Deep Space Transport With Field Effect Of Vacuum Stress Energy

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Abstract

Stress energy of general relativity is developed from interference patterns of electromagnetic waves where all of the electric and magnetic components are canceled out, but the Poynting vectors are not canceled.

Curved space in the vicinity of the transport vehicle is shown to be equivalent to an induced gravitational field off set from the center of mass in the vehicle.

A proposal is made that high acceleration can be achieved by field effect gravitational free fall in deep space transport removing traditional limits on acceleration for the vehicle and crew.

Introduction

Field effect propulsion has long been recognized as one of the best chances for developing deep space transport with any reasonable economy. In nearby space electromagnetic propulsion has been used effectively for decades changing the orbits of space vehicles, but most often in association with plasma or other ionized mass. In this article the possibility for field effect without accelerated ions will be explored in light of previous science, and reasonable extensions of technology.

Electromagnetic energy has been demonstrated to give propulsion without mass expelled, but with momentum of radio waves directed backward from the vehicle, producing a very small reaction force for a large power supply. The conclusion was made that light speed of the radio wave made the efficiency low when mass was not expelled.

Of the four forces in physics, only gravity and electromagnetic forces are found to operate at long range and on any scale larger than an atom. An argument will be made that when energy is flowing into space with no electric or magnetic components the field produced is gravitational because there is no other recognized force to carry the power.

Previous work by H. E. Puthoff [1] was published in a 1998 patent for information transmitted through a curl free potential field where electric and magnetic components had been canceled out by interference, and the resulting potential field passed through shields and barriers to a detector. The patent was opposed, but eventually upheld by a board of appeals. It became a celebrated case in the study of patent law.[2] "The lesson of the Puthoff patent is that in a world where both types of patents are more and more common, even a competent examiner may fail to distinguish innovation from pseudoscience." All of the patent claims were found to be valid, but too far advanced in science for most people to evaluate correctly.

Before Puthoff's patent on curl free potential, an unrelated inventor Raymond C. Gelinas[3] working for Honeywell received 11 patents in six years 1980 to 1986 using the same principles as Puthoff' patent, but with different claims for different inventions. These Patents were not disputed, like the Puthoff patent. The result is an established science where electromagnetic power produces force fields that are not electromagnetic, and can pass through nearly any barrier except a special type of superconducting bimetallic detector.

A long history is associated with various other writers for gravity induction and interference patterns, giving conclusions that there is a possibility of new technology, but suggestions of weak fields and low efficiency. In this article new technology will be described with comments about field strength and power requirements.

This article takes the opinion that the physical laws and constants reside in the vacuum, because they are nearly the same almost everywhere. Energy in the vacuum is fully committed for enforcing the laws, and cannot be taken for other purposes except as a short term loan governed by Heisenberg Uncertainty.

Propulsion Force with or Without Mass Ejected

A well-known relation exists between force F and P power at light velocity c.

1.1) $F = P / c$ or one newton of force per 300 megawatts

Radio wave thrusters are not used because other technologies are more economical. A lower velocity would improve the efficiency, suggesting that a mass or virtual mass could be ejected. Stress energy in General Relativity is recognized to modify a gravity field by equivalent mass of stress energy.

1.2) $E = m c^2$

1.3) $dm/dt = P / c^2$ or one kg/second of mass per $9 * 10^{16}$ watts

These relations show a well-known technology that is not practical for deep space transport. Some improvement is possible by realizing that electrons have a small mass and are nearly always available for acceleration and ejection, leaving some part of the vehicle with a net positive electric charge that represents reverse curvature. The implication is a force repelling mass in General Relativity[4] by inducing a virtual antimass equivalent m_r for charge q at distance r and gravity constant G.

1.4) $m_r = - q^2 (k/r)(c^2/2G)$

In Reissner–Nordström metric k is usually given.

1.5) $k = G / (4\pi\varepsilon_0 c^4)$

1.6) $m_r = - q^2 / (8\pi\varepsilon_0 c^2 r)$ for Coulomb force constant $1/4\pi\varepsilon_0$

In gravity fields near planets and stars reverse curvature offers a double benefit of electrons accelerated to relativistic energies and ejected from the vehicle for thrust, combined with a predicted repulsive force between the local gravity field and the positively charged space vehicle.

Deeper in space the rapidly moving positive charge generates a magnetic field according to the right hand rule. A beam of electrons ejected from the back of the vehicle generates another magnetic field of opposite polarity. Where the two fields meet the magnetic components are canceled out in a region known

as a Bloch wall, which has been proposed by other writers as stress energy with no electric or magnetic components, suggesting induced gravity.

Reverse curvature in space represents the negative energy in certain theories of warp fields that are not covered in this article. In general if a long rapidly moving vehicle is charged strongly positive on the front end and ejects high speed negative electric charges on the back end, with vehicle rotation about the main axis or other stabilization to avoid tumbling, then the hypothetical warp field of Puthoff and others is realized in the design.

