

EmDRIVE

EmDRIVE has been recently chosen by a certain prominent company as major interplanetary propulsion for all her future spacecrafts. This is a novel concept violating basic physical laws; in this particular case the Law of Pulse Conservation is smashed.

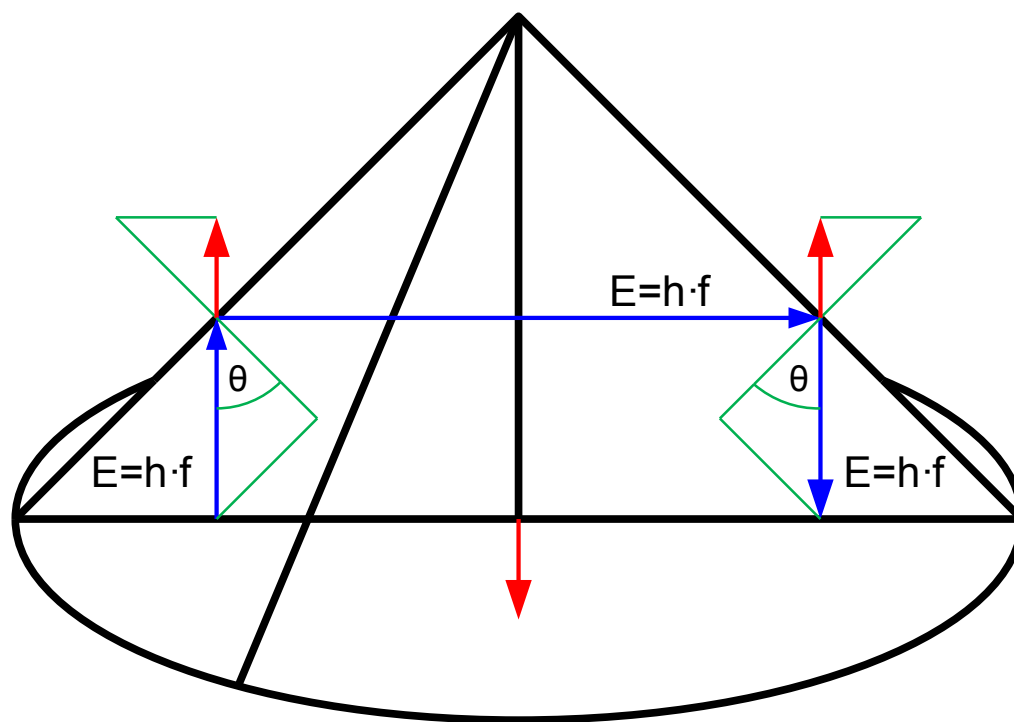
The operation of EmDRIVE is based on experimentally proven fact that microwave radiation injected into the reflective cone produces asymmetrical forces contrary to basic Law of Pulse Conservation, simultaneously violating Law of Energy Conservation too, the physics behind the effect is not described anywhere else except in this particular paper of mine, including in the patent application too that really challenge validity of this particular patent application.

We should bear in mind that any single patent cannot be issued without plausible modus operandi of the device that should be patented and therefore in this very paper is presented one compelling and plausible explanation of the effect that should facilitate patenting of this magnificent device a lot.

MODUS OPERANDI OF EmDRIVE

The difference in forces occurs due to difference in Longitudinal Relativistic Doppler Effect and Transversal Relativistic Doppler effect. On the flat side of cone only longitudinal effect occurs while on the curved side both Longitudinal and Transversal ones simultaneously occur. Total pulse variation is proportional to the difference of photonic pulses prior and after bouncing of moving reflective barrier, i.e. cone sides in this particular case:

Fig. 1



Force is variation of the pulse in the time, i.e. it is time derivative of linear momentum:

$$\vec{F} = \frac{d\vec{P}}{dt} = \frac{W}{c} \cdot \hat{d} = 2 \cdot \frac{dN}{dt} \cdot \frac{h \cdot f}{c} \cdot \hat{d} \quad (1)$$

Whereas dN/dt is number of photons bouncing from the barrier, further:

$$F = \left| \frac{d\vec{P}}{dt} \right| = \frac{dN}{dt} \cdot \frac{h \cdot f}{c} \cdot \left(1 + \left(1 - \frac{v}{c} \right)^2 \right) \approx 2 \cdot \frac{dN}{dt} \cdot \frac{h \cdot f}{c} \quad (2)$$

We can see that projection of upward force to the cone is:

$$F = 2 \cdot \frac{dN}{dt} \cdot \frac{h \cdot f}{c} \cdot \cos(\theta)^2 \quad (3)$$

A cone with angle of 45° creates upward photonic force that is halved initial one; therefore photon's reactive force acting to the upper surface is half of the force acting to lower one while lateral forces are annulled due to the cone's symmetry. This deviation from the trivial solution is originated in the fact that ratio between the pulse and the energy is not linear but constant on the luminal velocities.

