Stokes Was Wrong

John-Erik Persson
Fastlagsvägen 2, 12648 Hägersten, Sweden
e-mail: johnerikpersson@yahoo.com

This article describes an ether that is not autonomous or entrained in velocity. Instead of entraining the ether a celestial body absorbs a very small amount of ether particles passing through the body. This causes a very small net velocity in the average value of all particles velocities. The ether gets a small velocity in direction towards the body. This generated ether-wind follows the body like a shadow and causes gravity. Spherical symmetry means that one body is not decelerated by its own field. However, two bodies disturb the symmetry to each other and are therefore pushed in direction towards each other. The generated ether-wind causes gravity. The ether particles move with the speed *c* and can also transfer light. The ether particles do not collide with each other and the ether is not a gas but a special state of aggregation. Light contains information that, together with the ether can interchange energy with matter. We cannot know if this energy comes from light or from the ether. In this theory light is waves and ether is particles.

1. Background

Stellar aberration, Michelson and Morley's tests and Sagnac effect are the most important phenomena in relation to the theory of special relativity. However, the interpretations of these phenomena are not clear and unambiguous. The mechanism behind gravity is not known. Theoretical physics has therefore been in a state of uncertainty for many decades. Many questions without answers imply a need for analyzing the most basic phenomena in physics. Due to many errors it can be difficult to see the first, and therefore most important, error. It is therefore very important that we look backwards in time far enough to see the first and most important error.

2. The Motion of Light

Maxwell assumed the existence of an ether and probably also was aware of the fact that his theory was not complete. Maxwell started with two first order differential equations, and then solved one differential equation of second order. The general solution **c**t represents general properties of the ether. However, regarding the ether's state of motion in point $\vec{\mathbf{r}}$ we can have a particular solution $\vec{\mathbf{v}}(\vec{\mathbf{r}})$, representing the local motion of the ether. $\vec{\mathbf{v}}(\vec{\mathbf{r}})$ is constant in relation to time *t*. The complete solution is therefore $\int\left(\vec{\mathbf{c}}+\vec{\mathbf{v}}(\vec{\mathbf{r}})\right)dt$. Wishful thinking by Lorentz produced the solution $(\vec{\mathbf{c}}+\vec{\mathbf{v}})t$ and Einstein's solution $\vec{\mathbf{c}}t$ is even worse. The more general third option has not been very popular. One reason is a wrong interpretation of stellar aberration, as we will later see.

Another reason can perhaps be a misunderstanding of Occam's razor. Einstein can perhaps have assumed $\vec{\mathbf{v}}(\vec{\mathbf{r}})=0$ to be the simplest solution, but this solution cannot be included logically. It is not correct to conclude impossible experiment, and not existent ether, from Michelson's many failures. Lorentz' idea, that $\vec{\mathbf{v}}(\vec{\mathbf{r}})=\text{const}$, is also wishful thinking and $\vec{\mathbf{v}}(\vec{\mathbf{r}})$ cannot be represented by a frame. Therefore we have to accept the only remaining alternative, that $\vec{\mathbf{v}}(\vec{\mathbf{r}})$ is a vector field. The general solution $\vec{\mathbf{c}}t$ represents only general properties existing everywhere in space. We must also regard local conditions in the ether, and these conditions are represented by the ether-wind $\vec{\mathbf{v}}(\vec{\mathbf{r}})$. The correct solution is therefore $\int\left(\vec{\mathbf{c}}+\vec{\mathbf{v}}(\vec{\mathbf{r}})\right)dt$. This interpretation is the simplest interpretation in a *physical* perspective. A useless debate regarding the ether's existence has dominated over a more important debate regarding the state of motion of the ether. The question is not frame or no frame, but frame or field.

Michelson predicted the two-way speed of light to be proportional to $1-\beta^2$ ($\beta=v/c$; v is ether-wind). Michelson stated that he could detect this very small effect by using as a reference an equipment equal to the measuring equipment but oriented orthogonal to the measuring equipment. Michelson assumed no effect in the reference arm transverse to ether-wind. Stokes objected to this idea and stated that an effect in the reference arm would be $\sqrt{1-\beta^2}$, or about half the change in the measuring arm. Stokes idea was accepted by most scientists, but not by Michelson. Stokes derived his effect by means of Pythagoras' theorem. Stokes derivation was wrong.

