and light in a standing wave takes the fastest way between mirrors. Boundary conditions implied by mirrors in a cavity have relevance for time and space dependent wave motion \mathbf{c} , but not for the local and constant condition (ether wind) $\mathbf{v}(\mathbf{r})$, independent of time. This means that the ray direction (\mathbf{c}) and not the beam direction [$\mathbf{c}+\mathbf{v}(\mathbf{r})$] is defined to be orthogonal to mirrors. Therefore, no effect of ether wind in the transverse arm in MMX. We can express this in other words by stating that moving the test equipment inside the planes of the cavity changes no boundary conditions, and therefore light has no reason to change behavior. We must also remember that $\beta (=v/c)$ is only about 10^{-6} due to planetary rotation. Stokes was wrong when he 'corrected' Michelson with a reduction by 50% in MMX prediction. By the same reason, Einstein was wrong when he, based on mistakes by Stokes and Lorentz, invented support for time dilation in his light clock.

These important mistakes were very helpful in gaining support for the Lorentz transform and time dilation. Lorentz transform is based on the absurd assumption that light moves with the same speed in relation to all observers moving with constant, but different, speeds. To find a better theory, without time dilation, we must use a contraction of physical bodies that is 2 times the Fitzgerald contraction. Instead of by time dilation observed effects must be explained by clock behavior. In the longitudinal arm in MMX the expected effect in 2-way speed of light is real, but compensated by the (now doubled) contraction of the test equipment. Atomic separations in crystals depends on how atoms inform each other by means of the ether. They thereby send information forth and back between them. So, separation between atoms in a crystal is controlled by a 2-way flow simultaneously between atoms. This flow between atoms can react to the ether in the same way as the light flow between mirrors, although the flow of information between mirrors is sequential. So, we find that MMX cannot tell us anything about the ether wind, since the effect in the longitudinal arm is compensated.

The special theory of relativity was based on MMX and stellar aberration, and since both tests are useless, this was a great mistake. We should correct this by abolishing the Lorentz factor and use a squared Fitzgerald factor for contraction of physical bodies. Stokes, Lorentz and Einstein did not observe the important distinction between ray and beam. This important error got support from

another important error in the absurd assumption of the same speed of light in different inertial frames. Two errors were abused for supporting each other.

Faraday's ether

Our knowledge of the ether today emanates from Faraday. He made ether experiments for many years, and also invented electrical systems like generators, motors and transformers. His work was translated from textual to mathematical form in 4 equations. These equations are honored and even printed on T-shirts. Nevertheless, the described object is denied. However, Faraday's work is not complete since the state of motion of the ether is not known. In error we have used stellar aberration and MMX to find the solution. For finding that solution we need a system that can measure the 1-way speed of light. The global positioning system (GPS) can do that, and is using this capacity for navigational purposes. The Sagnac correction in GPS indicates, that the system produces velocities related to the state of motion of the center of our planet. A frame (not rotating) in the state of motion of the center of our planet defining the ether wind, can therefore be united with the high precision in GPS. However, we cannot assume our own planet to entrain the ether in the whole Universe.

Fortunately, there is also an alternative solution. We can see this by regarding the fact that all GPS transmitters are situated on a spherically symmetric surface, and all receivers are on a smaller sphere concentric to the first surface. From this we can conclude that an ether wind described by a spherically symmetric field (a function of r and not a frame) can be united with the high precision in the GPS system. In fact, the high precision in GPS demands such a symmetry. This idea is also interesting from another point of view, namely from the fact that such an ether wind can explain gravity as well. With such a falling ether we do not have to explain gravity, as the bending of nothing, or as an action at a distance.

It is a remarkable fact that we today are glorifying the mathematical representation of Faraday's lifelong work, but nevertheless we seem to have forgotten all the physics. Another remarkable fact is that we accepted a young patent engineer, with some knowledge of physics, when he stated that two persons, born at the same time, could have different ages. However, when an experienced physics professor, after lifelong studies in physics, stated that 'physics without an ether is unthinkable' and that 'I am afraid that the theory of relativity will fall like a house of cards' we only laughed at him. This is wishful thinking. We are sensitive to emotions, but resistant to facts.