Pertinent question here is: what is the best shape of the cone to provide maximal downward force and this answer requires profound understanding of the subject for correct answer: as there is only one path of the quickest falling down, there is only one cross section of the air wing for the maximal lift, there is only one shape of the propeller blade for maximal thrust and also only one shape of rocket nozzle and combustion chamber for the maximal rocket thrust, similarly there is only one optimal shape of the cone for maximal thrust of the EmDRIVE too and this particular shape is an industrial fortune, currently beyond the scope of this modest paper with aim to briefly explain quality, not quantity of the phenomenon. The cone aforementioned with 90° between slopes with flat bottom is just chosen for the simplest analysis of the essence of this phenomenon in this thought experiment. All inquires about optimal shape please should be sent to the addresses listed below this text.

The crux of the phenomenon is the fact that all forces are obtained by photons having connection between pulse and energy constant while in the case of low speed this connection is linear depending on the velocity ($E = \frac{1}{2} \cdot P \cdot v$). The connection between the pulse and the energy of the photon is:

$$P = \frac{E}{c} = \frac{h}{c} \cdot f \quad (4)$$

Total energy of the particle is:

$$E_{\text{tot}} = \frac{m_0 \cdot c^2}{\sqrt{1 - \frac{\vec{v}^2}{c^2}}} \quad (5)$$

Total pulse of the particle is:

$$\vec{P} = \frac{m_0 \cdot \vec{v}}{\sqrt{1 - \frac{\vec{v}^2}{c^2}}} \quad (6)$$

Fermionic parameter k is ratio between total energy and multiplication of pulse and velocity:

$$k = \frac{E_{\text{tot}}}{\vec{P} \cdot \vec{v}} \quad (7)$$

Kinetic energy of the particle is:

$$E_k = E_{\text{tot}} - E_0 = m_0 \cdot c^2 \cdot \left(\frac{1}{\sqrt{1 - \frac{\vec{v}^2}{c^2}}} - 1 \right) = m_0 \cdot c^2 \cdot \frac{1 - \gamma}{\gamma} \approx \frac{m \cdot \vec{v}^2}{2} \quad (8)$$

Then, fermionic parameter k is going to be:

$$k = \frac{E_k}{\vec{P} \cdot \vec{v}} = \frac{1}{1 + \sqrt{1 - \frac{\vec{v}^2}{c^2}}} = \frac{c}{c + \sqrt{c^2 - \vec{v}^2}} = \frac{1}{1 + \sqrt{1 - \beta^2}} = \frac{1}{1 + \gamma} \quad (9)$$

Spin of fermions is 0.5 while for most of bosons it is 1. It is always an integer value for all bosons. For low speeds k is 0.5 while at high speeds including c it is 1, conveniently matching the spins of both fermions and bosons in accordance with their speed, $k(v)$ graphic is:

