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Unified Absolute Relativity Theory

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Introduction – Everything is relative, including light speed.

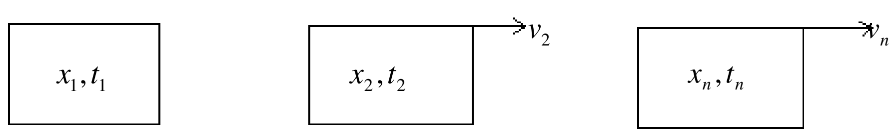
From a particular and evident property of the Lorentz's equations we have derived a theory that agrees with all known experimental data and works for atomic and sub atomic scales, but it also works for gravity at macroscopic scales.

Basis of the theory

From the Lorentz's equations:

$$\begin{cases} x = \dfrac{x_0 + vt_0}{\sqrt{1 - v^2/c^2}} \\ t = \dfrac{t_0 + vx_0/c^2}{\sqrt{1 - v^2/c^2}} \end{cases} \quad \Leftrightarrow \quad c^2t^2 - x^2 = c^2{t_0}^2 - {x_0}^2$$

For n relative frames with v_n relative speeds:



$$\begin{cases} x_2 = \dfrac{x_1 + v_2t_1}{\sqrt{1 - {v_2}^2/c^2}} \\ t_2 = \dfrac{t_1 + v_2x_1/c^2}{\sqrt{1 - {v_2}^2/c^2}} \end{cases} \quad \Leftrightarrow \quad c^2{t_2}^2 - {x_2}^2 = c^2{t_1}^2 - {x_1}^2$$

$$\begin{cases} x_n = \dfrac{x_1 + v_n t_1}{\sqrt{1 - v_n{}^2 / c^2}} \\ t_n = \dfrac{t_1 + v_n x_1 / c^2}{\sqrt{1 - v_n{}^2 / c^2}} \end{cases} \quad \Leftrightarrow \quad c^2 t_n{}^2 - x_n{}^2 = c^2 t_1{}^2 - x_1{}^2$$

$$v_x = c^2 \frac{v_n - v_2}{c^2 - v_n v_2}$$

$$\begin{cases} x_n = \dfrac{x_2 + v_x t_2}{\sqrt{1 - v_x{}^2 / c^2}} \\ t_n = \dfrac{t_2 + v_x x_2 / c^2}{\sqrt{1 - v_x{}^2 / c^2}} \end{cases} \quad \Leftrightarrow \quad c^2 t_n{}^2 - x_n{}^2 = c^2 t_2{}^2 - x_2{}^2$$

So:

$$c^2 t_1{}^2 - x_1{}^2 = c^2 t_2{}^2 - x_2{}^2 = \cdots = c^2 t_n{}^2 - x_n{}^2 \quad \Leftrightarrow$$

$$c^2 t_n{}^2 - x_n{}^2 = k \quad \text{(Constant)}$$

The orthodox relativity use $k = S^2$ as a variable, but as we have demonstrate k is a constant with only one value for all wave particles. As we can't give independent values to x and t **the space-time doesn't exist**. x and t are not space and time but wavelength and period of a electromagnetic wave.

One direct consequence is that vacuum light speed is variable with the frequency.

Derivation and Generalization of the Planck's Formula

The Planck's formula $E = hf$ is not correct for all electromagnetic spectrum.

Magnetic wave equation: $B = B_0 \sin\left[\dfrac{4\pi^2}{x^2}\left(c^2 t^2 - x^2\right)\right]$

Energy of the magnetic field: $E = \frac{B^2 x^3}{2\mu_0}$

$$E = \frac{x^3}{2\mu_0} B_0^{\ 2} \sin^2\left[\frac{4\pi^2}{x^2}\left(c^2 t^2 - x^2\right)\right] \quad \text{and} \quad c^2 t^2 - x^2 = k$$

$$\Leftrightarrow \quad E = \frac{x^3}{2\mu_0} B_0^{\ 2} \frac{16\pi^4 k^2}{x^4} \quad \Leftrightarrow \quad E = \frac{16 B_0^{\ 2} \pi^4 k^2}{2\mu_0 x}$$

And $x = \frac{w}{f}$ $\Leftrightarrow$ $E = \frac{c}{w} hf$

General Planck's formula: $E = \frac{c}{\sqrt{c^2 - kf^2}} hf$

$$B_0 = 2.9353 \times 10^{17} ms^{-1}; \qquad E_0 = 8.8 \times 10^{25} m^2 s^{-2}$$

Exact value of k

Equalling the forces of the electron:

$$F = \frac{khf_e^{\ 4}}{c^3} = \frac{q^2}{4\pi\varepsilon_0 R_e^{\ 2}} \quad \text{and} \quad R_e = \frac{137^2 x_e}{\pi}$$

$$\Leftrightarrow \quad k = \frac{q^2 x_e^{\ 2} \pi}{4\varepsilon_0 hc 137^4} \quad \Leftrightarrow \quad k = 1.91555918 \times 10^{-34} m^2$$

Exact mass of the proton:

Energy: $E = 1.50327736 \times 10^{-10} J$

$$m = \frac{E}{hc^3}\sqrt{kE^2 + h^2 c^2} = 1.67271338 \times 10^{-27} kg$$

The Unified Absolute Relativity Theory predicts the mass of the electron:

$$m_e = \frac{hq}{2\times 137^2}\sqrt{\frac{\pi}{\varepsilon_0 hc^3 k}}$$

Another formula for k:

$$k = \sqrt{\frac{\mu_0 h 137^3 x_e{}^3}{8\pi^4 c^3 (137x_e + \varepsilon_0)^3}}$$

Electron wavelength:

$$x_e(137x_e + \varepsilon_0)^3 = \frac{2\mu_0 h^3 137^{11}\varepsilon_0{}^2}{c\pi^6 q^4}$$

Hydrogen-Deuterium Abundance

$$(1-x)m_H + xm_D = 1.6728\times 10^{-27}$$

x – Abundance of the deuterium; m_D - Deuterium mass; m_H - Hydrogen mass

$$m_D \approx 2m_H$$

$$m_H = \frac{1.6728\times 10^{-27}}{1+x} = 1.6727\times 10^{-27}$$

$$x = 6\times 10^{-5}$$

The wrong abundance of the deuterium is 1.1×10^{-4} to keep the wrong Einstein's mass of 1.6726×10^{-27}.

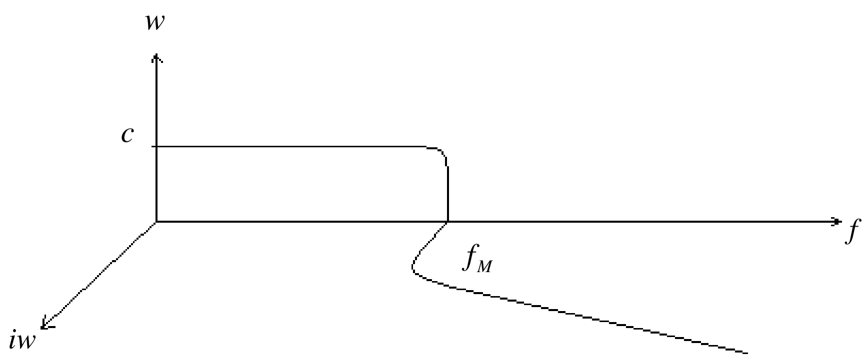
Wrong formula: $E = mc^2$

Right formula: $E = mcw$

The right abundance is not from the variable abundance in a particular sea water, but from the universe abundance.

Speed of the electromagnetic waves

$$w = \sqrt{c^2 - kf^2}$$



For $w = 0$ $\Leftrightarrow$ $f_M = \dfrac{c}{\sqrt{k}}$

Matter frequency -- $f_M = 2.16607214 \times 10^{25}\, Hz$

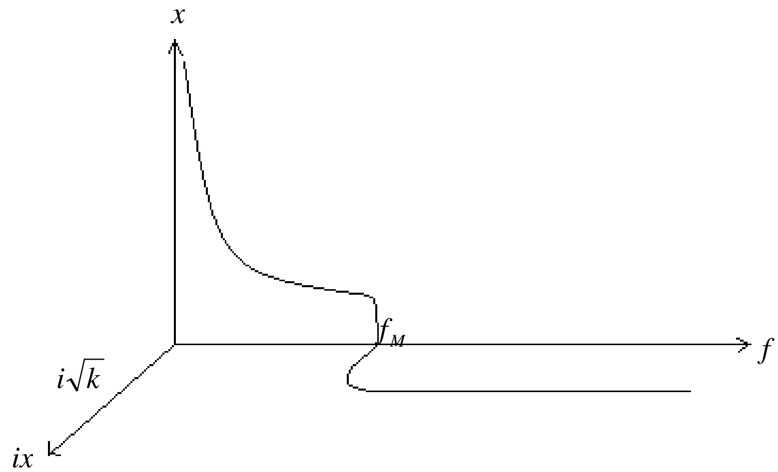
As we can see for low frequency waves, like light, the speed appears as a constant but the speed changes a lot exactly for the frequencies related with subatomic particles, the scale where classic relativity fails.

The small variation of speed for low frequencies is allowed by all known experimental data.

For frequencies greater then f_M the waves have imaginary speeds and wavelengths that mean they are longitudinal waves.

Wavelength of a wave-particle

$$x = \frac{\sqrt{c^2 - kf^2}}{f}$$



$$\sqrt{k} = \lambda_k = 1.38403728 \times 10^{-17}\, m$$

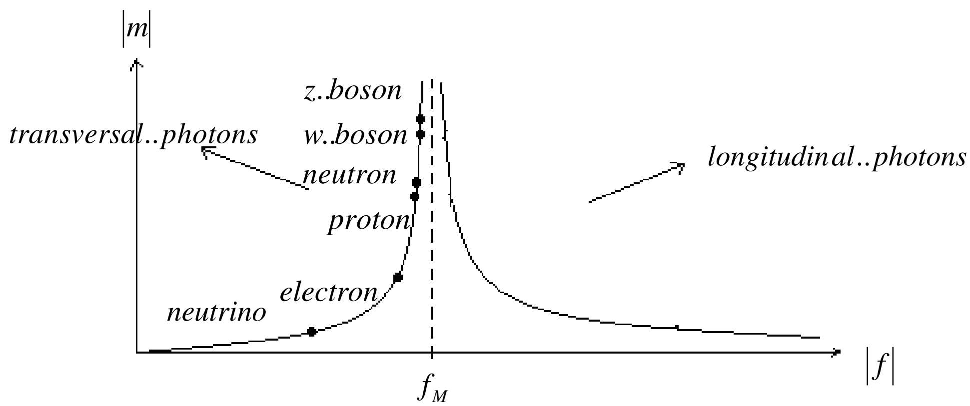
Energy of a wave particle

$$E = \frac{hcf}{\sqrt{c^2 - kf^2}} \qquad \text{and} \qquad E = mcw$$

$$mw^2 = hf \qquad \Leftrightarrow$$

$$\Leftrightarrow \qquad m = \frac{hf}{c^2 - kf^2}$$

Mass of a wave particle



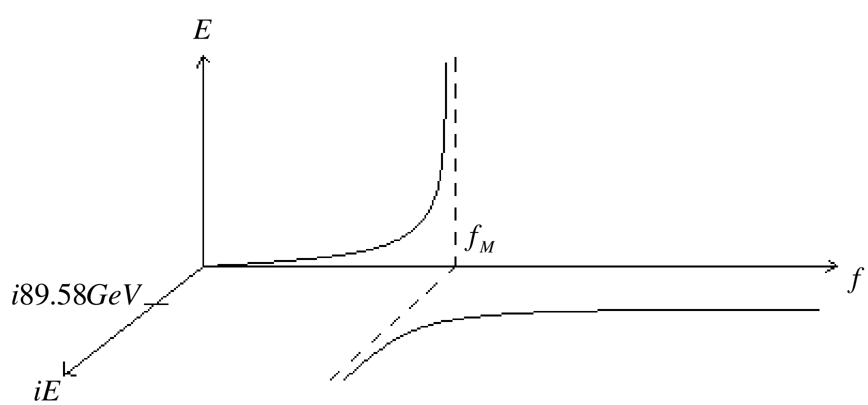
To explain all the existing particles, frequencies and masses must be positive and negative.

The sum of all that exists is equal to zero.

The masses of the longitudinal photons are negative.

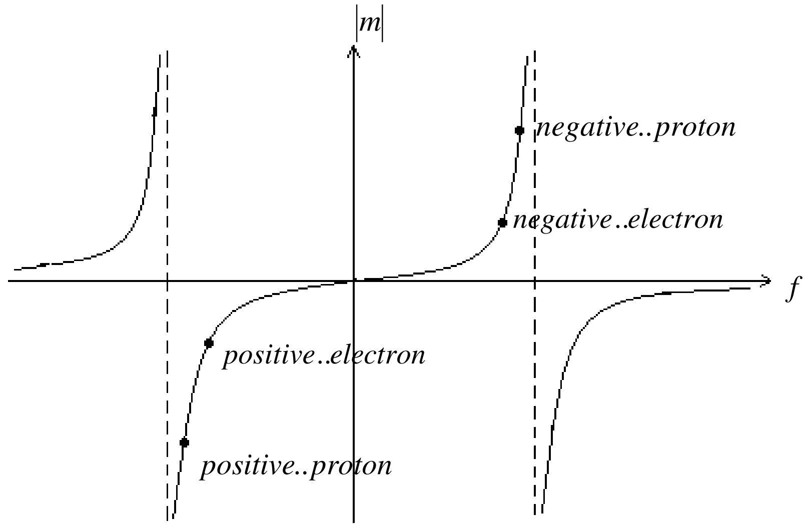
The mass has the signal of the charge.