A better propulsion device for deep space transport may be developed from energy borrowed from the vacuum as governed by Heisenberg Uncertainty. Then any amount of energy can be borrowed and used as acceleration mass, but only for a brief moment, and only if equipment is developed that can achieve the collection and acceleration. Momentum is conserved.

1.7) $(\Delta E)(\Delta t) \leq \hbar$

1.8) $(\Delta m) \leq \hbar / [\, c^2 (\Delta t)\,]$

Published research by others has shown that the vacuum randomly produces particle pairs, mostly electrons and positrons of 0.512 Mev each. CODATA [5] gives $\hbar$ { $6.582 * 10^{-16}$ electron volt * seconds }.

1.9) $(\Delta t) \leq (6.582 * 10^{-16}$ ev*s)/(2* 512,000 ev)

or $6.427*10^{-22}$ seconds

One possible use for such a short time interval would be in a high speed accelerator taking advantage of time dilation to further accelerate the virtual particles that are becoming real. These components are developed by other researchers under the name quantum vacuum thrusters and are not described further in this article. Various technologies can be applied to increase the number of particles by stressing a volume of enclosed space.

The present interest is in advanced propulsion for deep space transport taking advantage of the properties in interference patterns of radio waves, produced by combinations of emitters and reflectors. A plane polarized radio wave may be created in a Cartesian system **i**, **j**, **k** using an AC power source and propagating in the z direction. The electric field vector $\mathbf{E}_1$ in the x direction can be described by a sine function.

2.1) $\mathbf{E}_1 = E_o \text{ sine } [(2\pi/\lambda)(z - c*t)]\ \mathbf{i}$

A magnetic field vector $\mathbf{B}_1$ is also created in the y direction.

2.2) $\mathbf{B}_1 = B_o \text{ sine } [(2\pi/\lambda)(z - c*t)]\ \mathbf{j}$

The amplitudes are related in vacuum space.

2.3) $E_0 = c * B_0$

The resulting Poynting vector in the z direction is a cross product with the field strength $\mathbf{H}_1$ representing power flow for a given cross section area.

2.4) $\mathbf{S}_1 = \mathbf{E}_1 \text{ X } \mathbf{H}_1$ where $\mathbf{H}_1 = \mathbf{B}_1 / \mu$

2.5) $\mathbf{S}_1 = (E_0B_0/\mu) \text{ sine}^2 [(2\pi/\lambda)(z - c*t)]\ \mathbf{k}$

The interference pattern is produced by generating a second radio wave identical to the first, traveling in the same direction, except with phase difference of a quarter wave length.

2.6) $\mathbf{E}_2 = E_o \text{ cosine } [(2\pi/\lambda)(z - c*t)]\ \mathbf{i}$

2.7) $\mathbf{B}_2 = B_o \text{ cosine } [(2\pi/\lambda)(z - c*t)]\ \mathbf{j}$

2.8) $\mathbf{S}_2 = \mathbf{E}_2 \text{ X } \mathbf{H}_2$

2.9) $\mathbf{S}_2 = (E_0B_0/\mu) \text{ cosine}^2 [(2\pi/\lambda)(z - c*t)]\ \mathbf{k}$

When the two radio waves are superimposed on the same path the power flow continues as the components are added together.

2.10) $\mathbf{S}_1 + \mathbf{S}_2 = (E_0B_0/\mu)\,\mathbf{k} = \mathbf{S}_{1,2}$

The AC character is lost, but replaced by a DC character where power is only controlled by the amplitudes and direction. The power is still flowing as electromagnetic energy, and the AC character can be recovered at some distant place if the two radio waves differ very slightly in wave lengths.

To induce a stress energy like gravity a second pair of radio waves would be required like the first pair but out of phase by one half wave length, causing the electromagnetic character to be lost and replaced by gravitational character.

2.11) $\mathbf{E}_3 = E_o \text{ sine } [\pi + (2\pi/\lambda)(z - c*t)]\ \mathbf{i}$

2.12) $\mathbf{B}_3 = B_o \text{ sine } [\pi + (2\pi/\lambda)(z - c*t)]\ \mathbf{j}$

2.13) $\mathbf{S}_3 = (E_0B_0/\mu) \text{ sine}^2 [\pi + (2\pi/\lambda)(z - c*t)]\ \mathbf{k}$

2.14) $\mathbf{E}_4 = E_o \text{ cosine } [\pi + (2\pi/\lambda)(z - c*t)]\ \mathbf{i}$

2.15) $\mathbf{B}_4 = B_o \text{ cosine } [\pi + (2\pi/\lambda)(z - c*t)]\ \mathbf{j}$

2.16) $\mathbf{S}_4 = (E_0B_0/\mu) \text{ cosine}^2 [\pi + (2\pi/\lambda)(z - c*t)]\ \mathbf{k}$

When the third and fourth radio waves are superimposed on the same path the electromagnetic power flow continues as the components are added together.

2.17) $\mathbf{S}_3 + \mathbf{S}_4 = (E_0B_0/\mu)\,\mathbf{k} = \mathbf{S}_{3,4}$

A final construction in this series occurs when the four radio waves are traveling on the same path and (2.3) is used.