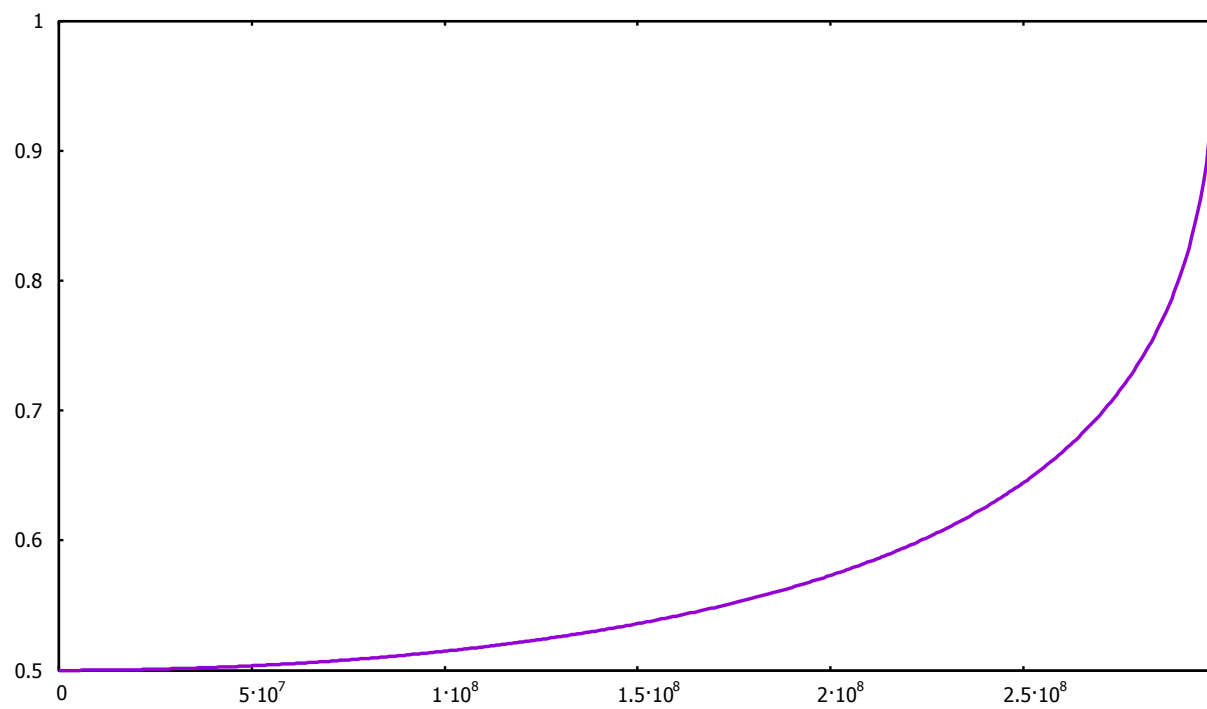


Fig. 2

Above graphics clearly denotes that particles running at light speed or near light speed are always bosons with the spin equal to one.

Another useful parameter is n representing approximate connection between power of velocity in kinetic energy formula:

$$E_k = m_0 \cdot c^2 \cdot \left(\frac{1}{\sqrt{1 - \left(\frac{\vec{v}_{0,k}}{c} \right)^2}} - 1 \right) \approx k \cdot m_0 \cdot v_{0,k}^n \quad (10)$$

Above equation should be differentiated too equalized to obtain system of smooth equations and then n is obtained as:

$$n = \frac{1 + \sqrt{1 - \frac{v^2}{c^2}}}{1 - \frac{v^2}{c^2}} = \frac{1 + \sqrt{1 - \beta^2}}{1 - \beta^2} = \frac{1}{\gamma^2} + \frac{1}{\gamma} = \frac{k}{(1-k)^2} \quad (11)$$

As n diverges for $v = c$ then we will rather choose p parameter as reciprocal n parameter for graphic:

$$E_k \approx k \cdot m_0 \cdot v_{0,k}^n = k \cdot m_0 \cdot v_{0,k}^{\frac{1}{p}} = \frac{m_0 \cdot v_{0,k}^{\frac{1}{p}}}{\left(1 + \frac{1 + \sqrt{1 + 4 \cdot n}}{2 \cdot n} \right)} \quad (12)$$

$\Rightarrow$

$$p = \frac{1}{n} = \frac{1 - \frac{v^2}{c^2}}{1 + \sqrt{1 - \frac{v^2}{c^2}}} = \frac{1 - \beta^2}{1 + \sqrt{1 - \beta^2}} = \frac{\gamma^2}{1 + \gamma} = \frac{(1-k)^2}{k} \quad (13)$$

Graphic $p(\beta)$ is:

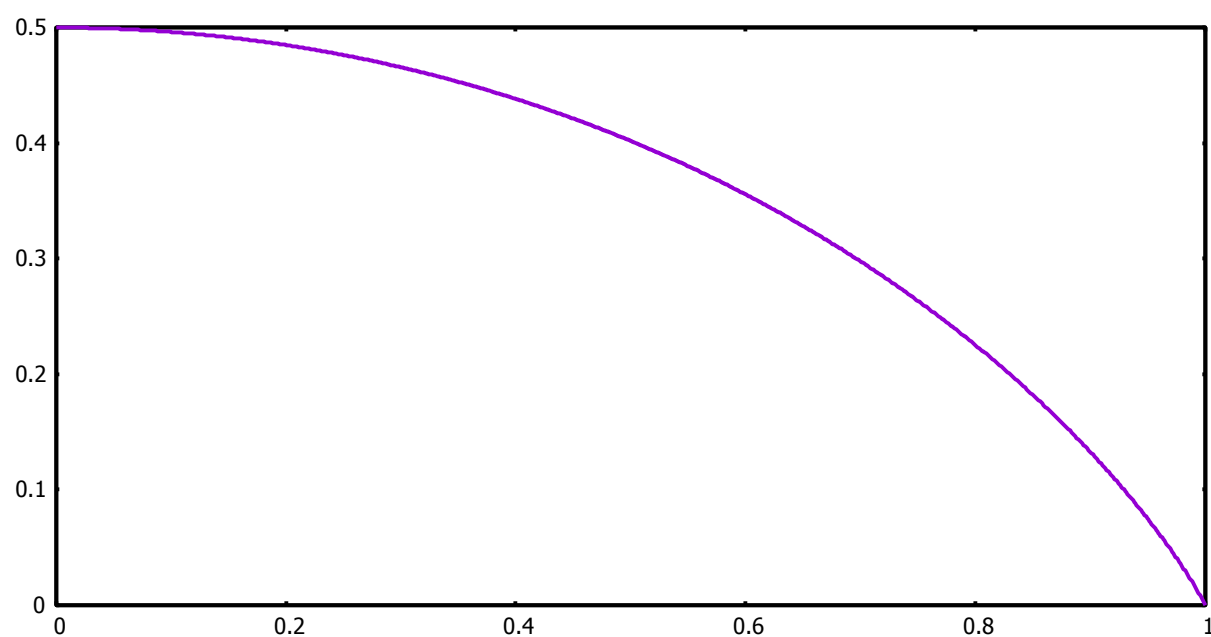


Fig. 3

We have just faced enigma called Einstein formula of photo effect ($E=h \cdot f$) that sheds a new light to the Plank's h constant:

$$\lim_{v_{0,k} \rightarrow c} E_k = \lim_{v_{0,k} \rightarrow c} m_0 \cdot c^2 \cdot \left(\frac{1}{\sqrt{1 - \left(\frac{\vec{v}_{0,k}}{c} \right)^2}} - 1 \right) = \lim_{v_{0,k} \rightarrow c} \frac{m_0 \cdot v_{0,k}^n}{k} = h \cdot f \quad (14)$$

Frequency of the photon is going to be:

$$f = \lim_{v_{0,k} \rightarrow c} \frac{m_0 \cdot c^2}{h} \cdot \left(\frac{1}{\sqrt{1 - \left(\frac{c + v}{c} \right)^2}} - 1 \right) \quad (15)$$

This dare equation implies that there is a variety of energies even on light speed and that only slight variation v determine true energy of the weightless particles.

This is just an audacious hypothesis claiming that photons of higher energies are running slightly faster, which is not necessarily correct statement, with analysis beyond the scope of this paper. According that, the explosions of supernovas should be seen firstly in UV spectrum and then in IR one and the delay between these two spectrums could be utilized for correct determination of the distant between the observer and just exploded supernova.

Anyway, main argument against this hypothesis is that light speed world is also a timeless place too and therefore this variation can be obtained through slight variation of already very slow time passing rather than variation of speed of the photons themselves. In that case there is no chromatic aberration in the vacuum caused solely by the distance itself, but would occur drop of frequency of remote source, just as actually noticed.

THE FORCE AFFECTED BY ACCELERATION

Acceleration causes apparent velocity of the emitter attached to the craft and the reflective barriers affecting thrust via Doppler's effect.

Longitudinal Doppler's effect is effect where the receiver is approaching to the source and vice versa, i.e. their trajectories are mutually parallel:

$$f_1 = f_0 \cdot \sqrt{\frac{1 - \frac{v_{1,0}}{c}}{1 + \frac{v_{1,0}}{c}}} = f_0 \cdot \sqrt{\frac{1 - \beta}{1 + \beta}} \approx f_0 \cdot \left(1 - \frac{v}{c} \right) \approx f_0 \cdot (1 - \beta) \quad (16)$$

Transversal Doppler's effect is effect where the trajectory of the receiver mismatches trajectory of the source, i.e. their trajectories are mutually perpendicular:

$$f_1 = f_0 \cdot \sqrt{1 - \frac{v_{1,0}^2}{c^2}} = f_0 \cdot \sqrt{1 - \beta^2} \quad (17)$$

Mixed formula able handling both cases is:

$$f_1 = f_0 \cdot \frac{\sqrt{1 - \frac{v_{1,0}^2}{c^2}}}{1 + \frac{v_{1,0}}{c} \cdot \cos(\theta)} = f_0 \cdot \frac{\sqrt{1 - \beta^2}}{1 + \beta \cdot \cos(\theta)} \quad (18)$$

Whereas θ is angle between trajectories of emitter and receiver, f_0 is frequency of emission, f_1 is frequency of reception and $v_{1,0}$ is speed between source and emitter.