Stokes idea cannot be united with the wave model for light. According to the wave model for light, speed c must be constant in relation to the ether's state of motion and orthogonal to the wave front. The waving is a behavior inside the ether without knowledge of the ether's state of motion, and this waving is defined by the medium. The motion of light must therefore be described as a vector sum $\vec{\mathbf{c}}+\vec{\mathbf{v}}(\vec{\mathbf{r}})$. This follows from the fact that transverse ether-wind has the same effect all over the wave front and wave front normal is conserved in relation to transverse ether-wind. The wave fronts in an interferometer are always parallel to the mirrors in the equipment, and interferometers are blind to transverse ether-wind. This means that only one component in the ether-wind has relevance in the interferometer. The interferometer detects therefore $\vec{\mathbf{c}}\left(1+v_c(\vec{\mathbf{r}})/c\right)$. Here v_c is component in **v** parallel to **c**. Transverse ether-wind cannot bend the wave fronts. Such bending is possible only by a gradient in v_c. This is a very important conclusion and we can conclude that Michelson was right and Stokes was wrong. Transverse ether-

wind cannot reduce light speed. The vector sum of $\vec{\mathbf{c}}$ and $\vec{\mathbf{v}}(\vec{\mathbf{r}})$ would be of interest only if we wanted to detect the direction of a focused beam, but in interferometers and telescopes it is the normal to the wave fronts inside the beam that is relevant.

Einstein inherited Stokes mistake and used this error to motivate time dilation. The theory of special relativity is therefore based on a wrong idea by Stokes, and not only ideas from Poincarè and Lorentz. The concept time dilation has also been used to explain slowing phenomena in atomic clocks. These effects are of second order in v/c and also explainable by a mechanical process inside the clocks, as we will later see. This interpretation is analogous to the effect searched by Michelson and Morley. This means a physical property of clocks instead of a metaphysical concept in time itself.

3. Stellar Aberration

Analogous to how interferometers and lasers *define* the normal to the wave fronts a telescope *detects* the normal to the wave fronts. The telescopes are therefore also blind to transverse ether-wind. This means that stellar aberration cannot tell us anything about the ether-wind. Instead stellar aberration can tell us about our own state of motion. When light's wave vector **c** is transformed into the frame of the observer, moving with transverse speed u, the apparent direction of light is changed an angle $\arctan(u/c)$. This is independent of transverse ether-wind v. This means that we can explain stellar aberration for light waves by the same model that once was used for light particles, the so called raindrop effect. The effect of observer motion in relation to a moving phenomenon must be the same independent of if the phenomenon is a wave or a particle. Explanations of stellar aberration by means of Fresnel drag are false. See [1]. Stellar aberration cannot refute any ether model.

Airy's test with water in a telescope failed. When the wave vector of light **c** is transformed into the frame of the observer, moving with the transverse speed u, apparent direction of light is changed an angle $\arctan(u/c)$. Apparent normal to the wave front is then in line with the telescope, and water cannot change anything.

4. Michelson and Morley

Michelson wanted to detect a second order effect of the ether-wind by sending light forth and back between mirrors. The atoms in a crystal control their separations by the effects that they impose on the surrounding ether. It is not easy to see any other possibility. The position of one atom is therefore communicated to its neighbor by means of the ether. The atoms are in a two-way communication by means of the ether. Positional changes are transformed with the speed c, just like light waves, since light waves are also changes in the ether. Communication between atoms is simultaneous in both directions. The communication between Michelson's mirrors is sequential in the two directions. We can nevertheless assume the same effect in the two cases, since the ether-wind $v \ll c$, the wave velocity. The reduction in two-way light speed is therefore equal to the reduction in separation of atoms in the crystal. Since this separation defines the separation between mirrors in the equipment we can conclude that the time for two-way communication is not changed. This fact explains that Michelson failed due to a contraction of physical objects. This contraction is two times the effect on space in the theory of relativity. However, this effect is not combined with dilation of time.