Energy of a wave particle



The energies of the longitudinal photons are imaginary.

General wave particle symmetry



Unified force

According to our theory the light speed is variable, so around the particles exists a field of speed variation or an acceleration field. The variation of speed with time is equivalent of the variation of the squared speed with space.

The forces must be explained by only one mechanism and only one formula.

For example, the protons have only one force not the electric and the strong.

$$w = \sqrt{c^2 - kf^2} \quad \Leftrightarrow \quad w = \frac{\sqrt{c^2 t^2 - k}}{t}$$

Acceleration:

$$g = \frac{dw}{dt} \quad \Leftrightarrow \quad g = \frac{kf^3}{w}$$

Force:

$$F = mg \quad \text{and} \quad m = \frac{hf}{w^2}$$

Force between two equal particles:

$$\Leftrightarrow \qquad F = \frac{khf^4}{w^3} \qquad \text{or}$$

$$\Leftrightarrow \qquad F = \frac{kh(c^2 - v^2)^2 f_0{}^4}{c^2(c^2 + vw_0)(w_0 + v)^3}$$

Unified force between two electrons

$$F_{ee} = \frac{hkf^4}{w^3} = \frac{khc}{x_e{}^3\sqrt{k + x_e{}^2}} \qquad \text{and} \qquad x_e = 2.426 \times 10^{-12}\, m$$

$$F_{ee} = 1.142 \times 10^{-12}\, N$$

Electric force:

$$F_\varepsilon = \frac{q_e{}^2}{4\pi\varepsilon_0 R^2} = \frac{hkf^4}{w^3} \qquad \Leftrightarrow$$

$$\Leftrightarrow \qquad R = 1.42 \times 10^{-8}\, m$$

Rydberg constant:

$$R_H = 1.0968 \times 10^7\, m^{-1}$$

Rydberg wavelenght:

$$\lambda_H = \frac{1}{R_H} = 9.1174 \times 10^{-8}\, m$$

$$\lambda_H = 2.\pi.R$$

This is a proof that the electric force is equal to the unified force for the electron.

Force in hydrogen atom

Rydberg constant: $R_H = 1.096776\times10^{7}\, m^{-1}$

Rydberg wavelength: $\lambda_H = \dfrac{1}{R_H} = 9.11763\times10^{-8}\, m$

Rydberg frequency: $f_H = \dfrac{c}{\lambda_H} = 3.28805\times10^{15}\, Hz$

Orbital frequency: $f_{OR} = 2 f_H$

Orbital speed: $v = 137 x_e f_{OR}$ and $x_e = 2.426\times10^{-12}\, m$

Bohr radius: $R_B = \dfrac{v}{2\pi . f_{OR}} = 5.3\times10^{-11}\, m$

Centript acceleration: $g = \dfrac{v^2}{R} = 9.035\times10^{22}$

$x_e = 2.426\times10^{-12}$ $m_e = 9.11\times10^{-31}$ $g_e = 1.1478\times10^{18}$

$x_p = 1.32\times10^{-15}$ $m_p = 1.6728\times10^{-27}$ $g_p = 7.112\times10^{27}$

$$g = \sqrt{g_e g_p} = 9.035\times10^{22}$$

$$F = m_e g = 8.231\times10^{-8}\, N$$

This is another proof of the validity of the unified force.

Unified force = Strong force

Two protons: $F_{PP} = m_P g_P = +12.973N$

Two neutrons: $F_{NN} = m_N g_N = +13.041N$

A proton and a neutron: $F_{PN} = m_P g_N = -13.00N$

What about the electric force?

$$13 = \frac{q_e^{\;2}}{4\pi\varepsilon_0 R^2} \quad \Leftrightarrow \quad R = 4.2\times10^{-15}m$$

This is precisely the distance between the proton and the neutron in a deuteron. The strong force is equal to the electric force, that means that the strong force doesn't exist.
The neutrons behaves as a negatively charged particles, it is only neutral for macroscopic distances.

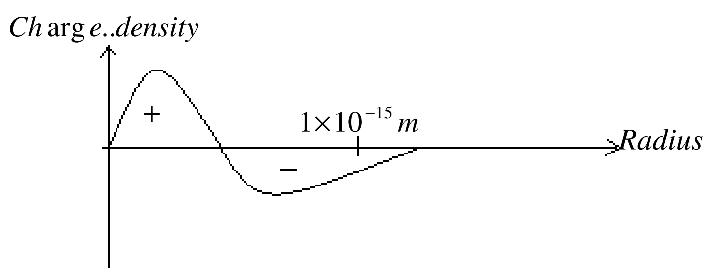
$2\pi R = nx_P$ and $x_P = 1.32\times10^{-15}$ (Compton wavelength of the proton)

$\Leftrightarrow$ n = 20

Acceleration: $g = \dfrac{v^2}{R} = 7.755\times10^{27} \quad \Leftrightarrow \quad v = 5.7158\times10^6$

The binding energy is not kinetic or potential.

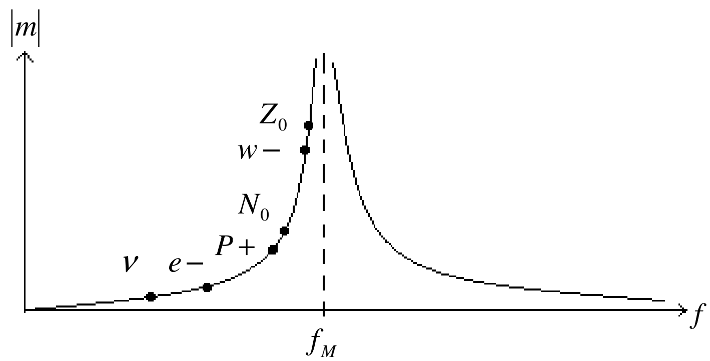
Electric field of the neutron



The Particle Values

$$mcw = \frac{chf}{w} \qquad \Leftrightarrow \qquad m = \frac{hf}{c^2 - kf^2}$$

$$f = \frac{-h + \sqrt{h^2 + 4km^2c^2}}{2mk}$$



Neutron:

$m = 1.6749\times10^{-27}\,kg$; $\qquad f = 2.27156\times10^{23}\,Hz$

$w = \sqrt{c^2 - kf^2} = 2.9977532\times10^{8}\,ms^{-1}$

$x = \frac{w}{f} = 1.31969\times10^{-15}\,m$; $\qquad g = \frac{kf^3}{w} = 7.78635\times10^{27}\,ms^{-2}$

Proton:

$m = 1.6727\times10^{-27}$; $\qquad f = 2.26858\times10^{23}$

$w = 2.99775365\times10^{8}$; $\qquad x = 1.321423\times10^{-15}$

$g = 7.75574\times10^{27}$

Neutrino:

$$m = 4\times10^{-36}$$

$$f = \frac{mc^2}{h} = 5.425571\times10^{14} \;; \qquad w = c$$

$$\Delta w = \frac{kf^2}{2c} = 9.7768\times10^{-14} \;; \qquad x = 5.5255467\times10^{-7}$$

$$g = 1.061\times10^{2}$$

Boson Z

$$E = i91.2GeV \qquad E = \frac{hc\sqrt{c^2 - w^2}}{w\sqrt{k}}$$

$$w = i2.08\times10^{8}\,ms^{-1} \qquad f = 1.53\times10^{25}\,Hz$$

$$x = i1.36\times10^{-17}\,m \qquad m = -2.34\times10^{-25}\,kg$$

Boson W

$$E = 80.4GeV \qquad w = 2.21\times10^{8}\,ms^{-1}$$

$$f = 1.43\times10^{25}\,Hz \qquad x = 1.542\times10^{-17}\,m$$

$$m = 1.95\times10^{-25}\,kg$$

Top quark

$$E = 174.2GeV \qquad w = 1.35\times10^{8}$$

$$f = 1.9\times10^{25} \qquad x = 7.11766\times10^{-18}$$

$$m = 6.9\times10^{-25}$$

Electron

$E = 0.510998918 MeV$ $\quad$ $f = 1.23559\times10^{20}$

$x = 2.42631017\times10^{-12}$ $\quad$ $w \approx c$

$c - w = \Delta w$ $\quad$ $2c\Delta w = kf^2$ $\quad$ $\Delta w = 5.07\times10^{-3} ms^{-1}$

$m = 9.10938229\times10^{-31}$ $\quad$ $g = \frac{kf^3}{w} = 1.253\times10^{18} ms^{-2}$

$F = mg = 1.14\times10^{-12} N$

Monopole

$$F = \frac{q_m{}^2}{4\pi\mu_0 x^2} = \frac{khf^4}{w^3} \qquad q_m = \frac{h}{2q_e}$$

q_e -- Electric charge; μ_0 -- Vacuum permeability

$x = 1.2427\times10^{-17}$ $\quad$ $f = 1.2752\times10^{25}$

$w = 1.584552\times10^{8}$ $\quad$ $m = 3.365\times10^{-25}$

$E = 99.8 GeV$

Mass and Energy Relation

$$E = mcw = \frac{hcf}{w}$$

For high energy particles

$$\frac{\Delta E}{\Delta m} = hc^3 \frac{\sqrt{h^2c^2 + kE^2}}{h^2c^2 + 2kE^2}$$

For charged particles with low energy:

$$\Delta E = c^2 \Delta m$$

For high energy particles:

$$\frac{\Delta E}{\Delta m} = \frac{hc^3}{2\sqrt{k}E}$$

Absolute Relativity Kinematics

$$\begin{cases} x = x_0\sqrt{1-v^2/c^2} \\ t = t_0/\sqrt{1-v^2/c^2} \end{cases} \Leftrightarrow \quad xt = x_0 t_0 = A \quad \text{(Constant)}$$

$$w = x/t \quad \text{and} \quad f = 1/t \quad \Leftrightarrow \quad w = Af^2$$

$$\text{And} \quad mw^2 = hf$$

$$\Leftrightarrow \quad f^3 = h/mA^2 \quad \text{and} \quad f_0^{\,3} = h/m_0 A^2$$

$$\text{As} \quad f = f_0\sqrt{1-v^2/c^2} \quad \Leftrightarrow \quad \underline{m = m_0/(1-v^2/c^2)^{3/2}}$$

$$w = x/t \quad \Leftrightarrow \quad w = \frac{x_0(1-v^2/c^2)}{t_0} \quad \Leftrightarrow \quad \underline{w = w_0(1-v^2/c^2)}$$

$$\Leftrightarrow \quad E = \frac{hcf}{w} = hc\frac{f_0\sqrt{1-v^2/c^2}}{w_0(1-v^2/c^2)} \quad \Leftrightarrow$$

$$\Leftrightarrow \qquad E = E_0 / \sqrt{1 - v^2 / c^2}$$

Kinetic energy

$$E_k = E - E_0 \qquad \text{and} \qquad E = E_0 / \sqrt{1 - v^2 / c^2}$$

$$E_0 = m_0 c w_0 \qquad \Leftrightarrow \qquad E_k = \frac{m_0 c w_0}{c^2} \frac{v^2}{\sqrt{1 - v^2 / c^2}\left(1 + \sqrt{1 - v^2 / c^2}\right)}$$

For $w_0 = c$ and $v << c$ $\Leftrightarrow$ $E_k = \frac{1}{2} m_0 v^2$

Momentum

$$p = mv \qquad \Leftrightarrow \qquad p = \frac{m_0 v}{(1 - v^2 / c^2)^{3/2}} \qquad \text{and} \qquad v = v_0 (1 - {v_0}^2 / c^2)$$

$$p = \frac{m_0 v_0}{\sqrt{1 - {v_0}^2 / c^2}}$$

Binding energy of two quarks

$$x \approx 8 \times 10^{-19} m$$

$$E = Fx = \frac{{q_m}^2}{\mu_0 x} = 26.4 TeV$$

For the moment there's no particle accelerator with enough energy to separate two quarks or monopoles.

New particle

We found a new particle that is the quantum of vacuum and its energy is equal to the potential energy of the particle in the universe gravitational field. Several experiments show a missing mass precisely equal to 310 MeV.

$$E_0 = \left(\frac{\varepsilon_0}{\mu_0}\right)^2 = 310 MeV$$

$\varepsilon_0 =$ Vacuum permittivity; $\mu_0 =$ Vacuum permeability

Gravitational potential energy:

$$E_0 = \frac{GM_U m_0}{R_U}$$

G – Gravitational constant; $M_U =$ mass of our universe

$R_U =$ Radius of our universe (we leave at the surface of our universe)

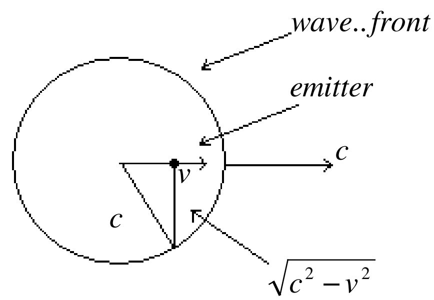
$$E_0 = hf_0 \; ; \qquad f_0 = 7.5 \times 10^{22} Hz$$

$$m_0 = \frac{hf_0}{c^2} = 5.5 \times 10^{-28} kg$$

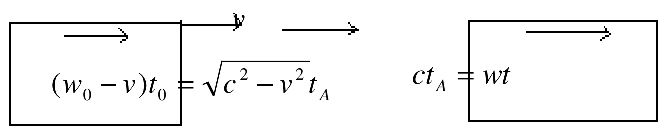
Those properties prove the relation between electromagnetism and gravity.