For case of 45° of slope the following formula emerges:

$$f_1 = f_0 \cdot \frac{\sqrt{1 - \frac{v_{1,0}^2}{c^2}}}{1 + \frac{v_{1,0}}{c} \cdot \cos(45^\circ)} = f_0 \cdot \frac{\sqrt{1 - \left(\frac{v_{1,0}}{c}\right)^2}}{\sqrt{\left(1 + \frac{v_{1,0}}{c \cdot \sqrt{2}}\right)^2}} \quad (19)$$

Force cause by the photon bouncing from the interior of the reflective cone with 90° angle is:

$$F = \frac{dP_2}{dt} - \frac{dP_1}{dt} = \frac{dN}{dt} \cdot \frac{h \cdot \delta f}{c} \cdot \cos(\theta) = \frac{dN}{dt} \cdot \frac{h \cdot f_0}{c} \cdot \left(1 + \frac{\sqrt{1 - \frac{v_{1,0}^2}{c^2}}}{1 + \frac{v_{1,0}}{c} \cdot \cos(\theta)} \cdot \cos(\theta) \right) \quad (20)$$

$\Rightarrow$

$$F = \frac{dN}{dt} \cdot \frac{h \cdot f_0}{c \cdot \sqrt{2}} \cdot \left(1 + \frac{\sqrt{1 - \frac{v_{1,0}^2}{c^2}}}{1 + \frac{v_{1,0}}{c \cdot \sqrt{2}}} \right) = \frac{dN}{dt} \cdot h \cdot f_0 \cdot \left(1 + \frac{\sqrt{c^2 - v_{1,0}^2}}{c \cdot \sqrt{2} + v_{1,0}} \right) \quad (21)$$

There are two bouncing spots, one on the cone and one on the base, then the total difference is:

$$F = \frac{dN}{dt} \cdot h \cdot f_0 \cdot \left(1 + 1 - \left(\frac{\sqrt{c^2 - v_{1,0}^2}}{c \cdot \sqrt{2} + v_{1,0}} \right) - \left(\frac{\sqrt{c^2 - v_{1,0}^2}}{c \cdot \sqrt{2} + v_{1,0}} \right)^2 - \left(\frac{\sqrt{c^2 - v_{1,0}^2}}{c \cdot \sqrt{2} + v_{1,0}} \right)^2 \cdot \sqrt{\frac{1 - \frac{v_{1,0}}{c}}{1 + \frac{v_{1,0}}{c}}} \right) \quad (22)$$

Above formula after simplification:

$$F = \frac{dN}{dt} \cdot h \cdot f_0 \cdot \left(2 - \left(\frac{\sqrt{c^2 - v_{1,0}^2}}{c \cdot \sqrt{2} + v_{1,0}} \right) - \left(\frac{\sqrt{c^2 - v_{1,0}^2}}{c \cdot \sqrt{2} + v_{1,0}} \right)^2 \left(1 + \sqrt{\frac{1 - \frac{v_{1,0}}{c}}{1 + \frac{v_{1,0}}{c}}} \right) \right) \quad (23)$$

This is difference between initial pulse of photons emission and pulses of three following bouncing, two from the cone and one from the base and this difference makes the non Newtonian propulsion force of the EmDRIVE.

Final formula for the force of EmDRIVE is:

$$F = W \cdot \left(2 - \left(\frac{\sqrt{c^2 - v^2}}{c \cdot \sqrt{2} - v} \right) \cdot \left(1 + \left(\frac{\sqrt{c^2 - v^2}}{c \cdot \sqrt{2} - v} \right) \cdot \left(1 + \sqrt{\frac{1 + \frac{v}{c}}{1 - \frac{v}{c}}} \right) \right) \right) \quad (24)$$

Velocity is obtained through the total cyclic path of the photon:

$$v = a \cdot t = \frac{a \cdot \ell}{v_{\text{craft}}} \quad (25)$$

⇒

$$F = W \cdot \left(2 - \left(\frac{\sqrt{c^2 - \left(\frac{a \cdot \ell}{v_{\text{craft}}} \right)^2}}{c \cdot \sqrt{2} - \frac{a \cdot \ell}{v_{\text{craft}}}} \right) \cdot \left(1 + \left(\frac{\sqrt{c^2 - \left(\frac{a \cdot \ell}{v_{\text{craft}}} \right)^2}}{c \cdot \sqrt{2} - \frac{a \cdot \ell}{v_{\text{craft}}}} \right) \cdot \left(1 + \sqrt{\frac{1 + \frac{\frac{a \cdot \ell}{v_{\text{craft}}}}{c}}{1 - \frac{\frac{a \cdot \ell}{v_{\text{craft}}}}{c}}} \right) \right) \right) \quad (26)$$

Whereas W is power of microwave radiation and v is the speed in respect to the source of inertia whatever it is.