5. Sagnac Effect

Calculations of the Sagnac effect have commonly been done in the rotating frame of the equipment. This can depend on influences from Michelson and Morley's tests. Since light is a motion in one dimension we must focus on light and not on equipment. The equipment changes the length of the light path, and not the speed of light. Therefore, the not rotating frame is the correct frame for calculation of the Sagnac effect. In this frame the second order term disappears. This fact may not be important, but it is very important that we have focus on light, and not on equipment. Mistake on this point is the reason to the fact that Sagnac effect has been described by a *rotating area*. This interpretation is wrong, since no light exists in that area. Light exists only on the line enclosing the area. Sagnac effect must therefore be described by a *translating line*. Sagnac effect is caused by translation, and closing the line was needed only for *detection* of the effect, and caused by the synchronization problem. This error in classification is the reason to the fact that Sagnac effect has not been clearly explained after 100 years. Many scientists have tried about 20 different theories to explain the effect. This is described in [2].

Interferometers compare phase between two parallel wave fronts. Interferometers detect therefore a difference in one dimension only. This limitation means that only translation can be detected. The *physically* correct definition of the time delay in Sagnac effect is therefore $2vL/c^2$ with v as tangential velocity of a circular line of circumference L. The alternative expression $4\Omega A/c^2$ is only correct in a mathematical sense (Ω is angular velocity and A is area).

The classification of Sagnac effect as a translational effect is very important. This means that the effect observed in a rotating circle also exists in a straight line of length L, moving with the speed (in relation to the ether) v in its own direction. The effect is vL/c^2 (one way). The ether-wind is detected. Evidence for this translational effect is found in the global positioning system (GPS). Compensation for the effect is done when time stations on Earth are compared. GPS measures position based on one way propagation of microwave signals. This means that the synchronization problem is circumvented. GPS is a very good test bed for special relativity due to the very high precision in the system. The GPS experiences indicate that the state of motion of the ether depends on our planet's translation, but not on its rotation. However we will later see that the ether-wind has a value that is much smaller than the speed on individual ether particles. Therefore we find that the ether is not entrained, only the ether-wind is. Disregarding the validity of Sagnac effect in translational situations produces a timing error. This problem is explained away as a production of 'local' time. According to H Nordenson [3] local time disproves the theory of relativity. We do not need twins. Nordenson also said that demanding a complete substi-

tute before abolishing Einstein's theory of relativity is grotesque logic.

6. Ether-Wind Detection

An ether-wind inside the wave front of light, and transverse in relation to propagation, cannot change the orientation of the wave front. A telescope detects the normal to the wave front. Therefore, stellar aberration cannot tell us anything about the state of motion of the ether. Michelson and Morley's method fails to detect a second order effect of the ether-wind by means of a two-way communication between mirrors. The reason is that a two-way communication also exists between atoms in crystals and the searched effect thereby is compensated by a reduction of physical length in the construction used. Michelson and Morley's method can therefore not tell us anything about the ether's state of motion. A second order effect of the same kind is instead observed in atomic clocks. However, Sagnac effect is a translational effect distributed along a line. Sagnac effect is therefore a first order, longitudinal effect of an ether-wind.

7. Structure of Light

There are lots of phenomena demonstrating that light is a wave motion. The particle model for light is supported only by the stimulated emission of electrons in the photoelectric effect and in the Compton effect. However, these two phenomena can also be explained by electromagnetic waves interacting with electron particles. The fact that higher frequencies in monochrome light can produce faster photo electrons can be explained by the fact that these electrons are faster *before* emission also. The emission can be caused by an interference between frequency in light waves and frequency in electron's orbiting. In the Compton effect we can assume X-ray wave packets to be concentrated in time and space and thereby mimic the behavior of a particle. We conclude that photoelectric effect and Compton effect can both be explained by particle model as well as wave model for light. These two phenomena are therefore of no use regarding model for light.