Derivation of the Lorentz's equations and their true meaning

Transverse effect propagation speed:



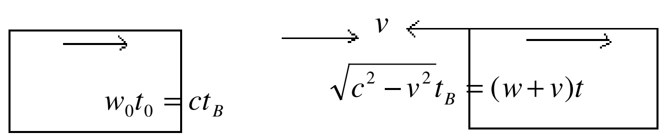
Approximation:



$$\begin{cases} (w_0 - v)t_0 = \sqrt{c^2 - v^2}\,t_A \\ ct_A = wt \end{cases} \quad \Leftrightarrow \quad (w_0 - v)t_0 = \sqrt{c^2 - v^2}\,\frac{wt}{c}$$

With $w_0 t_0 = x_0$ and $wt = x$ $\Leftrightarrow$

$$\Leftrightarrow \quad x = \frac{x_0 - vt_0}{\sqrt{1 - v^2 / c^2}}$$



$$\begin{cases} w_0 t_0 = ct_B \\ \sqrt{c^2 - v^2}\,t_B = (w + v)t \end{cases} \quad \Leftrightarrow \quad \sqrt{c^2 - v^2}\,\frac{w_0 t_0}{c} = (w + v)t \quad \Leftrightarrow$$

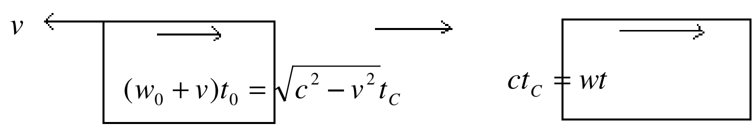
$$\Leftrightarrow \quad \sqrt{1 - v^2 / c^2}\,x_0 = x + vt$$

Substituting the value of *x*:

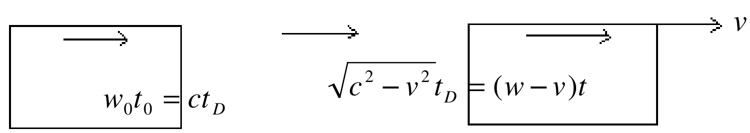
$$\Leftrightarrow \quad \sqrt{1 - v^2 / c^2}\,x_0 = \frac{x_0 - vt_0}{\sqrt{1 - v^2 / c^2}} + vt \quad \Leftrightarrow$$

$$\Leftrightarrow \qquad t = \frac{t_0 - vx_0 / c^2}{\sqrt{1 - v^2 / c^2}}$$

Separation:



$$\Leftrightarrow \qquad x = \frac{x_0 + vt_0}{\sqrt{1 - v^2 / c^2}}$$



$$\Leftrightarrow \qquad t = \frac{t_0 + vx_0 / c^2}{\sqrt{1 - v^2 / c^2}}$$

All the solutions of the systems without *v*:

$$x = \frac{x_0 + vt_0}{\sqrt{1 - v^2/c^2}} \longrightarrow x_0 = \frac{x - vt}{\sqrt{1 - v^2/c^2}} \longrightarrow x_0 t_0 = -xt$$

$$x_0 = \frac{x - vt}{\sqrt{1 - v^2/c^2}} \nearrow \quad x = x_0..or..x = ct_0, \quad x_0 = ct..or..t = t_0$$

$$t = \frac{t_0 + vx_0/c^2}{\sqrt{1 - v^2/c^2}} \longrightarrow t_0 = \frac{t - vx/c^2}{\sqrt{1 - v^2/c^2}} \longrightarrow x_0 t_0 = xt$$

$$t_0 = \frac{t - vx/c^2}{\sqrt{1 - v^2/c^2}} \searrow \quad x = x_0..or..x = ct_0, \quad x_0 = ct..or..t = t_0$$

$$c^2t^2 - x^2 = c^2{t_0}^2 - {x_0}^2 \qquad c^2t^2 - x^2 = c^2{t_0}^2 - {x_0}^2$$

One possible general form of the Lorentz's equations:

$$v \longrightarrow v\cos\alpha$$

$$\begin{cases} x_0 = \dfrac{x - vt\cos\alpha}{\sqrt{1 - v^2/c^2}} \\ t = \dfrac{t_0 + vx_0\cos\alpha/c^2}{\sqrt{1 - v^2/c^2}} \end{cases} \Leftrightarrow$$

$$\Leftrightarrow \begin{cases} x = \dfrac{x_0(1 - v^2 sen^2\alpha/c^2) + vt_0\cos\alpha}{\sqrt{1 - v2/c2}} \\ t = \dfrac{t_0 + vx_0\cos\alpha/c^2}{\sqrt{1 - v^2/c^2}} \end{cases}$$

For the four equations:

$$\alpha = 0 \quad \Leftrightarrow \quad \begin{cases} x = \dfrac{x_0 + vt_0}{\sqrt{1 - v^2/c^2}} \\ t = \dfrac{t_0 + vx_0/c^2}{\sqrt{1 - v^2/c^2}} \end{cases} \quad \Leftrightarrow \quad c^2t^2 - x^2 = c^2{t_0}^2 - {x_0}^2$$

$$\alpha = 90 \quad \Leftrightarrow \quad \begin{cases} x = x_0\sqrt{1 - v^2/c^2} \\ t = \dfrac{t_0}{\sqrt{1 - v^2/c^2}} \end{cases} \quad \Leftrightarrow \quad xt = x_0 t_0$$

New general relativity calculations

Light deflection by the sun

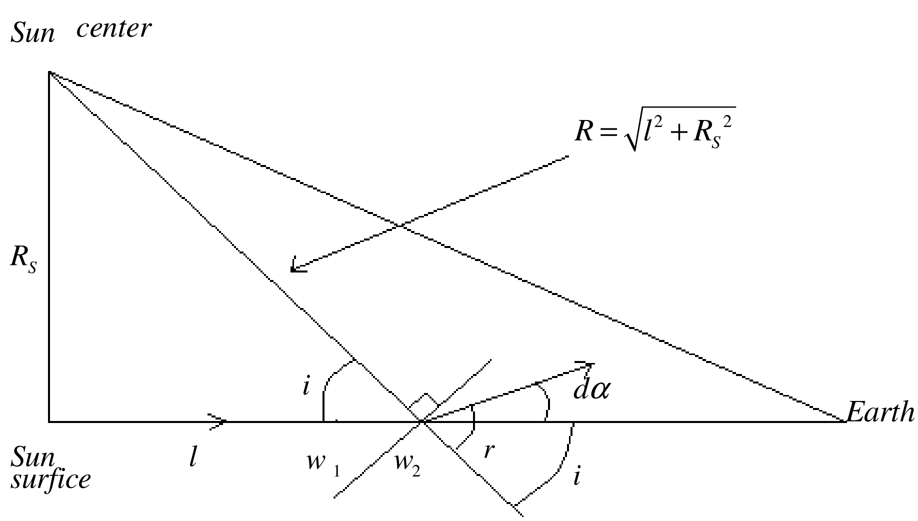
As the space contraction and time dilatation formulas are note equal we conclude that light speed is variable, so we demonstrate that the values of one test of general relativity can be calculated if we consider that the light speed in gravitational fields behaves as in the optical mediums.

This test conceived by Einstein try to calculate the deviation of a light ray from a distant star that passes near the Sun surface and is observed on the Earth.

$$\begin{cases} x = x_0\sqrt{1-v^2/c^2} \\ t = \dfrac{t_0}{\sqrt{1-v^2/c^2}} \end{cases} \quad \text{and} \quad w = x/t \quad \text{and} \quad w_0 = x_0/t_0 \quad \Leftrightarrow$$

$$\Leftrightarrow \quad w = w_0\frac{c^2-v^2}{c^2} \quad \text{and} \quad w_0 \approx c \quad \Leftrightarrow$$

$$\Leftrightarrow \quad w = \frac{c^2-v^2}{c} \quad \Leftrightarrow \quad \Delta w = -\frac{2v}{c}\Delta v \quad (1)$$



On the place defined by the distance l , from the Sun surface, the light ray that passes near the Sun has an incident angle i , a refraction angle r and an angle shift $d\alpha$
The refraction plan divide two zones of the space with propagation speeds w_1 and w_2 .
According to the laws of refraction:

$$seni = \frac{w_1}{w_2} senr \quad ; \quad seni = \frac{R_S}{\sqrt{l^2 + R_S{}^2}} \quad ; \quad senr = \frac{R_S}{\sqrt{l^2 + R_S{}^2}} \frac{w_2}{w_1}$$

$$\cos i = \frac{l}{\sqrt{l^2 + R_S{}^2}} \quad ; \quad r = i + d\alpha \quad ; \quad sen(i + d\alpha) = \frac{R_S}{\sqrt{l^2 + R_S{}^2}} \frac{w_2}{w_1}$$

$$seni.\cos d\alpha + \cos i.send\alpha = \frac{R_S}{\sqrt{l^2 + R_S{}^2}} \frac{w_2}{w_1} \quad \Leftrightarrow \quad R_S + l.d\alpha = R_S \frac{w_2}{w_1} \quad \Leftrightarrow$$

$$\Leftrightarrow \quad d\alpha = \frac{R_S}{l} \frac{w_2 - w_1}{w_1} \quad \Leftrightarrow \quad d\alpha = \frac{R_S}{l.c} \Delta w$$

$$\text{and} \quad \Delta w = -\frac{2v}{c} \Delta v \quad \Leftrightarrow \quad d\alpha = \frac{-2R_S v}{l.c^2} dv \quad (2)$$

If we want to put gravity in the relativity equations we must change the linear velocity v by the escape speed as the gravitational potential:

$$v^2 = \frac{2GM_S}{R} \quad ; \quad M_S \text{ -- Sun mass}$$

$$v = \frac{\sqrt{2GM_S}}{\sqrt[4]{l^2 + R_S{}^2}} \quad \Leftrightarrow \quad dv = -\frac{\sqrt{2GM_S}}{2} \frac{l}{\left(l^2 + R_S{}^2\right)^{5/4}} dl$$

Substituting v and dv in (2) we get:

$$d\alpha = \frac{2GM_S R_S}{c^2} \frac{dl}{\left(l^2 + R_S{}^2\right)^{6/4}} \quad \Leftrightarrow$$

$$\Leftrightarrow \quad \alpha = \frac{2GM_S R_S}{c^2} \int_0^{D_{ES}} \frac{dl}{\left(l^2 + R_S{}^2\right)^{6/4}} \quad ; \quad D_{ES} = \text{Earth Sun distance}$$

We have only consider the angle deviation of the light ray that comes from the Sun. Considering also the light ray that goes to the Sun, the deviation angle will be double:

$$\Leftrightarrow \quad \delta = 2\alpha$$

$$\Leftrightarrow \qquad \delta = \frac{4GM_S R_S}{c^2} \frac{1}{{R_S}^2} \qquad \Leftrightarrow \qquad \delta = \frac{4GM_S}{c^2 R_S}$$

$$\delta = 8.4838561 \times 10^{-6}\, rad = 1.75''$$

Thus, we have calculated the correct deviation.

Shapiro time delay

This test of general relativity conceived by Irwin Shapiro intends to measure the delay of a radar signal from the Earth to Mars, when the superior conjunction, reflected on Mars and detected on the Earth.

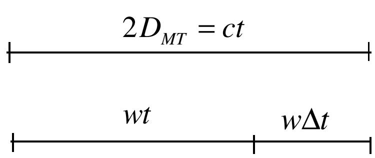
The signal passes near the Sun's surface and due to the space-time bending it suffers a delay.

Our calculations consider the space absolute and the light speed variable.