THE ESSENCE OF THE EFFECT

The essence of the phenomenon is originated in the fact that kinetic energy is proportional to the square of velocity on small speeds and constant on high speeds violating physical laws of conservation for both energies and pulses.

The well known Action-Reaction paradox spoils classical electromagnetism standing that Ampere force is not equal on both its ends which is originated in the fact that magnetism is duly relativistic or Doppler alteration of Coulomb fields of the particles.

It is interesting that many authors falsely tried to prove that Action-Reaction paradox is just an illusion, i.e. an infinitesimal paradox occurring prior the integration

only, usually simultaneously showing that various electromagnetic force formulas of various authors yield identical results, which is not true at all, as their appliance on pair of rectangular parallel coils yields explicit symbolic equations quite obviously different ones.

Well known formula for Ampere's force between two infinitesimal current elements is:

$$d^2\vec{F}_{1,2} = \frac{\mu \cdot I_1 \cdot I_2 \cdot \left(3 \cdot ((\vec{r}_2 - \vec{r}_1) \cdot d\vec{r}_1) \cdot ((\vec{r}_2 - \vec{r}_1) \cdot d\vec{r}_2) - 2 \cdot (\vec{r}_2 - \vec{r}_1)^2 \cdot (d\vec{r}_1 \cdot d\vec{r}_2) \right) \cdot (\vec{r}_2 - \vec{r}_1)}{4 \cdot \pi \cdot |\vec{r}_2 - \vec{r}_1|^5} \quad (27)$$

It is obvious that $dF_{1,2}$ is not equal to $dF_{2,1}$ which is direct violation of very basic Newton's Action-Reaction Law standing that force must be equal on its both ends, which is known as Action-Reaction paradox of classical electromagnetism.

The flaw of the Einstein Theory is that he stand that electromagnetic formulas can be applied to the mechanics which seems not to be the case as the inertia of charges is moderated by adjacent charges while inertia of the masses is global variable less influential by adjacent masses and mainly determined by some unknown source of external elusive potential providing inertial properties.

I have derived following formula of the inertia for both masses and charges:

$$\vec{F}_{\text{inertial}} = \frac{V_{\text{external}} \cdot \vec{a}}{c^2} \cdot Q = \frac{V_{\text{external}} \cdot \vec{a}}{c^2} \cdot m \quad (28)$$

The major question concerning absoluteness of relativity is inertial force and centrifugal force, i.e. references for their computation: in respect to what we are measuring acceleration in the Newtonian force of inertia and in respect to what we are measuring angular velocity for centrifugal force:

$$\vec{F}_{1,2} = m_1 \cdot \vec{a}_{1,2} \quad (29)$$

And:

$$\vec{F}_{1,2} = m_1 \cdot \vec{\omega}_{1,2}^2 \cdot \vec{r} \quad (30)$$

There is obvious Petitio Principi logical error in the definition of Inertial Frame: Inertial Frame is going to be a frame without inertial force, either linear or angular one. So, we are measuring acceleration in respect to the frame without acceleration embodied either in the inertial or centrifugal force avoiding explanation in respect to what we are measuring either acceleration or angular velocity. More precisely: where is located the another end of the inertial force and in respect to what is measured angular velocity in formula for centrifugal force or acceleration in Newton's inertial formula?

My own humble explanation is that on the beginning of time there were only two black holes in entire universe, one filled with matter and another one filled with anti matter, and that one filled with matter exploded creating entire universe while another one remained unexploded. This remaining one provides inertia to all masses in universe by pervading them with its own gravitational potential and also causing Hubble expansion. This explanation may not be the correct one as the vacuum itself might be source of inertia as it is consisted of the annulled electrons and positrons,

all in accordance with Dirac theory of vacuum, which further implies that vacuum may have its own mass density with its own gravitational potential fully capable to create inertia to all masses occupying it, but there are some very basic mathematical problems (e.g. Gauss Law) ruining this particular hypothesis simultaneously favoring my own one.

