Failure Of Lorentz Transforms For Deep Space Transport at High Speed

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Abstract

Lorentz Transformations of flat space were found to be inappropriate at high speed in deep space transport. Curvature of vacuum stress energy was predicted to accumulate from prolonged acceleration boosting of a space vehicle. Support was found for previous work on modifications of Polarizable Vacuum theory.

Introduction

A previous attempt to extend Polarizable Vacuum theory of Harold Puthoff and others to high speed in deep space failed a test of special relativity for all velocities other than zero. Modification to PV theory was proposed (1) following published work by Niels Bohr in 1949 (2) for extending the theory to high speed in deep space transport vehicles. Planck's constant was allowed to vary slowly in the previous work with stress energy in the vacuum. The modification was used to predict a polarization in the vacuum could arise from high speed of prolonged acceleration, resulting in localized stress energy curvature of space.

Polarizable Vacuum theory has offered an alternative to geometric theories of space time curvature, with some acceptance in the scientific community as a step in the right direction, but not a final theory or replacement for General Relativity. With only one adjustable parameter K to

describe the vacuum response to stress energy, PV theory is the simplest of the large scale cosmologies, and the only one to express relativity in terms of local variables that can be measured locally. As such the PV theory is an attempt to move space science forward with predictions that can be tested experimentally.

In a publication H. E. Puthoff [3] and S. R. Little in 2010 gave a description of PV as it relates to deep space transport, showing that a field effect propulsion generator must be very powerful, requiring technology that is far advanced beyond the present capability of space science on Earth. [4] In principle the parameter ($K < 1$) could arise from a powerful field generator, but as Puthoff pointed out in the referenced article, the power requirements are far beyond the capacity of existing equipment.

In previous work [5] the question was asked about how PV theory could be altered locally by a fast moving deep space transport vehicle. More specifically an attempt was made to extended PV theory with velocity terms sufficient to show the polarization parameter ($K < 1$) arising from the velocity terms. An example was given as the accumulated speed and kinetic energy of a deep space transport vehicle under prolonged acceleration. The accumulated kinetic energy of a deep space transport vehicle was proposed as a substitute for the field effect generator in polarizing space, noting that both types of energy must interact with the local vacuum.

In the present work an alternative method will be developed to extend Lorentz Transformations for high speed to give energy momentum relations without a variation in Planck's constant.

Lorentz Transforms At Normal Conditions

Calculations are based on Lorentz Transformations in standard forms that are invariant in flat space. Further calculation will be done for deep space transport at high speed.

In well-known Time Dilation, a boosted traveler measures shorter time intervals in the boosted frame (prime) than another unboosted observer measures for the same time interval.

1.1) $\Delta t' = \Delta t/\gamma$

1.2) $\gamma^2 = 1/\ (1 - v^2/c^2)$

In equally well-known Length Contraction - the boosted traveler measures longer lengths in the boosted frame (prime) than another unboosted observer measures for the same length.

1.3) $\Delta x' = \gamma \Delta x$

Measurements are selected such that velocity is defined in agreement with the relative boosted velocity.

1.4) $v = \Delta x/\ \Delta t$

1.5) $v' = \Delta x'/\ \Delta t'$

Relative velocity is given.

1.6) $v' = \gamma^2 v$

At High Speed

The question is asked of how well relation (1.6) performs at high speed in deep space where stress energy is predicted to accumulate locally around the boosted vehicle. Close approach to light speed is postulated after prolonged boosting a period of years, introducing the infinity concept and possibly suggesting a limitation of the Lorentz methods caused by loss of flatness. All following measurements are made by the long boosted traveler

where prime is omitted. Notation is made consistent with other articles on Polarizable Vacuum theory.

2.0) $c = \gamma^2 c_o$

The standard equations of energy and momentum apply in which (2.0) completes the set. Planck's constant does not enter into the calculation.

2.1) $E^2 = (mc^2)^2 + (pc)^2$
2.2) $(pc) = E(v/c)$
2.3) $dE = v\, dp$

Solutions are found by substitution and integration. Equations (2.2) and (2.3) are combined, followed by application of (2.1) for reduction of form.

2.4) $dE^2 = c^2\, dp^2$
2.5) $d(mc^2)^2 = -\, p^2\, dc^2$

Energy and momentum are further described by combining (2.1) and (2.2) in standard methods.

2.6) $E^2 = (mc^2)^2/(1-v^2/c^2)$
2.7) $(pc)^2 = (v^2/c^2)(mc^2)^2/(1-v^2/c^2)$

From (2.5) and (2.7) the logarithmic form is achieved and further reduced.

2.8) $dLn[(mc^2)^2/E_o^2] = -\,[(v^2/c^2)/(1-v^2/c^2)]\, dLn(c^2/c_o^2)$
2.9) $dLn[(mc)^2/(m_o c_o)^2] = -\,[1/(1-v^2/c^2)]\, dLn(c^2/c_o^2)$

Integration Of A Prolonged Boost

Integration is done from unboosted to boosted condition near light speed using (2.0) which is postulated to cover the integration range.

