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The Constancy of Astronomical Time

Frederick David Tombe,
Northern Ireland, United Kingdom,
sirius184@hotmail.com
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Abstract. **The transformed time in a Lorentz transformation was originally intended to apply to local time as opposed to astronomical time, but without any clear definition as to what was meant by the term *"local time"*. This article will seek to place local time on a firm physical basis that is relevant to the context under consideration.**

Introduction

I. Relativists will of course stringently deny that any problem exists at all with Einstein's special theory of relativity, but nevertheless, a debate surrounding what became known as the *clock paradox* or the *twin paradox* arose in the wake of that theory as a direct consequence of Einstein discarding the luminiferous medium. Previously, within the context of what is broadly termed the *Lorentz Aether Theory*, [1], [2], there was an absolute standard of rest embedded in a physical medium that served as the carrier of light waves, and hence there were no paradoxes. Yet, while reverting to the pre-Einstein situation would remove the clock paradox, the Lorentz aether theory itself still doesn't resolve the mystery implicit in the Lorentz transformation, whereby the rate of passage of time inexplicably changes according to speed and gravitational field strength.

Time Dilation in Einstein's Theories of Relativity

II. Solar time is based on the observation that the Earth completes an orbit of the Sun, relative to the background stars, in a unit of time known as the *year*. Meanwhile, Einstein's special theory of relativity tells us that two clocks in relative motion will both tick slower than each other. And even though relativists somehow manage to persuade themselves that the theory means that only one of the two clocks ticks slower than the other, this still doesn't solve the problem of how their relative motion could possibly have any bearing whatsoever on the period of the Earth's orbit around the Sun, since these are two physically disconnected events. It's impossible to see how local motion or local gravity could have any physical effect that would impinge on the passage of astronomical time. Clearly therefore, the transformed time in a Lorentz

transformation cannot be astronomical time. Instead, the time variables used in a Lorentz transformation must refer to an alternative measure of time that is based on the period and frequency of a physical process that is actually involved in the context where the transformation is being applied. And likewise, the space variables must relate to some unit in the fabric of the relevant material.

Atomic Clocks and the GPS

III. A well-known application of the Lorentz transformation is found in relation to the caesium clocks in the orbiting satellites of the Global Positioning System. The calculations are based on the motion of these clocks relative to an Earth-centred inertial frame of reference that is not co-rotating with the Earth's diurnal rotation relative to the background stars. We know that the motion of the satellites in the ECI frame definitely causes the clocks to tick slower, and that meanwhile, the clock rate is increased as the clocks go higher where the gravitational field strength is lower. This testifies to the belief that the motion of the clocks relative to the ECI frame must involve a physical interaction between the luminiferous medium and the caesium atoms themselves which changes the associated period of their spin. This will surely be due to a complex precession that is induced via a shear interaction with the physical substance of the luminiferous medium, which is at rest in the ECI frame. As such, it makes total sense that the time variables in the Lorentz transformation, in this particular physical context, are not astronomical time at all, but rather an alternative time whose unit is based on the caesium atoms themselves, this being something which is induced to physically change as the caesium atoms move through the luminiferous medium. As regards the gravitational clock dilation, this can similarly be explained as a physical interaction between the caesium atoms and an inflowing aethereal fluid in conjunction with the escape velocity. This in-flowing aethereal fluid cannot in itself be the same thing as the luminiferous medium, but the latter will be a sea of tiny vortices formed from the same aether, **[3]**.

The mathematical form of the so-called relativistic energy equation follows from the Lorentz transformation as applied using four-vector algebra. In the article entitled, ***"Atomic Clocks and Gravitational Field Strength"***, **[3]**, we see how this same equation can be obtained, *approximately*, by using a binomial expansion, although it still remains unexplained as to where the speed of light fits into the caesium atom, if it actually does at all.