Electromagnetic waves interact with slow electron particles in atomic clocks and with very fast electrons in the Mössbauer effect. The Crooke's radiometer can help us to see the model for light. If the evacuation of the radiometer is very well done the recoil from photoelectrons can be expected to dominate over the effect from remaining gas molecules. The direction of the radiometer's rotation can thereby tell us regarding wave or particle model for light. This is described in [4].

Since we have lots of evidences for the wave model for light and no certain evidence for the particle model we must conclude that light is a wave motion. Two light waves in opposite phase can produce zero light and demonstrate destructive superposition. This fact is apparently in conflict with the law of energy conservation. We have therefore reason to ask if light really can transport energy and contain mass. Since light, as well as ether, are not observable we draw all our conclusions from observations on charged particles emitting and absorbing light. Energy in charged particles changes when light is absorbed or emitted. Since our experience is limited to material effects we do not know if matter interacts with light or with ether. We do not know if energy exists in light. However, the existence of gravity implies that the ether has mass and thereby energy. It is therefore possible that light only contains information needed to allow an energy interchange between ether and matter. If this is true the expressions for energy hf and momentum hf/c may refer to the ether instead of to light. Only f refers to light since interference demands $f \approx f_{light}$.

8. Structure of Ether

Newton's and Einstein's theories about gravity describe only effects of gravity and say nothing about the cause of gravity. Fatio and Le Sage have described a particle model for gravity that also explains the cause of gravity. Particles with very high speed are moving in all directions. A very small part of these particles are absorbed in a celestial body, like our planet, and causes internal heating in the body. Due to this absorption fewer particles are leaving the body than are approaching it. The average value of all particle velocities has therefore a velocity that is small in relation to individual particle velocity. This means that the ether is falling towards the body and this velocity is the cause of gravity. In a universe with only one body frictional forces inside the body add up to zero due to spherical symmetry, and the body can move without being decelerated by friction. In a universe with two bodies these bodies are disturbing the symmetry to each other. The bodies are therefore pushed in direction towards each other. This means pushing gravity. If individual particle velocities are assumed to be c we can explain propagation of light as well as of gravity. This interpretation does not mean that the ether in itself is entrained, but a property of the ether, namely the ether-wind, is entrained. Gravity, and ether-wind, are following the body like shadows.

It is important to notice that we have found an ether model that can explain how the ether can push two bodies towards each other but nevertheless let one body move without being decelerated by the ether. Although gravity is a relation among moving particles it is a condition that is static in relation to the body generating gravity. Since gravity in itself does not move the observer's state of motion is irrelevant. We can therefore not observe aberration in gravity from our sun. No aberration in gravity is also an evidence against the wave model for gravity since it would demand enormous speed of propagation. However *changes* in gravity can move with a speed c. Gravitational shielding from the Moon during an eclipse should therefore produce an aberration in shielding equal to optical aberration, namely $\approx 3\times10^{-6}$ radians due to orbiting with ≈1 km/s. Unfortunately, gravitational shielding is a very small effect.

A comparison between Newton's and Le Sage's gravities is interesting. To do this we can first express Newton's gravity in a more general form. We can use an integration of density divided by square of distance over volume. The comparison reveals a small difference: An exponential function representing gravitational shielding is missing in Newton's model. Gravitational shielding is a very small effect and very difficult to detect. An approximation of shielding as not existent can therefore render a unification between Newton and Le Sage in most practical cases. Newton makes Le Sage's theory usable and Le Sage explains Newton's theory.

9. The Ether-Wind

Since gravity and ether-wind are produced by attenuation in matter inside a celestial body like our planet we can conclude that rotation of the body is approximately irrelevant in relation to gravity and ether-wind due to spherical symmetry in the density function of the body. Rotational symmetry follows from the fact that gravity in itself produces spherical symmetry in not rotating bodies. The irrelevance of planetary rotation in relation to the state of motion of the ether is supported by the experiences from the GPS system. We have seen why the ether-wind is in line with gravity but we do not know the magnitude of the ether-wind. A preliminary hypothesis was suggested in [4]. It was thereby assumed that the vertical ether-wind is equal to the speed of a satellite in circular orbit at the same altitude as the ether-wind. This assumption gave a value of 7.91 km/s near our planet, and 3.87 km/s in a GPS satellite. Dr C C Su has described a method by which this vertical ether-wind can be measured. A horizontal ether-wind of max 0.465 km/s due to planetary rotation can also be measured. This method is described in [5], and also in [4].