3.0) $dLn[(mc)^2/(m_oc_o)^2] = -(c/c_o)\, dLn(c^2/c_o^2)$

3.1) $dLn[(mc)/(m_oc_o)] = -d(c/c_o)$

3.2) $[(mc)/(m_oc_o)] = Exp[1 - (c/c_o)]$

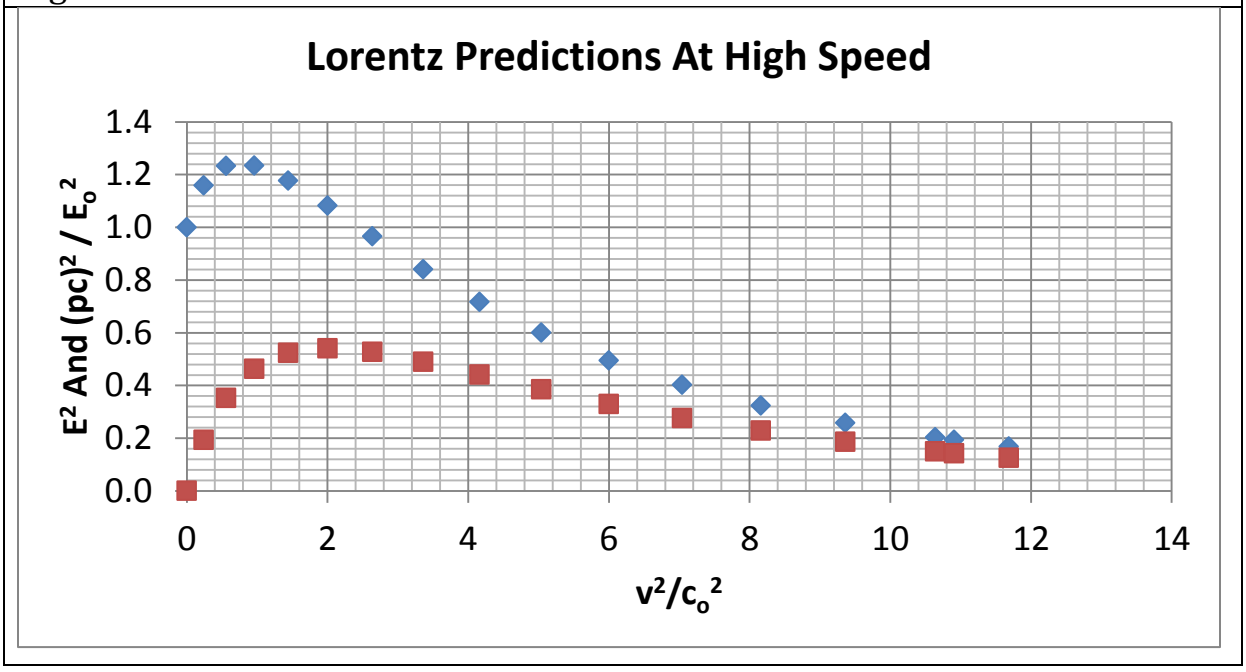
3.3) $[(mc)^2/(m_oc_o)^2]^2 = (c^2/c_o^2)Exp[2\{1 - (c/c_o)\}]$

3.4) $E^2/E_o^2 = \gamma^2 [(mc)^2/(m_oc_o)^2]^2$

Interpretation Of Results

A graphical presentation is helpful to interpret the results. From a tabulation calculated results the energy and momentum are plotted for different speeds.

Figure 1



The Figure 1 shows a virtually impossible result in which energy and momentum reach maximums and then decrease as speed continues to increase. Implication is that space becomes curved from stress energy of continual acceleration and is no longer flat enough to be described by Lorentz Transformations.

Conclusions

In conclusion there is prediction for a polarization of vacuum space arising from velocity of a deep space transport vehicle under prolonged acceleration, in agreement with the previous work.[5]

The conclusion depends on failure of Lorentz Transformations at high speed as found in this article.

Results are suggesting that propulsion of a deep space vehicle will become less of a limitation than human factors and design parameters.

Limitations and Future Work

Certainly there are other ways to postulate polarization of the vacuum. Only experimental evidence can identify the correct method. A large number of other possible assumptions lead to predictions of very similar results to these.

Special relativity has been stretched rather far for making prediction of stress energy curvature, but with special circumstances where symmetries apply to a single source locally in the context of nearly flat space. The benefit is a result that is understandable to a large audience.

Advances in propulsion are needed, possibly a combination of stress energy field effect with magnetic field generators.

Acknowledgements

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Recognition is given to Ulla Mattfolk of Finland for help in developing the theories and recognizing the biological questions about limitations for living organisms to function at the level of micro physics during high speed travel in space that is over saturated with kinetic energy.

Reference Notes

1) Interpretation of the limit { $dE/df = \hbar$ } as referenced in previous work was not endorsed by Bohr, Einstein, Heisenberg, or Planck. It made a reasonable extension of existing science in a situation where a function something like this was needed to modify PV theory. It was published for the first time by this author in viXra: 1511.0085 v1 on 9 November 2015.

2) The reference to Niels Bohr is found in the 2010 Dover reprint ATOMIC PHYSICS AND HUMAN KNOWLEDGE, first published in 1961 by Science Editions in New York, shortly before Bohr died. The speech of 1949 was first published in 1949 in Contribution to ALBERT EINSTEIN: PHILOSOPHER SCIENTIST, Library of Living Philosophers, volume 7, starting on page 199. The quoted reference was to page 44 of the Dover edition for a relation of time interval to frequency interval.

3) puthoff@earthtech.org

4) http://arxiv.org/ftp/arxiv/papers/1012/1012.5264.pdf

5) http://vixra.org/abs/1511.0085