$D_{MS} = 2.279 \times 10^{11}$ **--** Mars Sun distance; $D_{TS} = 1.5 \times 10^{11}$ --Earth Sun distance;

$D_{MT} = 3.779 \times 10^{11}$ --Mars Earth distance; $M_S = 1.989 \times 10^{30}$ -- Sun's mass

$R_S = 6.95 \times 10^{8}$ -- Sun's radius.



$$\Delta t = 2D_{MT} \frac{c - w}{cw}$$

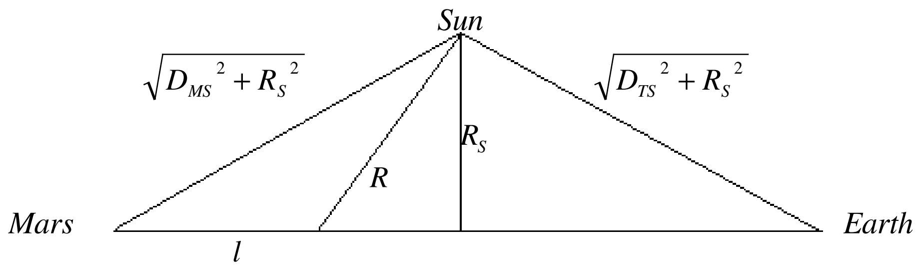
$\Delta t =$ time delay ; $w =$ slower light speed

$$w \approx c \qquad \Leftrightarrow \qquad \Delta t = 2D_{MT} \frac{c - w}{c^2}$$

$$\begin{cases} x = x_0 \sqrt{1 - v^2 / c^2} \\ t = \dfrac{t_0}{\sqrt{1 - v^2 / c^2}} \end{cases} \quad \text{and} \quad w = x / t\,; \quad w_0 = x_0 / t_0\,; \quad w_0 \approx c \qquad \Leftrightarrow$$

$$w = \frac{c^2 - v^2}{c} \qquad \Leftrightarrow \qquad c - w = \frac{v^2}{c} \qquad \Leftrightarrow \qquad \Delta t = 2D_{MT} \frac{v^2}{c^3}$$

Escape speed: $\quad {v_i}^2 = \dfrac{2GM_S}{R} \quad$ and



$$R = \sqrt{(l - D_{MS})^2 + R_S{}^2} \quad \Leftrightarrow$$

$$\Leftrightarrow \quad v_i{}^2 = \frac{2GM_S}{\sqrt{(l - D_{MS})^2 + R_S{}^2}}$$

Average v:

$$v^2 = \frac{\int_0^{D_{MT}} \frac{2GM_S dl}{\sqrt{(l - D_{MS})^2 + R_S{}^2}}}{D_{MT}} \quad \Leftrightarrow$$

$$\Leftrightarrow \quad v^2 = \frac{2GM_S}{D_{MT}} \log\left(\frac{4D_{MS}D_{TS}}{R_S{}^2}\right) \quad \text{and} \quad \Delta t = 2D_{MT}\frac{v^2}{c^3} \quad \Leftrightarrow$$

$$\Leftrightarrow \quad \Delta t = \frac{2GM_S}{c^3} \log\left(\frac{4D_{MS}D_{TS}}{R_S{}^2}\right)$$

$$\underline{\Delta t = 247.2\mu s}$$

The experimental value of Δt is a little lower than $250\mu s$.

Correction of Mercury's perihelion precession

We do the derivation and the calculation of the general relativity correction of the Mercury's perihelion precession, considering that the space is absolute and the light speed is variable in gravitational fields.

Correction of the gravitational force

From the formulas of the space contraction and time dilatation:

$$\begin{cases} x = x_0\sqrt{1-v^2/c^2} \\ t = \dfrac{t_0}{\sqrt{1-v^2/c^2}} \end{cases} \quad \Leftrightarrow \quad xt = x_0 t_0 = A \qquad (A = \text{constant})$$

Doing $w = x/t$ e $f = 1/t$ $\Leftrightarrow$ $w = Af^2$

The wave energy is given:

$$E = mcw \quad \text{and} \quad E = \frac{hcf}{w} \quad \Leftrightarrow$$

$$\Leftrightarrow \quad f^3 = \frac{h}{mA^2} \quad \text{and} \quad f_0{}^3 = \frac{h}{m_0 A^2}$$

As $f = f_0\sqrt{1-v^2/c^2}$ $\Leftrightarrow$ $m = \dfrac{m_0}{(1-v^2/c^2)^{3/2}}$

This equation is different from the Einstein's formula. But this one is coherent with the two equations of time dilatation and space contraction.

No one can explain why the Einstein's formula only can be derived from the time equation, denying the space formula.

We think there is an interpretation problem of the experimental data. All the experiments give not the relation between the masses but the relation between the ratio of the mass by the electric charge.

$$\frac{m}{q} = \frac{m_0}{q_0}\frac{1}{\sqrt{1-v^2/c^2}}$$

If we consider that the charge is also variable:

$$q = \frac{q_0}{1-v^2/c^2}$$

Thus, $\Delta m = m - m_0 = \dfrac{m_0}{(1-v^2/c^2)^{3/2}} - m_0$ $\Leftrightarrow$ $\Delta m \approx m_0\dfrac{3v^2}{2c^2}$

with $v^2 = \frac{2GM}{r}$ (free fall speed from infinity)

$$\Delta m = m\frac{3GM}{c^2 r}$$

$$F = \frac{GMm}{r^2} \quad \Leftrightarrow \quad \Delta F = \frac{GM}{r^2}\Delta m \quad \Leftrightarrow \quad \Delta F = \frac{3G^2M^2m}{c^2r^3}$$

$$F = -\frac{GMm}{r^2} - \frac{3G^2M^2m}{c^2r^3}$$

Orbital movement equation

Doing $u = \frac{1}{r}$ we have the classical equation of an elliptic orbit

$$\frac{d^2u}{d\theta^2} + u = -\frac{F}{GMma(1-\varepsilon^2)u^2}$$

Substituting the value of F

$$\frac{d^2u}{d\theta^2} + \left(1 - \frac{3GM}{c^2a(1-\varepsilon^2)}\right)u = \frac{1}{a(1-\varepsilon^2)} \qquad (1)$$

As $1 - \frac{3GM}{c^2a(1-\varepsilon^2)} \approx 1$ we can use the classical solution

$$\frac{d^2u}{d\theta^2} + u = \frac{1}{a(1-\varepsilon^2)} \quad \Leftrightarrow \quad u = \frac{1+\varepsilon\cos\theta}{a(1-\varepsilon^2)}$$

Substituting the value of u in (1)

$$a(1-\varepsilon^2)\frac{du}{d\theta} = \frac{3GM}{c^2a(1-\varepsilon^2)}\theta - \theta + \frac{3GM}{c^2a(1-\varepsilon^2)}\varepsilon sen\theta - \varepsilon sen\theta + 1 + C_1 \qquad (2)$$

a = orbit major semi axis ; ε = orbit eccentricity

As we can see the terms of this equation are angles and the term responsible for the correction is:

$$\delta = \frac{3GM}{c^2 a(1-\varepsilon^2)}\theta$$

To obtain the value of δ for a complete orbit we do $\theta = 2\pi$, thus

$$\delta = \frac{6\pi .GM}{c^2 a(1-\varepsilon^2)}$$

$G = 6.67\times10^{-11}$; $M = 1.989\times10^{30}$; $c = 3\times10^{8}$; $a = 5.787\times10^{10}$; $\varepsilon = 0.2056$

$\delta = 5.01317\times10^{-7}$ Radians/revolution

The value of the shift in seconds per one hundred years is:

$$\Delta = \delta\times\frac{180}{\pi}\times3600\times\frac{1}{0.2408}\times100$$

0.2408 = revolution period in years

$$\Delta = 42.94''$$

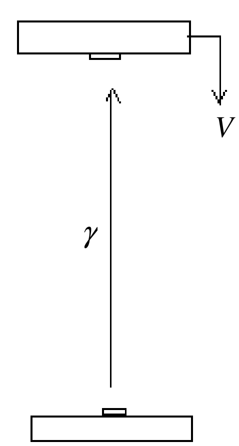
Thus, we have the value of the Mercury's precession.

Saying, after all, that the light speed is constant in the vacuum is false because the vacuum without a gravitational field doesn't exist. All the space is a huge gravitational field.

Pound-Rebka experiment

The real general relativity calculations are very simple.

In this experiment a gamma ray is emitted from the ground to the top of a tower and the gravitational redshift of the ray is cancelled in the detector with a Doppler shift due to the speed V. So, the speed V is a measure of the gravitational redshift when the frequency is the same.



$x_0 = 8.61\times10^{-11}m$; $\Delta R = h = 22.6m$

$V = \Delta V = 7.36\times10^{-7}ms^{-1}$

Gravitational redshift:

$$x = x_0\sqrt{1 - v^2 / c^2} \quad \Leftrightarrow \quad \Delta x = x_0 \frac{v}{c^2}\Delta v$$

And $$v = \sqrt{\frac{2GM}{R}} \quad \Leftrightarrow \quad \Delta v = \sqrt{2GM}\left(-\frac{1}{2}\right)R^{-3/2}\Delta R$$

$$\Leftrightarrow \quad \Delta x = -\frac{x_0}{c^2}\frac{GM}{R^2}\Delta R \quad \Leftrightarrow \quad \Delta x = -x_0 \frac{gh}{c^2}$$

(G – gravitational constant; M – earth mass; R – earth radius; $g = 9.8ms^{-2}$)

$$\underline{\Delta x = -2.12 \times 10^{-25}}$$

Doppler effect:

$$x = x_0 \frac{c + V}{c} \quad \Leftrightarrow \quad \Delta x = \frac{x_0}{c}\Delta V \quad \Leftrightarrow$$

$$\underline{\Delta x = +2.11 \times 10^{-25}}$$

Relativistic Flyby Anomaly

We found that the flyby anomaly of the earth orbits of satellites can be explained by a relativistic correction from The Unified Absolute Relativity Theory.

This anomaly consists of an increase of the speed of the satellites during earth flybys, that can't be explained with Newton's physics.

As the Einstein's general relativity theory doesn't predict this correction, it is a proof that supports our theory.

Orbital movement equation from UART

$$a(1-\varepsilon^2)\frac{du}{d\theta}=\frac{3GM\theta}{c^2a(1-\varepsilon^2)}-\theta+\frac{3GM\varepsilon\sin\theta}{c^2a(1-\varepsilon^2)}-\varepsilon\sin\theta+1+C_1$$

As $\frac{du}{d\theta}=\frac{-\varepsilon\sin\theta}{a(1-\varepsilon^2)}$ and doing: $C_1=-1$ $\Leftrightarrow$

$$\Delta\theta=\frac{3GM\theta}{c^2a(1-\varepsilon^2)}+\frac{3GM\varepsilon\sin\theta}{c^2a(1-\varepsilon^2)}$$

a = major semi axis; ε = eccentricity; M = mass;

G = gravitational constant; c = light speed; θ = angle

The first correction is the geodetic effect or the perihelion precession correction. The two effects are the same.

The gravitomagnetism doesn't exist.

The second correction is the flyby anomaly. As we see the effect cancels for a complete orbit.

Mercury's Perihelion Precession

$$\Delta\theta=\frac{3GM\theta}{c^2a(1-\varepsilon^2)}$$; For one orbit $\theta=2\pi$

$$\Delta\theta=\frac{6\pi.GM}{c^2a(1-\varepsilon^2)}$$

$M=2\times10^{30}kg$; $a=5.8\times10^{10}m$; $\varepsilon=0.2056$

$\Delta\theta=5\times10^{-7}$ radians/revolution

The value of the shift in seconds per one hundred years is:

$$\alpha = \Delta\theta \frac{180}{\pi} 3600 \frac{1}{0.2408} 100 \; ; \qquad 0.2408 = \text{ Revolution period in years}$$

$$\alpha = 42.94 \text{ arc seconds (The same value as Einstein)}$$

Geodetic Effect

$$\Delta\theta = \frac{6\pi.GM}{c^2 a(1-\varepsilon^2)}$$

$$\varepsilon = 0.0014 \; ; \quad a = 7\times 10^6 \; ; \quad M = 6\times 10^{24} \; ; \quad T = 1.84\times 10^{-4} \text{ years}$$

$$\alpha = \Delta\theta \frac{180\times 3600}{\pi.T}$$

$$\alpha = 13.4 \text{ arc seconds/year}$$

The Einstein value is $\alpha = 6.6$, $\frac{13.4}{6.6} = 2$

Flyby Anomaly

$$\Delta\theta = \frac{3GM\varepsilon \sin\theta}{c^2 a(1-\varepsilon^2)}$$

For $\theta = 2\pi \quad \Leftrightarrow \quad \Delta\theta = 0$

The effect cancels for a complete orbit.

Earth Flyby Data

Mission	Date	a (m)	ε	Δv (m/s)
Galileo	Dec90	5×10^{6}	2.47	3.92×10^{-3}
Near	Jan98	8.57×10^{6}	1.81	13.46×10^{-3}
Cassini	Aug99	1.58×10^{6}	5.8	1.1×10^{-4}
Rosetta	Mar05	2.55×10^{7}	1.33	1.82×10^{-3}

Angle for the maximum Δv

Orbital speed: $v = \sqrt{GM\left(\frac{2}{R}+\frac{1}{a}\right)}$ and $v = v\sin\theta$

$$R = \frac{a(1-\varepsilon^2)}{1+\varepsilon\cos\theta} \quad \Leftrightarrow$$

$$v = \sqrt{\frac{GM}{a(1-\varepsilon^2)}}\sqrt{3-\varepsilon^2+2\varepsilon\cos\theta}\,\sin\theta$$

$$\frac{dv}{d\theta}=0 \quad \Leftrightarrow \quad \cos\theta = \frac{\varepsilon^2-3\pm\sqrt{(3-\varepsilon^2)^2+12\varepsilon^2}}{6\varepsilon}$$

Galileo

$$\theta = 0.603537 rad$$

$$\Delta R = a(1-\varepsilon^2)\frac{\varepsilon\sin\theta}{(1+\varepsilon\cos\theta)^2}\Delta\theta \quad \text{and} \quad \Delta\theta = \frac{5GM\varepsilon\sin\theta}{c^2 a(1-\varepsilon^2)}$$

$$\Delta R = 2.85\times10^{-3} \quad ; \quad \Delta v = 3.92\times10^{-3}$$

The variation of R and Δv is along the same direction, and there's a direct relation between them:

$$\Delta v = \frac{\Delta R}{t}$$

We don't know how to derive the value of the time or period t.