The factual slowing of clocks in the GPS system can be explained without assuming dilation of time. Instead the ether-wind can be assumed to affect the orbiting of the electrons in the atomic clocks. The ether-wind increases the time for a half period in one direction and decreases the time in opposite direction. This produces a second order effect of the ether-wind's component inside the plane of the electron orbits. This effect is of the same kind as the effect in the two light propagations in Michelson and Morley's tests. The clock frequency becomes proportional to $(1-\beta^2)$ with β as v/c. This relation is valid for both vertical and horizontal ether-wind, since gravity is assumed to be caused by a vertical ether-wind. Instead of two models for time dilation we have only model for clock slowing.

In Michelson and Morley's tests one-way speed of light was assumed to be $\sim(1\pm\beta)$ producing a two-way speed $\sim(1-\beta^2)$. The electrons orbiting atomic kernels move with a speed u that is much smaller than light speed c. This fact does not exclude a possibility that $u \sim c$, since u and c are defined by the same kind of differential equations. The two half periods in an electron's orbit can be different in the same way as in Michelson and Morley's experiment. The difference being the fact that the effect is not compensated in atomic clocks as is the fact in Michelson and Morley's test.

With earlier given values on vertical and horizontal ether-wind on Earth and in a GPS satellite we can calculate the change in clock speed when a satellite is put into orbit. The small effect of Earth' rotation is not considered. These values give an *increased* clock speed of 38.5 μs/day. Satellites are assumed to be stabilized in direction towards the Earth with clocks orthogonal to this direction. This means maximum slowing due to vertical ether-wind (gravity). The satellite was assumed to not be stabilized in relation to motion. Therefore contribution from horizontal ether-wind (velocity) has been reduced by 50% due to satellite rotation. This value is found by taking the average of a squared cosine function.

If the clock were oriented in line with gravity the contribution from vertical ether-wind would be zero. Instead the contribution from horizontal ether-wind is at maximum value. This calculation gives a *decreased* clock speed of 14.4 μs/day. This fact indicates an easy way of testing this theory by changing clock orientation. The alternative orientation means also independency of satellite rotation.

10. The Wave or Particle Confusion

According to the interpretations in this article stellar aberration and Michelson and Morley's tests are useless in relation to the ether-wind. Instead a second order effect comparable to Michelson and Morley's is observed in atomic clocks. A physical mechanism substitutes the metaphysical concept of time dilation. The Sagnac effect detects also an ether-wind by the first order translational effect in an interferometer sensitive in one dimension only. Light has thereby been described by the wave model only. To describe the ether we need only the particle model. Small and fast particles have been assumed to move in all directions. Light propagation has been described by the speed of individual particles, and gravity by an asymmetry in the flow of particles. We therefore find that the interpretations presented here do not demand any wave or particle duality. These interpretations can indicate that the mean distance between ether particles is very small in relation to the wavelength for light.

Since ether, as well as light, is not directly observable we have to draw conclusions about these two concepts from observations on charged particles. We thereby find that emission or absorption of light changes energy level in charged matter. All information about light comes from observation on matter and we do not know if energy in matter is interchanged with ether or with light. Since the ether can propagate the force of gravity the ether must have mass and energy, but we do not know if mass and energy exists in light.

11. Wave Front Bending

We have seen that ether-wind inside the wave front cannot bend the wave front and not explain stellar aberration. However wave front bending is possible due to a gradient in the longitudinal component in the ether-wind. The observed bending of light near our sun can be explained in this way if we assume the falling ether radial to our sun. This ether-wind becomes equal to 437 km/s according to the same assumption earlier done for our planet. For light tangential to our sun we first get a positive component, and later a negative, from the ether-wind. Since the effect is strongest nearest to the Sun we get a bending first away from the Sun and later back to the same direction. The bending is not to the same position and we can calculate the difference as an integration of the gradient in longitudinal ether-wind v_c. We can describe this as $\int \nabla v_c(\mathbf{r}) d\mathbf{r}$.