This EmDRIVE clearly proves that M hypothesis is the only valid one also disputing N hypothesis. M hypothesis assumes that physical fields have their own velocities identical to the velocities of their sources while N hypothesis stands that physical fields do not have defined velocities and that only their intensities spatially vary through time. The difference between these two concepts is embodied in the usage of total time and spatial derivatives in case of M hypothesis while N hypothesis utilizes partial time and spatial derivatives preventing time derivation to reach coordinates creating velocities as such velocities apparently do not exist within N hypothesis.

Theory of Relativity faces serious issues here mainly related to the incorrect treatment of the energy exchange between bosons and fermions.

Let us conduct following thought experiment consisted of the ball bouncing from the motional barriers:

$$m_b \cdot v_{b1} + m_w \cdot v_{w1} = m_b \cdot v_{b1} + m_w \cdot v_{w1} \quad (31)$$

And:

$$\frac{m_b \cdot v_{b1}^2}{2} + \frac{m_w \cdot v_{w1}^2}{2} = \frac{m_b \cdot v_{b1}^2}{2} + \frac{m_w \cdot v_{w1}^2}{2} \quad (32)$$

If the wall is immensely heavier than a ball then the approximated solution is going to be:

$$v_{b2} = \lim_{m_w \rightarrow \infty} \frac{m_b \cdot v_{b1} + m_w \cdot (2 \cdot v_{w1} - v_{b1})}{m_b + m_w} = 2 \cdot v_{w1} - v_{b1} \quad (33)$$

Above equation states that repulsed ball will increase its speed by repulsion from motional barrier. If we try to establish corresponding set of equations for a photon and a motional mirror then we have:

$$\frac{h \cdot f_1}{c} + \frac{m_m \cdot v_{m1}}{\sqrt{1 - \frac{v_{m1}^2}{c^2}}} = \frac{h \cdot f_2}{c} + m_m \cdot \frac{v_{m2}}{\sqrt{1 - \frac{v_{m2}^2}{c^2}}} \quad (34)$$

And:

$$h \cdot f_1 + \frac{m_m \cdot c^2}{\sqrt{1 - \frac{v_{m1}^2}{c^2}}} = h \cdot f_2 + \frac{m_m \cdot c^2}{\sqrt{1 - \frac{v_{m2}^2}{c^2}}} \quad (35)$$

⇒

$$(36)$$

$$v_{m2} = \pm \sqrt{c^2 - \frac{m_m^2 \cdot c^6 \cdot (c^2 - v_{m1}^2)}{h^2 \cdot (f_1 - f_2)^2 \cdot (c^2 - v_{m1}^2) + m_m^2 \cdot c^6 + 2 \cdot h \cdot (f_1 - f_2) \cdot m_m \cdot c^3 \cdot \sqrt{c^2 - v_{m1}^2}}}$$

(37)

$$v_{m1} = \lim_{m_m \rightarrow \infty} c \cdot \sqrt{1 - \frac{m_m^2 \cdot c^4 \cdot \left(1 - \frac{v_{m1}^2}{c^2}\right)}{h^2 \cdot (f_1 - f_2)^2 \cdot \left(1 - \frac{v_{m1}^2}{c^2}\right) + m_m^2 \cdot c^4 + 2 \cdot h \cdot (f_1 - f_2) \cdot m_m \cdot c^2 \cdot \sqrt{1 - \frac{v_{m1}^2}{c^2}}}}$$

(38)

Above equations simply do not match real situation of a photon repulsing on the mirror with mass m_m , as it is the case with elastic ball bouncing on wall with mass m_w .

Correct solution for the frequency of the photon repulsed by the mirror with infinitive mass is:

$$f_2 = f_1 \cdot \left(1 - \frac{v_{2,1}}{c}\right) = f_0 \cdot \left(1 - \frac{v_{2,1}}{c}\right) \cdot \left(1 - \frac{v_{1,0}}{c}\right) = f_0 \cdot \left(1 - \frac{v_{2,0}}{c}\right)^2$$

(39)

It seems that relativistic equation for energy conservation and pulse conservation equation combined do not reflect our belief in energy conservation, i.e. outcome is not the close to known Doppler's effect formula as it should be, circumstantially implying that something is wrong either with formula for photo effect ($E=h \cdot f$), relativistic formulas or Energy Conservation Law is not a true law. In that case energy conservation is seemingly valid only for low speeds.

Theory of Relativity can be easily fixed as it is circumstantially derived from Maxwell equation and those equations are continuum equations of strings migration and therefore it must be essentially correct.