For Galileo: $t = 0.7277$

Near

$$\theta = 0.923 \; ; \qquad \Delta R = 6.36 \times 10^{-3}$$

$$t = 0.472$$

Cassini

$$\theta = 1.7441 \quad \Leftrightarrow \quad t = 26.6$$

Rosetta

$$\theta = 1.11 \quad \Leftrightarrow \quad t = 4.1$$

For Galileo and Near we found the relation:

$$t = \frac{\sqrt{a^3 / GM}.\varepsilon^4}{28000}$$

For Cassini and Rosetta:

$$t = \frac{\sqrt{a^3 / GM}.\varepsilon^4}{4300} \quad ; \qquad \frac{28000}{4300} = 2\pi$$

But the value of t must be derived.

Units unification in S. I. system

Everything is made of speed and distance. Time doesn't exist in nature. There are only 3 distance dimensions.

Definition of mass

Wavelength of the electron: $x_e = 2.426 \times 10^{-12} m$

Light speed = c

Particular electron relations:

Electron charge -- $q_e \approx x_e^3 c^2$

Planck's constant -- $h \approx x_e^5 c^3$

Magnetic flux quantum -- $\Phi_0 \approx x_e^2 c$

Inverse permeability -- $\frac{1}{\mu_0} \approx x_e c^2$

Permittivity -- $\varepsilon_0 \approx x_e$

Electron energy -- $E \approx x_e^4 c^4$

Electron mass -- $m \approx x_e^4 c^2$

Boltzmann constant -- $k_B \approx x_e^2$

Using: distance = L and speed = V

So, the mass is equal: $M = L^4 V^2$

List of units

Mass -- $M = L^4 V^2$

Time -- $T = LV^{-1}$

Electric charge -- $q = L^3 V^2$

Electric dipole moment -- $d = qL = M = L^4 V^2$

The electric dipole moment is a mass.

Magnetic charge -- $q_m = \Phi_0 = \frac{h}{2q} = L^2 V$

Planck's constant -- $h = L^5 V^3$

Magnetic flux quantum -- $\Phi_0 = q_m = \sqrt{M}$

Inverse permeability = Density = Electric potential = $\frac{1}{\mu} = LV^2$

Magnetic current -- $I_m = LV^2$

Magnetic field -- $B = V$ (Magnetic flux density)

Electric field -- $E = V^2$

Electric current = Magnetic voltage -- $I = L^2 V^3$

Permittivity -- $\varepsilon = L$

Force -- $F = L^3 V^4$

Magnetic potential = Inverse resistance -- $A = \frac{1}{\Omega} = LV$

= Circulation

Gravitational constant -- $G = L^{-3}$

Pressure -- LV^4

Farad -- L^2

Henry -- V^{-2}

Energy -- $E = L^4 V^4$

Moment -- $L^4 V^3$

Watt -- $L^3 V^5$

Magnetic field strength -- $H = LV^3$

Electric flux -- $L^2 V^2 = \sqrt{Energy}$

Acceleration = Magnetic current density -- $a = J_M = L^{-1} V^2$

Energy -- $E = \left(\frac{\varepsilon}{\mu}\right)^2$

Electric current density -- $J_E = V^3$

Electric displacement field -- $D = \frac{1}{\mu} = LV^2$

Magnetic current -- $I_m = LV^2$

$$x_G = \frac{1}{\sqrt[3]{G}}$$

Boltzmann constant -- $k_B = L^2$

The temperature is an energy surface density:

$$T_k = \frac{E}{L^2} = L^2 V^4$$

For the Sun:

$T_k = 5800K$; Surface -- $S = 4\pi R^2 = 6 \times 10^{18} m^2$

Energy -- $E = ST_k = \underline{3.5 \times 10^{22} J}$

Power surface density at earth -- $P = 1.3 Wm^{-2}$

Total power for earth sun distance:

$$A = 4\pi D_{ES}{}^{2} = 2.8\times10^{23} m^{2}$$

$$P_T = 3.6\times10^{23} W \quad \text{---} \quad \underline{E = 3.6\times10^{23} J}$$

Units table

	L-1	L0	L	L2	L3	L4	L5
V-1	Thermal Resistance; Electric Resistance		Time; Inverse Frequency				
V0			Distance; Permittivity	Surface; Capacitance; Boltzmann Constant	Volume; Inverse Gravitational Constant		
V	Frequency; Vorticity	Speed; Magnetic Field	Magnetic Potential; Conductance; Circulation	Magnetic Charge; Magnetic Flux	True Magnetic Dipole Moment		
V2	Acceleration; Current Density	Electric Field; Inverse Inductance	Magnetic Current; Electric Voltage; Inverse Permeability	Electric Flux; Q.M. Probability	Electric Charge	Mass; Electric Dipole Moment	
V3	Sound Resistance	Electric Current Density; Potential Vorticity	Magnetic Field Strength	Magnetic Voltage; Electric Current		Momentum; False Magnetic Moment	Planck Constant; Angular Momentum
V4			Pressure; Energy Density	Temperature; Surface Tension	Force	Energy; Torque	
V5	Luminance	Spectral Irradiance	Intensity; Irradiance		Power		

The existence

There's the nothing.

But, if so, the nothing can't exists.

On the logical limit, if nothing exists the nothing can't exist.

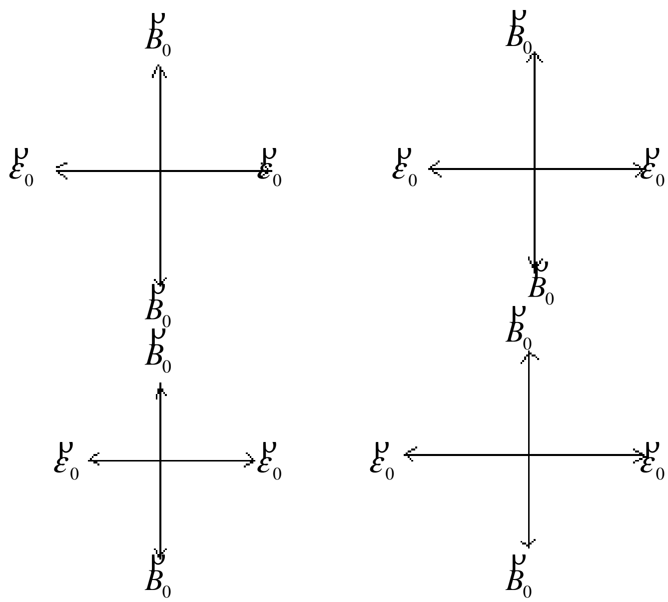
That means the nothing has an intrinsic instability, it can't allows the existence of it self, so the nothing perpetually oscillate between his symmetric components like $0 = (+1) + (-1)$. This oscillation with no initial energy is the existence.

So the sum that all that exists is equal to zero.

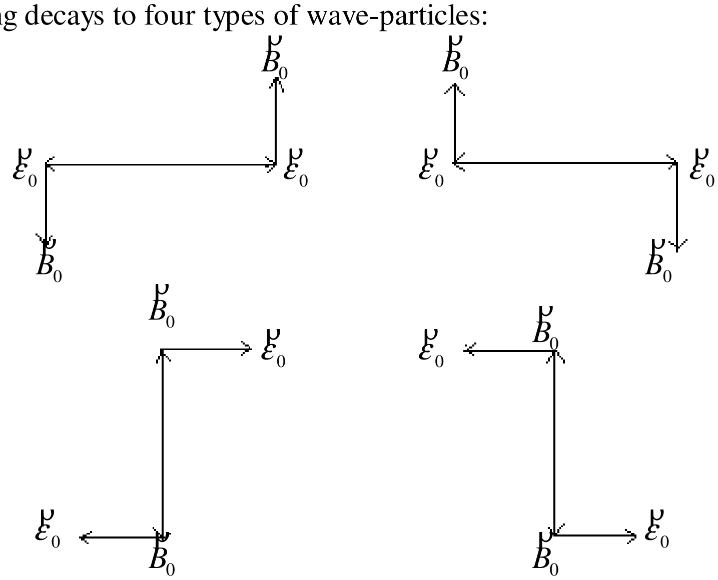
The nothing and everything

The existence exists forever.
The nothing and everything is made of two things: speed and distance.
Speed is equal to magnetic field and distance is equal to permittivity.

The nothing:



The nothing decays to four types of wave-particles:



The total speed and distance remains equal to zero as the energy.
Two particles has positive mass and the other two negative mass.

Two charged particles and two neutral.

At the surface of our universe

The title means that this is not the only one. The multiplicity of things is a law of the nature. Our universe can be just a simple subatomic particle of another mega universe.

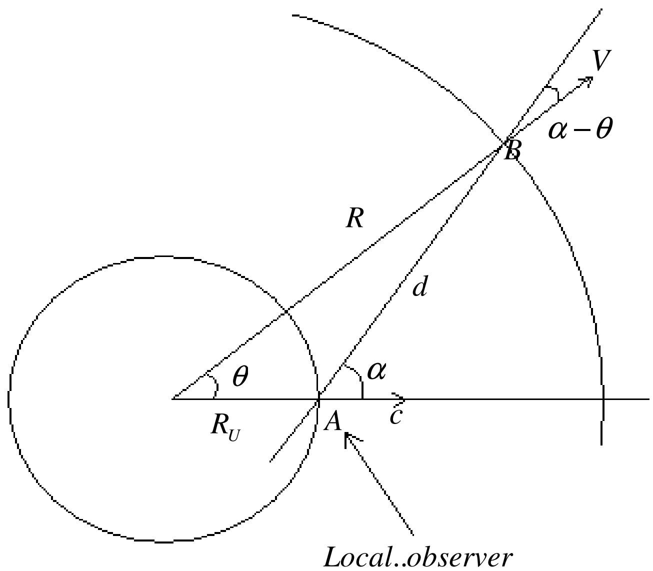
The orthodox physics states that the universe has no center, but this corresponds to another hidden centralistic view of our position, because when the physicists make the calculations, they always put us in the center of the "observable universe".

This universe has a center and we are not living at the center of it, we are living at the surface of our universe, just like we are living at the surface of the earth. It exists already a prove of that. The Hubble constant is not constant with the direction of observation.

We are living at the surface of a black hole that rotates at light speed.

Variable Hubble Constant in an Expanding Universe

The Hubble constant is variable with distance and celeste coordinates, because we are not living at the center of our universe. With a right measurement procedure we can find the location of the universe center.



We must fix a reference distance d:

$$d = \frac{R_U}{2} = 2.57\times10^{25} \quad ; \quad R_U = \text{Local universe radius} = 5.14\times10^{25}\,m$$

$$R = \sqrt{d^2 + R_U{}^2 + 2dR_U \cos\alpha}$$

$$\theta = Arc\sin\frac{d\sin\alpha}{R}$$

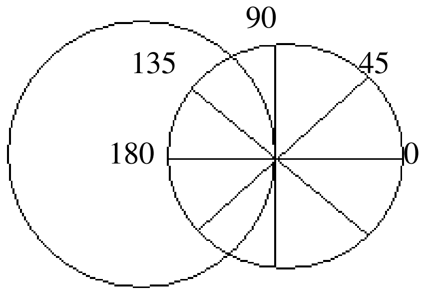
Relative expansion speed between A and B:

$$\Delta V = \sqrt{2Rg_U}\cos(\alpha-\theta) - c\cos\alpha$$

g_U = Universe acceleration = 8.74×10^{-10} ; c = light speed

Hubble frequency: $H = \dfrac{2\Delta V}{R_U}$

All sky observation:



$H_0 = 2.61 \times 10^{-18}$; Universe frequency -- $H_U = 2.91 \times 10^{-18} Hz$

$H_{45} = 3.66 \times 10^{-18}$

$H_{90} = 5.5 \times 10^{-18}$

$H_{135} = 5.4 \times 10^{-18}$

$H_{180} = 3.42 \times 10^{-18}$

In an accelerated expanding universe the Hubble constant is variable.

Rotating Universe

Our universe is eternal as all the existence, it has no beginning.

Hubble constant: $H_0 = 2.3 \times 10^{-18} Hz$

Local gravitational acceleration:

$$g_U = cH_0 = 6.9 \times 10^{-10}$$

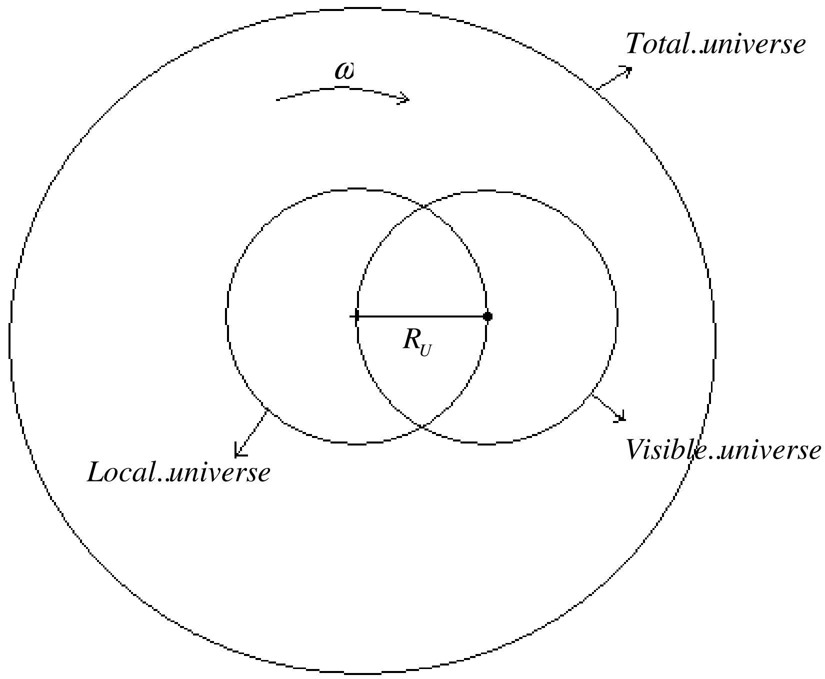
Our universe is rotating with a constant angular speed ω:

$\omega = 2\pi H_U$; $c = \omega R_U = 2\pi H_U R_U$

$H_U = \dfrac{H_0}{2\pi} = 3.66 \times 10^{-19}$ -- Frequency of the universe

The local orbital speed is equal to light speed.