The falling ether

The ether is entraining matter to move in such a way (in a free fall), that gravity from distant bodies is not observable near that matter. However, the ether is also entrained by nearby matter in such a way, that a falling ether can explain gravity. This ether wind must be a function (a field) with spherical symmetry, and be directed towards our planet.

If we assume such a radial ether wind to have the same speed as a satellite in a circular orbit, at the same altitude as the ether wind, we can calculate many observed effects. We can find effects in GPS clocks, light bending near Sun, Pioneer anomaly, fly-by anomalies, gravity and gravitational anomalies. Many of these anomalies are easily calculated by the falling ether model, and these calculations seem to agree with experiences.

We have earlier seen that the speed in a 2-way flow of information between mirrors in MMX depends on the ether wind in the same way as the average speed in the 2-way flow of information between atoms in a crystal. This explained how a contraction of physical bodies compensated the expected effect in the longitudinal arm in MMX. However, the same type of 2-way information exchange also

should exist between a bound electron and its kernel. Since the Coulomb force field is compressed an amount $(1-\beta)$ in front of, and expanded by $(1+\beta)$ behind, the kernel (in the direction of motion), we can suspect that an orbiting electron is accelerated and decelerated during each orbiting period. This can therefore reduce the frequency of orbits by $(1-\beta^2)$. Therefore, the same type of effect also can explain the change in the frequency in atomic clocks. However, in this case the effect is not compensated. So, we can have 3 different effects dependent on the ether wind in the same way, namely a) 2-way light speed, b) contraction of physical bodies and c) the frequency of an atomic clock. This effect is $(1-\beta^2)$, and $\beta=v/c$. This means that we have an explanation to dilation of clocks, (not of time).

With the assumptions we have done we get an ether wind on Earth of 7.91 km/s (60 μ sec/day) vertically, and in the order of 0.3 km/s (about 0.1 μ sec/day) horizontally. In a GPS satellite we get an ether wind of 3.87 km/s (14.3 μ sec/day) in vertical as well as in horizontal directions. We assume satellites stabilized in direction towards Earth, and clocks orthogonal to this direction, but not stabilized in direction of motion. Therefore, the effect of motion is reduced by 50%. Instead of GRT we use the vertical ether wind, and instead of SRT we use the horizontal ether wind. The increase in clock speed when satellites are put into orbit becomes therefore: 38.6 μ sec/day $[60-14.3-0.5(14.3-0.1)]$. If clocks instead were directed towards Earth we get (without reduction by 50%) instead -14.2 μ sec/day $[0-0-1.0(14.3-0.1)]$. Clock speed is now decreased instead.

The same assumptions applied to our sun gives 30 km/s at the Earth distance from the Sun (1 AU), and 437 km/sec near the Sun. We cannot see the ether wind from the Sun since we are moving in orthogonal direction with the same speed. The bending of light can be found by integrating the ether wind's component in the ray direction along the ray direction. This calculation has not been done in detail. However, a very rough estimation gives something around 10^{-5} radians. This effect is caused by bending in two curves, first away from Sun and then back to the same direction (but not to the same position).

At a distance of 1 AU from the Sun we get 2-way light speed in radial direction $c(1-10^{-8})$ and at 20 AU we get $c(1-0.5 \cdot 10^{-9})$. This gives a frequency of $f(1-10^{-9})$ due to 2-way Doppler effect. Therefore, an increase in 2-way light speed can look like a decrease in the speed of the Pioneer space station, from 20 AU and outwards. This means that $\Delta f/f=10^{-9}$ can explain Pioneer anomaly by an increase in 2-way light speed (instead of a decrease in the speed of the space ship). See [1].

The fly-by anomalies can probably be explained in the same way as the Pioneer anomaly. However, the change in 2-way speed of light regards only the radial component, and most space stations, except Pioneer, move with high tangential speeds. So, we can expect the total effect to be smaller in relation to Pioneer anomaly.