Situation starts to aggravate with advancement of velocity:

$$\frac{m_a \cdot v_{a1}}{\sqrt{1 - \frac{v_{a1}^2}{c^2}}} + \frac{m_b \cdot v_{b1}}{\sqrt{1 - \frac{v_{b1}^2}{c^2}}} = \frac{m_a \cdot v_{a2}}{\sqrt{1 - \frac{v_{a2}^2}{c^2}}} + \frac{m_b \cdot v_{b2}}{\sqrt{1 - \frac{v_{b2}^2}{c^2}}}$$

(40)

And:

$$\frac{m_a \cdot c^2}{\sqrt{1 - \frac{v_{a1}^2}{c^2}}} + \frac{m_b \cdot c^2}{\sqrt{1 - \frac{v_{b1}^2}{c^2}}} = \frac{m_a \cdot c^2}{\sqrt{1 - \frac{v_{a2}^2}{c^2}}} + \frac{m_b \cdot c^2}{\sqrt{1 - \frac{v_{b2}^2}{c^2}}}$$

(41)

Above two equations paired cannot yield correct solution for infinite mass of the barrier too, as these equations are not linear ones as it is necessary condition to be fulfilled to sustain any Galilean like relativity. We may introduce relativistic formula

for velocities addition, but this will not bring any remedy at all, actually this will exacerbate only.

Simply, infinite mass of the barrier cannot yield any viable solution as the frequency of repulsed photon is identical to the initial one. A possible escape from this odd situation is that energy of a photon depending on its frequency, but not linearly as commonly assumed.

As it has been demonstrated, the Energy and Pulse Conservation laws are duly valid ones for low speeds only, i.e. Newtonian Action-Reaction law is valid for low speeds only.

VIOLATION OF ENERGY CONSERVATION

Pertinent question here is whether we can violate the Energy Conservation Law too, or we can cheat on pulse conservation law only and the pretty compelling answer is that we can violate Energy Conservation Law too as it seems to be a law associated to slow motions only.

There are two well known devices scientifically never talked about: (1) simple electrolytic capacitor tends to self charge itself to certain potential which is known as Petro-Voltaic effect and (2) electric arc welding set (or welding apparatus) is able to release huge excess of energy and also in irradiated light spectrum. Such welding device usually operates merely on several volts and yet it is also able to create electric arc with pretty impressive length emanating mainly ultraviolet radiation far above the ability of this low voltage associated to low electric field too. Usual explanation of this excess of energy is that it comes from the burning of the welded metal itself, but actually, it is not the case as underwater welding has complete absence of oxygen although with huge energy dissipation into surrounding water and yet the arc itself is still hot as expected and quite sustainable. Physical theory behind Petro-Voltaic phenomenon is quantum Casimir effect caused by the fluctuation of the vacuum itself. Relativistic compression of the charged particles' flow in electric arc is able to drain energy from these vacuum fluctuations according Casimir effect, all in respect to the Quantum Mechanics. Recently quite trendy hypersonic rockets are propelled by electric arc relativistic compression with energy excess as their motors are advanced overunity jet engines with efficiency additionally improved by degree of freedom reduction obtained by magnetic field.

UV radiation of welding set also does not match the low voltage existing between electrodes too. All these evidences combined are highly compelling and they deserve to be diligently analyzed.

There is plethora of physical examples violating Energy Conservation Law, but these two compelling examples are quite compelling evidence that something is wrong with Conservation Law on high speeds.

The question of utmost importance right here is whether this drive will bring us the perpetuum-mobile generator also known as Zero Point Energy Sources or not, leaving us still addicted to petrochemical products or we are going to surpass this peculiarity of current moment of history that really lasts for quite a while. Is free energy economically possible to happen although it seems to be quite solid part of physical reality?!

CONSTRUCTION OF EmDRIVE

This is basic modus operandi of EmDRIVE, i.e. basic explanation of its operation. But, the demonstration of its feasibility does not initially mean that its design based on the flat cone is the best one. There is only one shape of the path of the falling body to achieve quickest descent, there is only one optimal shape of the air wing to achieve best lift, only one optimal shape of the propeller blade to achieve maximal thrust, only one shape of the combustion cone with nozzle of the rocket to obtain maximal thrust, and only one optimal shape of the EmDRIVE's cone to obtain maximal force. As aforementioned, these answers require really thorough and profound understanding of the phenomenon and I am really glad to help improvement of this particular drive facilitating creation of its patent application thorough explanation of its operation. All inquiries should be sent to the email addresses listed below:

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