R_U = Radius of the local universe



Universe period:

$$T_U = \frac{1}{H_U} = 2.73\times10^{18}s = 86.51Gy$$

Radius:

$$R_U = \frac{c}{H_0} = 1.3\times10^{26}m$$

The local orbital speed is light speed:

$$c^2 = \frac{GM_U}{R_U} \quad \Leftrightarrow \quad M_U = 1.76\times10^{53}kg$$

Some formulas:

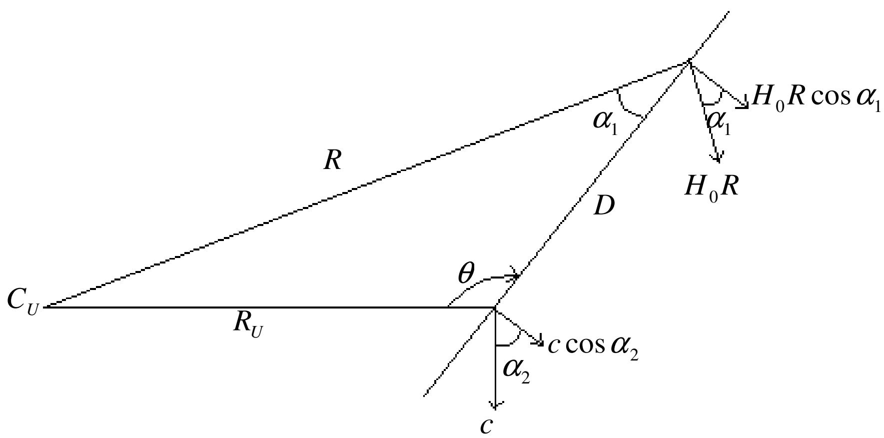
$$T_U = 2\pi\sqrt{\frac{R_U^{\ 3}}{GM_U}}$$

$$g_U = \frac{GM_U}{R_U^{\ 2}}$$

$$2\pi R_U = cT_U$$

Apparent linear expansion

The red shift is due to the relativistic dilatation of the wavelengths by transverse relative speed.



Relative longitudinal speed

$$v = H_0R\sin\alpha_1 - c\sin\alpha_2$$

$$v = H_0R\sin\alpha_1 - c\sin\theta \qquad \text{and} \qquad \sin\alpha_1 = \frac{R_U}{R}\sin\theta$$

$$v = H_0R_U\sin\theta - c\sin\theta \qquad \text{and} \qquad H_0R_U = c$$

$$\Leftrightarrow \qquad v = 0$$

Relative transverse speed

$$R = \sqrt{R_U^{\ 2} + D^2 - 2R_U D\cos\theta}$$

$$v = H_0 R\cos\alpha_1 - c\cos\alpha_2$$

$$R_U^{\ 2} = R^2 + D^2 - 2DR_U \cos\alpha_1 \qquad \Leftrightarrow \qquad \cos\alpha_1 = \frac{R^2 + D^2 - R_U^{\ 2}}{2RD}$$

$$v = H_0 \frac{R^2 + D^2 - R_U^{\ 2}}{2D} + c\cos\theta$$

$$v = H_0 (D - R_U \cos\theta) + c\cos\theta \qquad \Leftrightarrow$$

$$\Leftrightarrow \qquad v = DH_0$$

We found the Hubble law but this speed is transverse.

Transverse red shift

$$x_0 = \frac{cx}{\sqrt{c^2 - v^2}} \qquad \Leftrightarrow \qquad \frac{\Delta x_0}{x} = \frac{cv\Delta v}{(c^2 - v^2)^{3/2}}$$

v is the relative speed; $\Delta v = c - 0 = c$

$$\frac{\Delta x_0}{x} \approx \frac{v}{c}$$

For a local speed equal to c the transverse red shift behaves as a longitudinal red shift:

$$x_0 = x\frac{c + v}{c} \qquad \Leftrightarrow \qquad \frac{\Delta x_0}{x} = \frac{\Delta v}{c}$$

So, a rotating universe with a constant angular speed appears to be expanding.
In it the Hubble constant is precisely a constant.

Light dispersion in the interstellar medium and the Pulsar distance

Light dispersion in the interstellar medium of our galaxy, allow us to know the exact distance of Pulsars and other variable emission objects by measuring the time delay between light of different frequencies.

From Lorentz's equations:

$$\begin{cases} x = \dfrac{x_0 + vt_0}{\sqrt{1 - v^2/c^2}} \\ t = \dfrac{t_0 + vx_0/c^2}{\sqrt{1 - v^2/c^2}} \end{cases} \Leftrightarrow$$

$$\Leftrightarrow \qquad c^2t^2 - x^2 = c^2{t_0}^2 - {x_0}^2$$

For n relative frames:

$$c^2{t_1}^2 - {x_1}^2 = c^2{t_2}^2 - {x_2}^2 = \bullet\bullet\bullet = c^2{t_n}^2 - {x_n}^2 \qquad \Leftrightarrow$$

$$\Leftrightarrow \qquad c^2{t_n}^2 - {x_n}^2 = k \qquad \text{(Constant)}$$

t and x are the period and the wavelength of the light wave, and k must be different from zero since we know that light speed in the vacuum of our galaxy is variable with the frequency due to the existence of free electrons. c is the light speed in perfect vacuum.

Doing the propagation speed equal to:

$$w = \frac{x}{t} \qquad \text{and the frequency:} \qquad f = \frac{1}{t}$$

We get the general propagation speed formula:

$$w = \pm\sqrt{c^2 - kf^2}$$

The dispersion time delay between two different frequencies along the distance *D* is:

$$\Delta t = D\left(\frac{1}{w_A} - \frac{1}{w_B}\right) \qquad \Leftrightarrow$$

$$\Leftrightarrow \qquad \Delta t = \pm\frac{Dk\left(f_B{}^2 - f_A{}^2\right)}{2c^3}$$

The distance of the Pulsar is:

$$D = \frac{2c^3\left|\Delta t\right|}{k\left|f_B{}^2 - f_A{}^2\right|}$$

If *f* is the average frequency and *B* the bandwidth in Hertz, the distance in meter is (all S.I. units):

$$D = \frac{c^3 \Delta t}{kBf}$$

According with the data analysis we have done for a great number of Pulsars we found the relation:

$$kf^{3.7} = 3.7\times10^{20} \qquad \text{, so:}$$

$$D = 7.3\times10^4 \frac{\Delta t f^e}{B} \qquad ; \qquad (e = 2.71828)$$

This is the exact formula of the distance of a Pulsar or a variable star in our galaxy. The interstellar medium seems to be almost uniform. Outside of our galaxy this formula is not correct.

General formulas of light propagation in space

$$w = \sqrt{c^2 - kf^n}$$

$$\Delta w = \frac{-knf^{n-1}}{2c}\Delta f$$

$$w = \frac{D}{t} \quad ; \quad t = \frac{D}{c}$$

$$\Delta w = \frac{c^2}{D}\Delta t \quad \Leftrightarrow \quad D = \frac{2c^3\Delta t}{knf^{n-1}\Delta f}$$

In our galaxy:

$$n = -1.7 \quad ; \quad k = 2.7\times10^{20}$$

$$w = \sqrt{c^2 - 2.7\times10^{20} / f^{1.7}}$$

In intergalactic space:

$$n = -0.17 \quad ; \quad k = 1.8\times10^{9}$$

$$w = \sqrt{c^2 - 1.8\times10^{9} / f^{0.17}}$$

The meaning of the fine structure constant

Normally the fine structure constant is seen as a relation between electric and gravitic forces. As we are going to see that is not the true meaning as the forces must be equal.

The inverse of the fine structure constant is the number of times that the wavelength of the electron makes the perimeter of it orbit.

Angular momentum:

$$L = m_e v R = n\frac{h}{2\pi} \qquad \text{and} \qquad n = 1 \qquad \Leftrightarrow$$

$$\Leftrightarrow \qquad v = \frac{h}{2\pi R m_e}$$

Electric and centript forces between the proton and the electron:

$$F_c = \frac{m_e v^2}{R} = F_\varepsilon = \frac{q_e^{\ 2}}{4\pi\varepsilon_0 R^2}$$

$$\frac{m_e v^2}{R} = \frac{q_e^{\ 2}}{4\pi\varepsilon_0 R^2} \qquad \text{and} \qquad v = \frac{h}{2\pi R m_e} \qquad \Leftrightarrow$$

$$\Leftrightarrow \qquad R = \frac{h^2 \varepsilon_0}{\pi m_e q_e^{\ 2}} \qquad \text{and the electric energy is:}$$

$$E = \frac{q_e^{\ 2}}{8\pi\varepsilon_0 R} \qquad \text{so,}$$

$$E = \frac{m_e q_e^{\ 4}}{8\varepsilon_0^{\ 2} h^2} \qquad \text{and} \qquad \frac{E}{hc} = \frac{1}{\lambda}$$

We get the Rydberg constant, which is an experimental confirmed value:

$$R_M = \frac{m_e q_e^{\ 4}}{8\varepsilon_0^{\ 2} h^3 c} = 1.0974\times 10^7\, m^{-1}$$

So, the radius of the orbit of the electron is:

$$R = \frac{h^2 \varepsilon_0}{\pi m_e q_e^{\,2}} = 5.3 \times 10^{-11} m$$

And the speed:

$$v = \frac{h}{2\pi m_e R} = 2.2 \times 10^6 ms^{-1}$$

The wavelength of the electron is: $x_e = 2.426 \times 10^{-12} m$

We see that the perimeter:

$$\frac{1}{\alpha} x_e = 2\pi R \qquad \Leftrightarrow \qquad 137 x_e = 2\pi R$$

The value is not a perfect integer because the orbit is not perfectly circular.

Meaning of the wave function from quantum mechanics

The exact meaning of the wave function Ψ is not a probability amplitude but a magnetic potential *A*.

In the Schrodinger equation:

$$\frac{d\Psi}{dt} = -i2\pi f\Psi \qquad \text{and} \qquad \frac{d\Psi}{dx} = i\frac{2\pi}{\lambda}\Psi$$

The electric and magnetic fields from magnetic potential are:

$$\vec{E} = \frac{dA}{dt} \qquad \text{and} \qquad \vec{B} = \frac{dA}{dx}$$

If $\Psi = A$:

$$\begin{cases} \vec{E} = -i2\pi f\Psi \\ \vec{B} = i\dfrac{2\pi}{\lambda}\Psi \end{cases} \quad \Leftrightarrow \quad \frac{\vec{E}}{\vec{B}} = -\lambda f \quad \Leftrightarrow$$

$$\Leftrightarrow \quad \frac{\vec{E}}{\vec{B}} = -c \qquad \text{(Light speed)}$$

And we know that for an electromagnetic wave: $\dfrac{\vec{E}_M}{\vec{B}_M} = c$

So, **<u>THE WAVE FUNCTION IS A MAGNETIC POTENTIAL.</u>**

Speed of the Force from Absolute Relativity

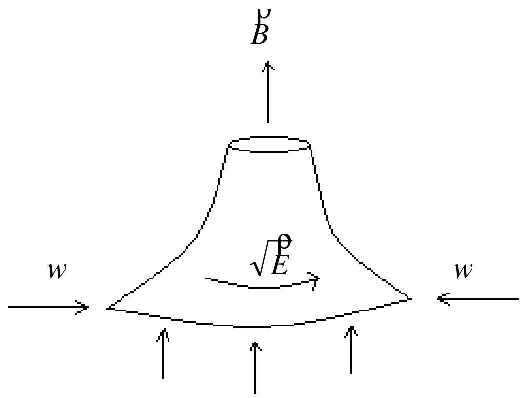
$$c^2t^2 - x^2 = k \quad \Leftrightarrow \quad x = \pm\sqrt{c^2t^2 - k} \quad \Leftrightarrow$$

$$V = \frac{dx}{dt} = \frac{c^2}{w} \qquad \text{and} \qquad w = \frac{x}{t} \quad \Leftrightarrow$$

$$\Leftrightarrow \quad V = \frac{dx}{dt} = \pm\frac{c^2 t}{x}$$

Vortex Particle Model

A true fundamental particle is a vortex of nothing, made of speed and distance.



The magnetic field $\vec{B}$ is a speed.
The electric field $\vec{E}$ is a squared speed.
Electric charge = $q_e = \vec{E} \times Volume$
Magnetic charge = $q_m = \vec{B} \times Area = Outflow$
Mass = $m = q_m{}^2$
Magnetic potential = A = Circulation = Γ

For the electron:

The reference length = $x_e = 2.4 \times 10^{-12} m$

$\vec{E}_e = 2.4 \times 10^{18} m^2 s^{-2}$
$\vec{B}_e = 7.9 \times 10^9 ms^{-1}$
$w_e \approx c$
$A = cx_e = 7.2 \times 10^{-4} m^2 s^{-1}$

From fluid mechanics:

$$v_T = \frac{\Gamma}{2\pi R} \qquad \Leftrightarrow \qquad \sqrt{\vec{E}} = \frac{A}{nx_e}$$

Astronomical Aberration

The Einstein's aberration formula is wrong and according to relativity theory aberration can't exist.