A falling ether of 10^{-4} times c (30 km/sec) in radial direction towards the Sun is a way to explain gravity from our sun, and 7.91 km/sec near Earth explains gravity from Earth. This ether wind near Earth has not been discovered, since we have not been able to measure 1-way light speed. This is difficult. One effort was performed by de Witte, but he could only change direction of measurements by means of the rotation of our planet. Therefore, there were probably many systematic errors, like for instance due to temperature. Therefore, experiences from GPS is all we have regarding 1-way light speed. However, de Witte's method can be scaled down to a length of a couple of meters by the use of HeNe lasers instead of atomic clocks, and doing phase comparison by an interferometer. Dr C C Su has suggested such a method. [2]. A very simple method to test the falling ether is to change the orientation of an atomic clock from an east to west orientation to a vertical direction. The falling ether model predicts that clock speed will increase by 60 μ sec/day.

We have seen that the falling ether can give the same predictions, and even more predictions, as SRT plus GRT. However, we have an important difference in relation to GRT, since the vertical ether wind changes 2-way light speed in radial direction to Earth only.

Fatio's ether

The falling ether, described here, was suggested 300 years ago by Fatio; and later Le Sage described the idea in more detail. This falling ether describes gravity, without action at a distance, and without bending of nothing. Instead a flow, in all directions, of very small, and very fast, particles is assumed. Particles explain ether and waves explain light.

The falling ether is entrained as well as entraining. The ether is entraining a free-falling body in such a way that gravity from distant bodies is compensated by acceleration, and not observable from that body. The ether is also entrained by matter in a nearby body, due to attenuation of ether particles inside the body, and causing a shadowing effect. Therefore, the number of ether particles leaving the body is reduced, and therefore lower than the number of arriving particles. This difference means that the ether appears to be falling. However, there are some anomalies to this from bodies so near us that the mass point approximation is not valid. We can see that in gravity from our sun and our moon, and this effect is caused by the difference in gravity from those bodies, on opposite sides of our planet. This effect is observable in the phenomenon called tides. Another phenomenon, that also supports the falling ether model, is anomalies in gravity during solar eclipses. The gravity produced by the Sun is slightly reduced when passing the Moon. Since the Moon is smaller than the Earth this effect is not the same all over our planet, and it is this small gradient that makes this small effect observable, just like the effect in tides. An effect in vertical direction has been observed in a very sensitive gravimeter in China and is reported by Wang. [3]. During good weather conditions (or indoors) this effect can also be detected in horizontal direction. Such an observation has been reported by Janos Rohan. [4].

According to Newton forces of gravity from distant bodies can be added together like vectors, and this should also be valid for ether winds.

Summary

The addition of two light waves can produce zero light. This old enigma demonstrates that we do not have a correct model for light. We must have a solution to this problem, and stating light to be without energy is one way of solving this problem. Instead of transporting energy, light contains needed information to gain energy from the ether. Electrons generate potential forces, that later become real when light hits other electrons. This radical idea explains also another mystery, namely the idea that bound electrons can generate thermal radiation without losing speed. If we accept this idea we do not need Planck's idea of quantum jumping in connection with blackbody radiation. Instead, Planck's constant can reflect quantized charge in electrons, used for light detection. Light can be without photons, only waves are needed.

The wave model for light is also the best way to explain photoelectric effect, if we assume an interaction between tightly bound electrons and the potential energy in the electrons. We assume electrons to orbit inside the plane of the light wave fronts. The existing balance between two forces transverse to electron motion can be disturbed by a third force transverse to motion caused by light. This can be an effect of interference due to equality between light frequency and electron frequency. In the same way we can explain the first step in the Compton effect. The second step goes in opposite direction. So, Compton effect can be explained by an electron escaping one atom, and later being captured by another atom. The fact that there is a difference in frequency between the two X-ray packets proves that we have two processes in the Compton effect.