2.18) $\mathbf{S} = 2(B_0^2c/\mu)\,\mathbf{k}$

The result is a step function of energy resembling gravity traveling at light speed in the z direction, with a quadrupole moment and quantum spin of 2. Intensity is controlled only by the magnitude of the magnetic vector sources.

It can be compared to a curl free magnetic vector potential with no electric or magnetic vector components. The curl free wave can pass through almost any barrier, but may be decomposed into its component parts at a distant place by constructing tiny differences in the wavelengths of the four sources.

The form of (2.18) seems to allow the field to be composed in part or whole of permanent magnets, and other writers have made claims of that type. It raises the possibility that some part of the gravitating energy can be borrowed from the vacuum by use of permanent magnets. In this context Heisenberg Uncertainty governs the exchange of energy quanta with the vacuum.

All that remains is to postulate a local gravity field induced in the vicinity of a deep space transport vehicle, displaced forward from the center of mass, and to evaluate the field strength required to generate an efficient thrust in a system where momentum is conserved.

At low speed in nearly flat space a locally induced acceleration is predicted of the gravitational type g.

2.19) $g^2 = 4\pi G S / c$

Using Earth standard gravity, the Poynting amplitude is computed.

2.20) $S = 3.414 * 10^{19}$ watts/ square meter

This exercise demonstrates the high power required to affect a field effect of induced gravity. From (2.18) the equivalent magnetic field is calculated, remembering that electric field is measured in volts per meter and permeability is measured in newtons per amp squared to simplify the units of the magnetic field. Also **k** has a dimensionless magnitude of one in the z direction.

2.21) $B_0 = 268.3$ volt sec / meter^2 near flat space

The magnetic field is achievable with reasonable equipment, although the equivalent electric field would probably not be possible except by induction. Also the AC power supply is probably not achievable, although the DC character of the interference pattern probably is.

The Poynting vector must be directional backward of the transport vehicle to conserve momentum during thrust, suggesting the radio wave sources should operate directionally or with reflectors in front of them. Behind the vehicle some sort of energy disturbance in the vacuum seems likely.

Poynting vectors predict some remarkable things that have not been disproven, but are held in doubt by many scientists. In this example the prediction is that part of the power for propulsion can be borrowed from the vacuum if part of the generating field is provided by permanent magnets. Heisenberg Uncertainty governs exchange of energy with the vacuum, and finds some way to collect the loan when the allowed time has elapsed. On Earth the result is unpredictable if a non-random process is operated to prevent the repayment. In deep space the predicted result is a displacement in time or space.

High speed in deep space alters the vacuum, causing the power and field strengths to be recalculated. Two theories are used to demonstrate a possible revision in deep space transport vehicles. Polarizable Vacuum theory of Puthoff and others as modified in a previous article is combined with Vacuum Partition theory of this author which is needed to put a finite limit on the vacuum energy potential. A result is given with the lengthy derivation deferred to a future article.

2.22) $B_0 = 3.423$ volt sec / meter^2 near a worm hole

The theories predict that the field becomes easier to generate in deep space transport vehicles at high speed and could create disaster for the vehicle and crew if the field effect is not shut down promptly when the worm hole is opening around it.

The gravity induction field places no limitations on acceleration for the vehicle or crew, which shortens the time projected for deep space transport, and makes the vehicle more maneuverable at high speed.

Conclusions

In conclusion there is prediction for break through propulsion technology in deep space transport vehicles, derived from interference patterns of magnetic fields. Results suggest part of the energy can be borrowed from the vacuum as governed by Heisenberg Uncertainty when using permanent magnets to generate part of the field.

Other technologies can be combined with the field effect propulsion and are probably necessary part of the time.

One technology that combines well with the field effect is the acceleration of electrons and other negative ions, leaving the vehicle positively charged and generating part of the magnetic field by high velocity movement of the positive charge.

Stress energy of a strong positive electric charge is predicted by General Relativity to warp space in ways similar to those suggested by other writers.

Limitations and Future Work

Certainly there are other ways to postulate break through propulsion. Only experimental evidence can identify the best technologies.

A more elaborate representation is possible with tensors replacing vectors. The present treatment is understandable to a large audience.

The most useful continuation of this work would be to make a detailed design of vehicles that can be operated in the solar system, but at speeds high enough to test the theories and equipment.

Vacuum Partition has been published in part but is not widely known or accepted. Additional articles are planned to show more details of the derivations. The theory offers a way to bring agreement between General Relativity and Quantum Field theory by partitioning the vacuum energy into different types that curve space positively or negatively.

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Reference Notes

1) Harold Puthoff; Patent US 5,845,220 European Patent Office, US Patent Office, Retrieved 7 December 2015.

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3) "Raymond Gelinas Patents"; European Patent Office, US Patent Office, Retrieved 7 December 2015.

4) Peter Bergmann; Introduction to the Theory Of Relativity, Dover, New York, 1976. Page 206.

5) CODATA; http://physics.nist.gov/cgi-bin/cuu/Value?hbarev , Retrieved 7 December 2015.