Einstein's aberration formula:

$$\cos\theta' = \frac{\cos\theta - v/c}{1 - \cos\theta . v/c}$$

Einstein's speed composition formula:

$$w' = c^2 \frac{w - v}{c^2 - vw}$$

So: $\cos\theta' = \frac{w'}{c}$ and $\cos\theta = \frac{w}{c}$

And $\cos\theta' = c\frac{w - v}{c^2 - vw}$

According to Einstein $w = c$ $\Leftrightarrow$

$\Leftrightarrow$ $\cos\theta' = 1$ $\Leftrightarrow$ $\theta' = 0$

There's no aberration.

Let's see the case that the star is on the zenith, as *v* and *w* make 90 degrees one vector must be imaginary:

$\cos\theta' = c\frac{w - v}{c^2 - vw}$ and $v = iV$

$\cos\theta' = c\frac{w - iV}{c^2 - iVw}$ $\Leftrightarrow$

$$\cos\theta' = c\frac{(wc^2 + V^2 w) + i(Vw^2 - Vc^2)}{c^4 + V^2 w^2} \qquad \Leftrightarrow$$

$$\cos\theta' = c\frac{\sqrt{(wc^2 + V^2 w)^2 + (Vw^2 - Vc^2)^2}}{c^4 + V^2 w^2}$$

According to Einstein $w = c \quad \Leftrightarrow$

$$\Leftrightarrow \qquad \cos\theta' = 1 \qquad \Leftrightarrow \qquad \theta' = 0$$

No aberration.

The classical value:

$$\theta' = artg\frac{v}{c} \qquad \text{and} \qquad v = 3\times10^4 ms^{-1}$$

$$\theta' = 20.6''$$

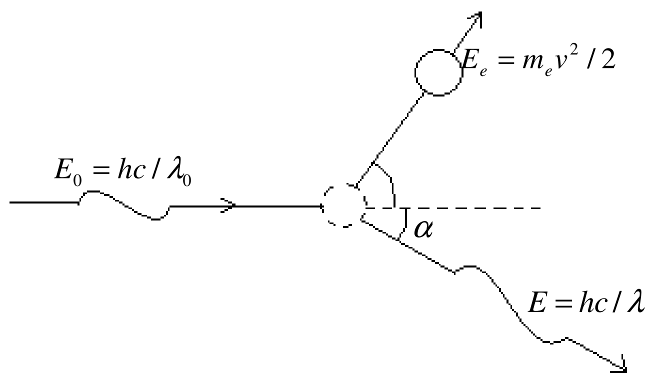
If light speed, according to Einstein, is not additive is obvious that, in Einstein's relativity theory, the aberration must be always zero. And we know that this is not true.

The Compton scattering is not a relativistic phenomena

The relativity theory believers brake, if it's necessary, all mathematical rules to prove that the theory is valid as for the Compton scattering. But the truth is only one: the Compton scattering is not a relativistic phenomena.

The Compton scattering phenomena

When a photon strikes a rest electron, the photon changes of direction and its wavelength increases (its energy decreases) and the electron gets some speed:



Empirical Compton formula:

$$\lambda = \lambda_0 + \frac{h}{m_e c}(1 - \cos\alpha)$$

Official and wrong relativistic derivation (Wikipédia)

Citation:

We use that:

$$E_\gamma + E_e = E_{\gamma'} + E_{e'}$$

(Conservation of energy, where E_γ is the energy of a photon before the collision and E_e is the energy of an electron before collision — its rest mass). The variables with a prime are used for those after the collision.
And:

$$\vec{p_\gamma} + \vec{p_e} = \vec{p_{\gamma'}} + \vec{p_{e'}}$$

(Conservation of momentum, with the $p_e = 0$ because we assume that the electron is at rest.)
We then use $E = hf = pc$:

$$\vec{p_{e'}} = \vec{p_\gamma} - \vec{p_{\gamma'}}$$
$$\vec{p_{e'}}^2 = (\vec{p_\gamma} - \vec{p_{\gamma'}})^2$$
$$\vec{p_{e'}}^2 = \vec{p_\gamma}^2 - 2 \cdot \vec{p_\gamma} \cdot \vec{p_{\gamma'}} + \vec{p_{\gamma'}}^2$$
$$\vec{p_{e'}} \cdot \vec{p_{e'}} = \vec{p_\gamma} \cdot \vec{p_\gamma} - 2 \cdot \vec{p_\gamma} \cdot \vec{p_{\gamma'}} + \vec{p_{\gamma'}} \cdot \vec{p_{\gamma'}}$$

$$p_{e'}{}^2 \cdot \cos(0) = p_\gamma^2 \cdot \cos(0) - 2 \cdot p_\gamma \cdot p_{\gamma'} \cdot \cos(\theta) + p_{\gamma'}^2 \cdot \cos(0)$$

The cos(θ) term appears because the momenta are spatial vectors, all of which lie in a single 2D plane, thus their inner product is the product of their norms multiplied by the cosine of the angle between them.

substituting p_γ with $\frac{hf}{c}$ and $p_{\gamma'}$ with $\frac{hf'}{c}$, we derive

$$p_{e'}^2 = \frac{h^2 f^2}{c^2} + \frac{h^2 f'^2}{c^2} - \frac{2h^2 f f' \cos\theta}{c^2}$$

Now we fill in for the energy part:

$$E_\gamma + E_e = E_{\gamma'} + E_{e'}$$
$$hf + mc^2 = hf' + \sqrt{(p_{e'}c)^2 + (mc^2)^2}$$

We solve this for $p_{e'}$:

$$(hf + mc^2 - hf')^2 = (p_{e'}c)^2 + (mc^2)^2$$

$$\frac{(hf + mc^2 - hf')^2 - m^2c^4}{c^2} = p_{e'}^2$$

Then we have two equations for $p_{e'}^2$, which we equate:

$$\frac{(hf + mc^2 - hf')^2 - m^2c^4}{c^2} = \frac{h^2 f^2}{c^2} + \frac{h^2 f'^2}{c^2} - \frac{2h^2 f f' \cos\theta}{c^2}$$

Now it's just a question of rewriting:

$$h^2 f^2 + h^2 f'^2 - 2h^2 f f' + 2h(f - f')mc^2 = h^2 f^2 + h^2 f'^2 - 2h^2 f f' \cos\theta$$

$$-2h^2 f f' + 2h(f - f')mc^2 = -2h^2 f f' \cos\theta$$

$$hff' - (f - f')mc^2 = hff' \cos\theta$$

$$hff'(1 - \cos\theta) = (f - f')mc^2$$

$$h\frac{c}{\lambda'}\frac{c}{\lambda}(1 - \cos\theta) = \left(\frac{c}{\lambda} - \frac{c}{\lambda'}\right)mc^2$$

$$h\frac{c}{\lambda'}\frac{c}{\lambda}(1-\cos\theta) = \left(\frac{c\lambda'}{\lambda\lambda'} - \frac{c\lambda}{\lambda'\lambda}\right)mc^2$$

$$h(1-\cos\theta) = \frac{\lambda'}{c}\frac{\lambda}{c}\left(\frac{c\lambda'}{\lambda'\lambda} - \frac{c\lambda}{\lambda\lambda'}\right)mc^2$$

$$h(1-\cos\theta) = \left(\frac{\lambda'}{c} - \frac{\lambda}{c}\right)mc^2$$

$$\frac{h}{mc}(1-\cos\theta) = \lambda' - \lambda$$

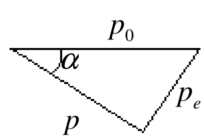
End of citation.
The introduction of $\cos\theta$ it's just a mathematical error.

Right derivation

Conservation of the energy: $E_0 = E + \frac{1}{2}m_e v^2$ and $m_e{}^2 v^2 = p_e{}^2$

$$E_0 = E + \frac{p_e{}^2}{2m_e} \quad \Leftrightarrow \quad p_e{}^2 = 2m_e(E_0 - E)$$

Conservation of the momentum:



$$p_e{}^2 = p^2 + p_0{}^2 - 2pp_0\cos\alpha$$

$$\Leftrightarrow \quad p^2 + p_0{}^2 - 2pp_0\cos\alpha = 2m_e(E_0 - E) \quad \text{and} \quad E_0 = p_0 c \quad \text{and} \quad E = pc$$

$$\Leftrightarrow \quad p^2 + p_0{}^2 - 2pp_0\cos\alpha = 2cm_e(p_0 - p) \quad \text{and} \quad p_0 = \frac{h}{\lambda_0} \quad \text{and} \quad p = \frac{h}{\lambda}$$

$$\Leftrightarrow \quad \lambda = \lambda_0\frac{h\cos\alpha - cm_e\lambda_0 - \sqrt{(h\cos\alpha - cm_e\lambda_0)^2 - h(h - 2cm_e\lambda_0)}}{h - 2cm_e\lambda_0}$$

This is the exact equation for Compton scattering. Finding, with a derivation, a empirical equation can be just a question of luck. As we prove, this equation is almost equivalent to the Compton one (the absolute relativity introduce some, not tested, little corrections):

For $m_e = 9.11 \times 10^{-31} kg$ and $\lambda_0 = 3 \times 10^{-10} m$

$\lambda_1 = Compton..value$; $\lambda_2 = our..value$

α	$\lambda_1 \times 10^{-10}$	$\lambda_2 \times 10^{-10}$
0	3.00000000	3.00000000
30	3.00325042	3.00325044
60	3.01213074	3.01213094
90	3.02426148	3.02426227
120	3.03639222	3.03639398
150	3.04527254	3.04527526
180	3.04852296	3.04852608

Evident errors of the theoretical basis of the relativity theory

This paper is based on the original Einstein's book – Relativity: the special and general theory. To the book citation we have added some commentaries about the existence of several evident errors in the derivations of the basis of the relativity theory. Curiously the relativistic physicians continue to state that the Lorentz's transformations verify the Einstein's postulates when it's possible to prove clearly the contrary.

We think, however, that the relativity theory is partially correct, as proves the experiments, but is necessary to reformulate its theoretical basis.

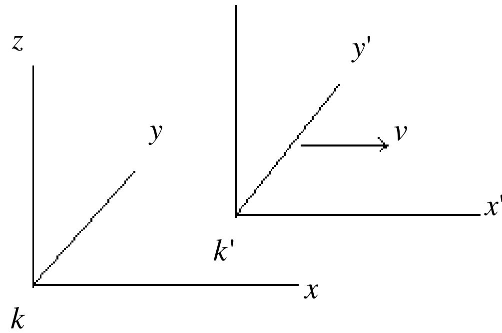
Relativity: the special and general theory

(The download of this book can be done at – Project Gutenberg)

APPENDIX I

SIMPLE DERIVATION OF THE LORENTZ TRANSFORMATION
(SUPPLEMENTARY TO SECTION 11)

z'



For the relative orientation of the co-ordinate systems indicated in Fig. 2, the x-axes of both systems permanently coincide. In the present case we can divide the problem into parts by considering first only events which are localised on the x-axis. Any such event is represented with respect to the co-ordinate system K by the abscissa x and the time t, and with respect to the system K1 by the abscissa x' and the time t'. We require to find x' and t' when x and t are given.

A light-signal, which is proceeding along the positive axis of x, is transmitted according to the equation

$$x = ct$$

or

$$x - ct = 0 \quad . \quad . \quad . \quad (1).$$

Since the same light-signal has to be transmitted relative to K1 with the velocity c, the propagation relative to the system K1 will be represented by the analogous formula

$$x' - ct' = O \quad . \quad . \quad . \quad (2)$$

Those space-time points (events) which satisfy (x) must also satisfy (2). Obviously this will be the case when the relation

$$(x' - ct') = l\,(x - ct) \quad . \quad . \quad . \quad (3).$$

is fulfilled in general, where l indicates a constant; for, according to (3), the disappearance of (x - ct) involves the disappearance of (x' - ct').

If we apply quite similar considerations to light rays which are being transmitted along the negative x-axis, we obtain the condition

$$(x' + ct') = \mu(x + ct) \quad . \quad . \quad . \quad (4).$$

By adding (or subtracting) equations (3) and (4), and introducing for convenience the constants a and b in place of the constants l and μ, where

$$a = \frac{\lambda + \mu}{2}$$

and

$$b = \frac{\lambda - \mu}{2}$$

we obtain the equations

$$\left.\begin{aligned} x^1 &= ax - bct \\ ct^1 &= act - bx \end{aligned}\right\} \quad . \quad . \quad . \quad (5).$$

We should thus have the solution of our problem, if the constants a and b were known. These result from the following discussion.

For the origin of K1 we have permanently x' = 0, and hence according to the first of the equations (5)

$$x = \frac{bc}{a} t$$

If we call v the velocity with which the origin of K1 is moving relative to K, we then have

$$v = \frac{bc}{a} \qquad (6).$$

(Commentary:

We consider that all theoretical argumentation used by Einstein is wrong from the beginning but, for not permitting any doubts we only concentrate on the mathematical evident errors.