The traditional light model as the vector sum $\mathbf{c}+\mathbf{v}$ is relevant only if we can detect the beam direction by means of amplitude information. In most optical experiments phase information only is available and this means that we cannot see ether wind blowing inside the plane of the wave fronts. We can only see the ray direction defining the orientation of the wave fronts. The relevant light model becomes now $c(1+v\cos A/c)$. A is the angle between \mathbf{c} and \mathbf{v} . So, we find that transverse ether wind cannot explain: a) stellar aberration, b) not effect in transverse arm in MMX and c) not change light behavior in Einstein's light clock. In the majority of optical tests, we have used the beam direction instead of the ray direction. Remembering that $\beta (=v/c)$ is in the order of 10^{-6} (not 10^{-4}) due to the rotation of our planet we see that these effects are small in relation to the sizes of the mirrors. So, we must decide by means of logic and not by observation. The reasoning based on beam, instead of ray, has been devastating for physics. The prediction for MMX and the assumption of Fitzgerald contraction have both been too small by 50%. The difference opened a way to put in time dilation, although this dilation is based on an absurd assumption that light moves with the same speed in relation to all inertial observers. Therefore, SRT was based on two errors supporting each other.

We must give up the Lorentz transform, and use a squared Lorentz factor to compensate the effect in the longitudinal arm in MMX. This is logical since a 2-way flow of information between mirrors can act on the ether wind in the same way as 2-way flow of information between atoms. However, we have also a 2-way flow of information between an electron and its kernel, so electrons in atomic clocks move forth and back in relation to the ether wind. Therefore, the speed of the electrons is changing during each orbiting period between $1+\beta$ and $1-\beta$. So, we can expect the same ether wind dependency also in the speed of atomic clocks. Therefore, the ether dependency of $1-\beta^2$ is valid for a) 2-way light speed b) contraction of physical bodies and c) the speed of atomic clocks.

The Sagnac correction in GPS tells us the speed of a point on Earth in relation to the center of the planet, and this information is based on 1-way speed of light. The spherical symmetry in the localizations of transmitters and receivers indicates that the ether wind also must be represented by a spherically symmetric field. Otherwise the high precision would be impossible. Therefore, the ether wind can be falling towards our planet, and explain gravity. We test this idea by assuming an ether wind, in radial direction, equal to the speed of a satellite in a circular orbit, at the same altitude as the ether wind. We find that these calculations give the same results as are observed in GPS clocks and earlier explained by SRT plus GRT. Besides, we can also explain several other phenomena.

Result

We have found a way to explain:

- GPS system and GPS clocks
- The mistake of using $\mathbf{c}+\mathbf{v}$ instead of \mathbf{c} in most experiments
- Destructive superposition in light
- Thermal radiation without quantum jumping
- Gravity and anomalies in gravity
- Pioneer and fly-by anomalies
- Light bending near the Sun

We can test this theory by changing the orientation of an atomic clock.

More details are available at:

<https://www.morebooks.de/store/gb/book/physics-without-photons/isbn/978-3-330-34966-7>

Discussion

Physics includes many unexplained phenomena, not addressed in this article: Celtic stones, Crookes' radiometer, ball lightnings, magnetic forces, electric forces and many more. We seem to do very little critical thinking regarding these very fundamental problems. Scientific work appears to be driven by looking only in one direction, namely forwards. Therefore, science today is to a great extent science fiction. We are listening after signals from intelligent lifeforms, instead of looking for anomalies. Perhaps the greatest hindrance to finding more knowledge is the illusion that we already know. Sometimes it seems to be more difficult to unlearn than to learn.

In this article we have discussed two important problems, namely the paradoxical destructive superposition in light, and the not recognized distinction between beam ($\mathbf{c+v}$) and ray (\mathbf{c}).

Another mistake is to focus too much on mathematics. We forget Faraday's gigantic work regarding the ether, but we are glorifying its translation into mathematics. We also forget Tycho Brahe's lifelong work in astronomy, but are glorifying a change in the mathematical model for planetary orbits. Kepler's work could easily have been done by someone else, but how long time would it take until we got someone like Tycho Brahe? We should also honor Giordano Bruno who preferred dying, instead of lying. Copernic wrote a book that was excepted after more than 200 years.

We must remember that new knowledge often changes the fundamental structure, and seldom is a simple addition to what we already have.

References

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