A very, very rough estimate can be found since the vertical ether-wind of $1.46\times10^{-3}\times c$ produces a longitudinal component of about $10^{-3}\times c$, maximum value. Apparent size of the Sun is about 10^{-2} radians. We get an estimate in the order of 10^{-5} radians as observed. This is described in [4]. A more accurate calculation should be done according to the earlier described integration.

12. Summary

An important property of this theory is that wave front bending cannot be produced by transverse ether-wind. Such bending

is possible only due to a gradient in the longitudinal component of the ether-wind. Since light is a wave motion we can describe it by the vector sum $\mathbf{c}+\mathbf{v}(\mathbf{r})$. However, in telescopes and interferometers only $\mathbf{c}(1+v_c(\mathbf{r})/c)$ is relevant (v_c is longitudinal component). Stokes was wrong when he reduced Michelson's prediction by 50%. Einstein reused the mistake and called it time dilation.

The ether theory described here is based on Le Sage's theory of gravity. Many ideas are in agreement to ideas from Petr Beckmann and van Flandern. Specific for this theory is that the speed of gravity particles is assumed to be c, the speed of light, which means that the ether can explain light propagation as well. Celestial bodies, like our planet, absorb a very small part of passing ether particles. This fact produces an ether-wind many orders of magnitude smaller than light speed (falling ether), that causes gravity. The direction of the ether-wind is in line with gravity, but the magnitude of the ether-wind is not known. This means that the ether-wind, but not the ether itself, follows a celestial body just like the field of gravity.

Telescopes detect the normal to the wave fronts and cannot tell us anything about the ether-wind inside these wave fronts. Stellar aberration reveals only observer's own motion. Interferometers detect translational effect in one dimension longitudinal to light. Sagnac effect is therefore an important phenomenon regarding the ether's state of motion. It is therefore very important to see that Sagnac effect is produced in a *translating* line and not in a *rotating* area.

A second order effect of the ether-wind reduces the two-way speed of light. The same effect reduces the separation between atoms in a crystal and compensates therefore the speed effect by a contraction effect in the equipment used by Michelson and Morley. The time for two-way communication is therefore constant. In atomic clocks orbiting electrons move faster in the direction of the ether-wind, and slower in opposite direction. This means that the component of the ether-wind inside the plane of the electrons' orbits affects the speed of atomic clocks in a way comparable to the effect in Michelson and Morley's test. Therefore, the effect Michelson searched in vain is visible in atomic clocks.

The ether model described here can explain why *one* body can move without being retarded by the ether although the ether can push *two* bodies in direction towards each other. Internal heating in celestial bodies is also explained. Since the force of gravity is stationary in relation to the source of gravity *zero* speed of gravity explains no aberration from our sun. The assumed speed c of gravity particles means that *changes* in gravity by shielding are propagating with the speed c. Unfortunately, these effects are probably too small to be detected.

13. Discussion

The theory of relativity has been debated for almost hundred years. However, the debate has mostly been concerning inconsistencies internal to the theory. In this article the focus is instead on the interpretations of observed phenomena. We have seen that many of the most important phenomena have alternative interpretations. Discussions on this subject have been focused on Einstein. It has therefore not been observed that the first, and therefore most important, error was produced by Stokes and only inherited by Einstein. Stokes introduced the idea that an ether-wind, blowing inside the wave front, can reduce the speed of light. In the theory presented here ether-wind and wave velocity add to each other like vectors. They become independent of each other when they are in a right angle to each other. Therefore, Stokes was wrong when he reduced Michelson's prediction by 50%. Einstein accepted this idea and called this effect time dilation. This mistake was an important ingredient in the abolishing of the ether. After the introduction of general relativity theory Einstein tried to reintroduce the ether, but the mainstream of scientists refused. Since black energy and black matter are accepted concepts it is remarkable that black ether is still denied.