The Speed of Light

IV. If, as is suggested in the previous section, the luminiferous medium is comprised of tiny aethereal vortices, and these should happen to have circumferential speeds equal to the speed of light, then we would have fully accounted for the Lorentz transformations in relation to electric and magnetic fields, **[1]**. But when applied to ponderable matter we would still not have accounted for the involvement of the speed of light. Unless the average circumferential momentum of the atoms and molecules of ponderable matter where to yield a *'speed of light'* equivalent, we would expect that a scaling factor would be needed when applying the Lorentz transformation to kinematics. This scaling factor may even take the form of a reduced value for *c*. It is therefore more likely than not, that the null result of the 1887 Michelson-Morley experiment is explained by the luminiferous medium being entrained within the Earth's magnetic and gravitational fields as the Earth orbits the Sun, rather than it being explained by Lorentz-Fitzgerald contraction.

Conclusion

V. The paradoxes and contradictions associated with time dilation that are implied by the Lorentz transformations are not resolved by altering the equations themselves, and they are only partially resolved by restoring the luminiferous medium. We need to also abandon astronomical time and instead use a local time based on the period of the spin of the molecules that are involved in the process under consideration. And if we are talking about the transformation of electric and magnetic fields, these molecules will be the tiny molecular vortices that comprise the luminiferous medium, **[4], [5], [6], [7], [8], [9].** As such, the speed of light waves will be fixed relative to the luminiferous medium and determined by the circumferential speed of its constituent molecular vortices.

References

[1] Tombe, F.D., ***"The Lorentz Aether Theory"***, (2020)
https://www.researchgate.net/publication/339696770_The_Lorentz_Aether_Theory

[2] Tombe, F.D., ***"Summary Article – Electromagnetism and Optics"***, (2023)
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[3] Tombe, F.D., ***"Atomic Clocks and Gravitational Field Strength"***, (2017)
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[5] Tombe, F.D., ***"The Double Helix and the Electron-Positron Aether"***, (2017)
https://www.researchgate.net/publication/319914395_The_Double_Helix_and_the_Electron-Positron_Aether

[6] Whittaker, E.T., ***"A History of the Theories of Aether and Electricity"***, chapter 4, pp. 100-102, (1910)
"All space, according to the younger Bernoulli, is permeated by a fluid aether, containing an immense number of excessively small whirlpools. The elasticity which the aether appears to possess, and in virtue of which it is able to transmit vibrations, is really due to the presence of these whirlpools; for, owing to centrifugal force, each whirlpool is continually striving to dilate, and so presses against the neighbouring whirlpools."

[7] Clerk-Maxwell, J., ***"On Physical Lines of Force"***, Philosophical Magazine, vol. XXI, Fourth Series, London, (1861)
http://vacuum-physics.com/Maxwell/maxwell_oplf.pdf

[8] Lodge, Sir Oliver, ***"Ether (in physics)"***, Encyclopaedia Britannica, Fourteenth Edition, vol. 8, pp. 751-755, (1937)
See pp. 6-7 in the pdf file in the link below, beginning at the paragraph that starts with, ***Possible Structure.*** −, and note that while the quote suggests that the ether is incompressible, this article suggests otherwise. The quote in question, in relation to the speed of light, reads,
http://gsjournal.net/Science-Journals/Historical%20PapersMechanics%20/%20Electrodynamics/Download/4105

[9] O'Neill, John J., ***"PRODIGAL GENIUS, Biography of Nikola Tesla"***, Long Island, New York, 15th July 1944, Fourth Part, paragraph 23, quoting Tesla from his 1907 paper ***"Man's Greatest Achievement"*** which was published in 1930 in the Milwaukee Sentinel,
"Long ago he (mankind) recognized that all perceptible matter comes from a primary substance, of a tenuity beyond conception, filling all space, the Ākāśa or luminiferous ether, which is acted upon by the life-giving Prana or creative force, calling into existence, in never ending cycles, all things and phenomena. The primary substance, thrown into infinitesimal whirls of prodigious velocity, becomes gross matter; the force subsiding, the motion ceases and matter disappears, reverting to the primary substance."
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