Data from GPS satellites must be handled in a not rotating frame centered on our *planet*, but data from fix stars and pulsars must be handled in a not rotating frame centered on our *sun*. Therefore, every celestial body needs a frame of its own in its near neighborhood. This is an indication that these frames are not real, but only approximations to one single *field* dependent on the distribution of matter. These facts support the entrained ether-wind blowing in the direction of the force of gravity. Gravity is explained by the ether-wind, and we detect the ether-wind with our own bodies.

The fact that interferometers and telescopes are blind to transverse ether-wind is important. This fact explains why stellar aberration is useless regarding the ether-wind. Michelson and Morley's tests are also useless. The ether-wind is observable in Sagnac effect and in atomic clocks. In this theory *two* metaphysical phenomena in *time* have been substituted by *one* physical *mechanism* in clocks. A metaphysical phenomenon in space has also been substituted by a physical contraction of objects.

The debate around modern physics seems to be dominated by binary logic. That is: does the ether exist or not and forgetting the next question: is the ether entrained or autonomous? The ether presented here is not autonomous and not entrained in itself. Instead two properties of the ether are entrained: gravity and ether-wind. We have also a kind of confusion regarding speeds: In this article the speed of gravity itself is *zero* (implying no aberration). The ether-wind is $v \ll c$. The speed of light, individual ether particles and changes in gravity (shielding) is equal to c. The ether theory in this article contains no wave or particle confusion. Light is waves and ether is particles. Reality of the ether means also that matter waves can be explained as an effect that a moving particle imposes on the ether. When a moving mass changes velocity its generated matter wave must also change. This change can consume energy and thereby explain inertia. A real ether can also explain internal planetary heating and black matter and black energy. A remarkable property of the ether described here is its ability to impose forces on two bodies but not affect one single body.

Perhaps this ether model can help us to explain destructive superposition also. The interchange of energy between *light* and charged particles can be an illusion. Instead we can have an interchange between *ether* and charged particles, and light only be containing needed information. Polarization of ether particles is a possible representation of such information. This interpretation is possible since light and ether are not observable and *all* information comes from observations on charged material particles.

The ether concept is very difficult, and it is remarkable that light from fix stars can move billions of light-years and still present sharp images. Perhaps this can indicate that the ether has its own state of (no) aggregation since, apparently, ether particles do not collide with each other. Anyhow, the theory presented here can explain many phenomena, and is therefore suitable for testing. Testing can easily be done by measuring vertical and horizontal ether-wind by Dr Su's method [5], by changing orientation of atomic clocks in GPS satellites and by calculating light bending near our sun as earlier described. However, the effect of gravitational shielding is probably too small to be observable.

14. Conclusion

The theory of special relativity was not a work of Lorentz and Poincaré alone. An important (and wrong) base for the theory was earlier provided by Stokes when he introduced the idea that an ether-wind transverse to the propagation of light can reduce the speed of light. Stokes' reduction due to transverse effect is about half the value of Michelson's longitudinal effect. Michelson never accepted Stokes' idea and we have seen in this article that *Stokes was wrong*. However, Einstein accepted Stokes' idea and called it time dilation. An evident slowing of atomic clocks in the GPS system is in this article explained by a physical mechanism inside the clocks. We do not need Stokes model. *The ideas presented here can be tested by changing orientation of clocks in the GPS satellites.*

The ether described in this article is not autonomous and not entrained in itself. However, two properties of the ether are entrained: gravity and ether-wind blowing in the direction of gravity. These two properties follow a celestial body like shadows. The magnitude of the ether-wind near our planet is not known but estimated to be in the order of 10^{-5} times the speed c, the speed of individual ether particles. *The magnitude of this ether-wind can be measured by a method described by Dr C C Su,* [5]. The ether model described here does not need wave or particle dualism and can explain why the ether can push two bodies towards each other but not impose any force on one single body. Newton's theory of gravity can give us the ether-wind as well.

The bending of light near our sun is not produced by transverse ether-wind. Instead a gradient in longitudinal ether-wind can produce a bending effect in a wave front. *This bending can be calculated by a method described in this article.*

The debate around the great confusion in modern physics has been focused too much on Einstein. Is he right or wrong? This narrow focus has obscured the fact Stokes made the *first* and most important error, and thereby fooled Einstein.

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