If $x' = 0 \quad \Leftrightarrow \quad ax - bct = 0 \quad \Leftrightarrow \quad x = \frac{bc}{a} t$

But $x' = ct'$ **so** $ct' = 0$

From the second equation (5) $act - bx = 0 \quad \Leftrightarrow \quad x = \frac{ac}{b} t$

Equelling both equations $\frac{bc}{a} t = \frac{ac}{b} t \quad \Leftrightarrow \quad a = b$

As $v = \frac{bc}{a} \quad \Leftrightarrow \quad v = c$

So this result doesn't allow the derivation of the Lorentz's transformations.

Or still $x = \frac{bc}{a}t$ **and** $v = \frac{bc}{a}$ ⇔ $x = vt$

But $x = ct$ **so** $v = c$

Let's ignore this result and continue with the citation.)

The same value v can be obtained from equations (5), if we calculate the velocity of another point of K1 relative to K, or the velocity (directed towards the negative x-axis) of a point of K with respect to K'. In short, we can designate v as the relative velocity of the two systems.

Furthermore, the principle of relativity teaches us that, as judged from K, the length of a unit measuring-rod which is at rest with reference to K1 must be exactly the same as the length, as judged from K', of a unit measuring-rod which is at rest relative to K. In order to see how the points of the x-axis appear as viewed from K, we only require to take a "snapshot "of K1 from K; this means that we have to insert a particular value of t (time of K), e.g. t = 0. For this value of t we then obtain from the first of the equations (5)

x' = ax

Two points of the x'-axis which are separated by the distance Dx' = I when measured in the K1 system are thus separated in our instantaneous photograph by the distance

$$\Delta x = \frac{I}{a} \quad . \quad . \quad . \quad (7).$$

But if the snapshot be taken from K'(t' = 0), and if we eliminate t from the equations (5), taking into account the expression (6), we obtain

$$x^1 = a\left(I - \frac{v^2}{c^2}\right)x$$

From this we conclude that two points on the x-axis separated by the distance I (relative to K) will be represented on our snapshot by the distance

$$\Delta x^1 = a\left(I - \frac{v^2}{c^2}\right) \quad . \quad . \quad . \quad (7a).$$

But from what has been said, the two snapshots must be identical; hence Dx in (7) must be equal to Dx' in (7a), so that we obtain

$$a = \frac{I}{I - \frac{v^2}{c^2}} \quad . \quad . \quad . \quad (7b).$$

(Commentary:

One more time we consider that all ideological argumentation is just a big confusion. Lets concentrate on mathematical expressions:

$t=0$ **and** $x'=ax-bct \Leftrightarrow x'=ax$

but $x=ct$ **so** $x=0 \Leftrightarrow x'=0$

as $ct'=act-bx$ **so** $t'=0 \Leftrightarrow$

$$\Leftrightarrow \quad a=\frac{0}{0}$$

Again and again Einstein ignore his initial statement $x=ct$ **and** $x'=ct'$**. Let's ignore this error.**

$t=0 \Leftrightarrow x'=ax \Leftrightarrow \Delta x=\frac{\Delta x'}{a}$

but $\Delta x'=1 \Leftrightarrow \Delta x=\frac{1}{a}$

also $t'=0$ **and** $ct'=act-bx \Leftrightarrow t=\frac{bx}{ac}$

$t=\frac{bx}{ac}$ **and** $x'=ax-bct \Leftrightarrow x'=ax\left(1-\frac{b^2}{a^2}\right)$

but $v=\frac{bc}{a} \Leftrightarrow \frac{b}{a}=\frac{v}{c}$ **so** $x'=ax\left(1-\frac{v^2}{c^2}\right)$

thus $\Delta x'=a\left(1-\frac{v^2}{c^2}\right)\Delta x$

but $\Delta x=1 \Leftrightarrow \Delta x'=a\left(1-\frac{v^2}{c^2}\right)$

therefore as $\Delta x = 1$ **and** $\Delta x = \frac{1}{a}$ $\Leftrightarrow$ $a = 1$

as $\Delta x' = 1$ $\Leftrightarrow$ $v = 0$

Again we didn't reach the derivation of the Lorentz's transformations. Einstein also states that $\Delta x' = \Delta x$**, but we all know that**

$$\Delta x' = \Delta x \sqrt{1 - \frac{v^2}{c^2}}$$

Lets continue)

The equations (6) and (7b) determine the constants a and b. By inserting the values of these constants in (5), we obtain the first and the fourth of the equations given in Section 11.

$$\left.\begin{aligned} x' &= \frac{x - vt}{\sqrt{1 - \frac{v^2}{c^2}}} \\ t' &= \frac{t - \frac{v}{c^2}x}{\sqrt{1 - \frac{v^2}{c^2}}} \end{aligned}\right\} \quad . \quad . \quad . \quad (8).$$

Thus we have obtained the Lorentz transformation for events on the x-axis. It satisfies the condition

x'2 - c^2t'2 = x2 - c^2t2 . . . (8a).

The extension of this result, to include events which take place outside the x-axis, is obtained by retaining equations (8) and supplementing them by the relations

$$\left.\begin{aligned} y' &= y \\ z' &= z \end{aligned}\right\} \quad . \quad . \quad . \quad (9).$$

In this way we satisfy the postulate of the constancy of the velocity of light in vacuum for rays of light of arbitrary direction, both for the system K and for the system K'. This may be shown in the following manner.

We suppose a light-signal sent out from the origin of K at the time t = 0. It will be propagated according to the equation

$$r = \sqrt{x^2 + y^2 + z^2} = ct$$

or, if we square this equation, according to the equation

$$x^2 + y^2 + z^2 = c^2t^2 = 0 \quad . \quad . \quad . \quad (10).$$

It is required by the law of propagation of light, in conjunction with the postulate of relativity, that the transmission of the signal in question should take place -- as judged from K1 -- in accordance with the corresponding formula

$$r' = ct'$$

or,

$$x'^2 + y'^2 + z'^2 - c^2t'^2 = 0 \quad . \quad . \quad . \quad (10a).$$

In order that equation (10a) may be a consequence of equation (10), we must have

$$x'^2 + y'^2 + z'^2 - c^2t'^2 = s\,(x^2 + y^2 + z^2 - c^2t^2) \qquad (11).$$

Since equation (8a) must hold for points on the x-axis, we thus have s = I. It is easily seen that the Lorentz transformation really satisfies equation (11) for s = I; for (11) is a consequence of (8a) and (9), and hence also of (8) and (9). We have thus derived the Lorentz transformation.

The Lorentz transformation represented by (8) and (9) still requires to be generalised. Obviously it is immaterial whether the axes of K1 be chosen so that they are spatially parallel to those of K. It is also not essential that the velocity of translation of K1 with respect to K should be in the direction of the x-axis. A simple consideration shows that we are able to construct the Lorentz transformation in this general sense from two kinds of transformations, viz. from Lorentz transformations in the special sense and from purely spatial transformations, which corresponds to the replacement of the rectangular co-ordinate system by a new system with its axes pointing in other directions.

Mathematically, we can characterise the generalised Lorentz transformation thus:

It expresses x', y', x', t', in terms of linear homogeneous functions of x, y, x, t, of such a kind that the relation

$$x'^2 + y'^2 + z'^2 - c^2t'^2 = x^2 + y^2 + z^2 - c^2t^2 \qquad (11a).$$

is satisfied identically. That is to say: If we substitute their expressions in x, y, x, t, in place of x', y', x', t', on the left-hand side, then the left-hand side of (11a) agrees with the right-hand side.

(Commentary:

$$\begin{cases} x' = \dfrac{x - vt}{\sqrt{1 - v^2/c^2}} \\ t' = \dfrac{t - vx/c^2}{\sqrt{1 - v^2/c^2}} \end{cases} \quad \textbf{removing v} \quad \Leftrightarrow \quad x'^2 - c^2t'^2 = x^2 - c^2t^2$$

$$x = ct \quad \Leftrightarrow \quad x^2 - c^2t^2 = 0 \qquad \textbf{and} \qquad x' = ct' \quad \Leftrightarrow \quad x'^2 - c^2t'^2 = 0$$

$$\textbf{or} \quad t = \frac{x}{c} \quad \textbf{and} \quad t' = \frac{x'}{c}$$

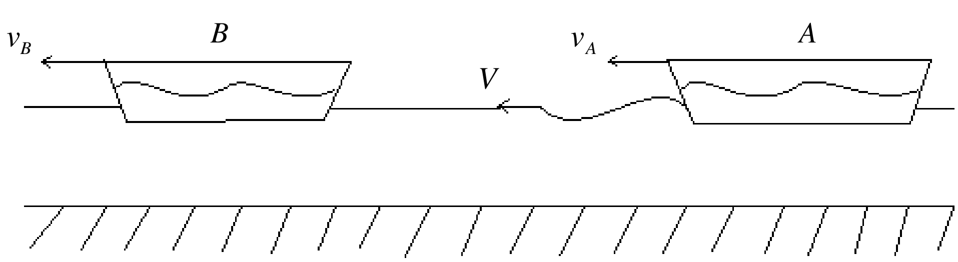
that means, the time t is a function of x and not an independent coordinate as appears in the expression of the space-time:

$$\begin{cases} x^2 + y^2 + z^2 - c^2t^2 = 0 \\ x = ct \end{cases} \quad \Leftrightarrow \quad y^2 + z^2 = 0$$

Thus, we prove that the space-time equation is an error, because that equation states that the time is independent of the space. If time is a function of the space, some thing is wrong.)

Water and light waves

Light waves behaves exactly like water surface waves.



We have a boat A moving at the water surface with velocity v_A relative to the water. Inside the boat there's water and the observer A measures the constant speed V. The velocity of the wave in the water out of the boat remains V so there's no addition of speeds.

The relative velocity between the wave and the boat is $V - v_A$ but the observer in the boat can't measure this speed.

Any observer stopped relative to the water always measures a constant speed V.

If there's a moving receptor, boat B, moving with speed v_B the relative speed of the wave to the boat is $V - v_B$ but the B observer can't measure this speed.

Inside the boat B there's water too and inside the boat the observer measure a constant speed V.

The speed of the wave inside the boat B relative to the water is $V + v_B$.

Light behaves exactly the same way.

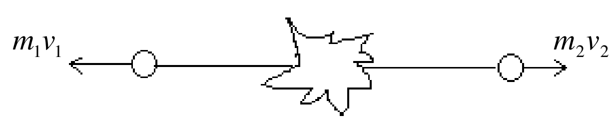
For light the $V + v_B$ speed becomes $c^2 \dfrac{V + v_B}{c^2 + Vv_B}$ if the speed is frequency dependent and because the frequency changes between the water out and inside the boat.

So, the relatives $V \pm v$ speeds exists at the same time that the propagation speed remains constant. Many times the Lorentz's formula is used on a wrong way.

There are no mysteries in the universe.

Classical Entanglement

Two particles from an explosion travel in opposite ways:



The equation of the entangle momentum is:

$$p_1 + p_2 = 0 \quad \Leftrightarrow \quad m_1v_1 + m_2v_2 = 0$$

They are entangled. If we measure the momentum of one we know the momentum of the other.

If we change the value of ones momentum, the other stays the same. The same as quantum entanglement. The no information law says that we can not put the second particle in a precise state that can be measured.

So, what's the problem?

The problem is that in quantum mechanics we suppose that the measure sets the state. So we are setting the state of the second particle at a big distance and instantaneous.

Is very simple to solve this. The particles have a definitive state even after measurement. How is possible that we believe that a particular abstract formula predicts all the information about a wave-particle. It's obvious that there are hidden variables that Schrodinger formula doesn't care with.

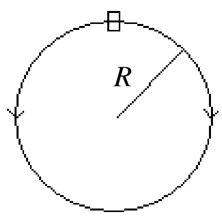
All the weirdness's of quantum mechanics are interpretation errors.

The nature has no paradoxes. Theories with paradoxes must be wrong.

The quantum mechanics is not a theory but a calculation method that for obtain any objective solution needs always the help of the classical mechanics.

Sagnac effect

According to the Lorentz's formulas (we impose that light speed c is constant because those formulas don't have that property):



$x_0 = 2\pi R \qquad v = \omega R$

$$x^+ = \frac{x_0 + vt_0}{\sqrt{1 - v^2/c^2}} \quad ; \quad x^- = \frac{x_0 - vt_0}{\sqrt{1 - v^2/c^2}} \quad \Leftrightarrow \quad \Delta x_R = \frac{2vt_0}{\sqrt{1 - v^2/c^2}}$$

And $t_0 = \frac{x_0}{c} = \frac{2\pi R}{c} \quad \Leftrightarrow \quad \boxed{\Delta x_R = \frac{4\pi R v}{\sqrt{c^2 - v^2}}}$

As $\Delta t = \frac{\Delta x}{c} \quad \Leftrightarrow \quad \boxed{\Delta t_R = \frac{4\pi R v}{c\sqrt{c^2 - v^2}}}$

According to classical view (light speed c is variable):

$$t^+ = \frac{2\pi R}{c - v} \quad ; \quad t^- = \frac{2\pi R}{c + v} \quad \Leftrightarrow \quad \boxed{\Delta t_C = \frac{4\pi R v}{c^2 - v^2}}$$

As $\Delta x = c\Delta t \quad \Leftrightarrow \quad \boxed{\Delta x_C = \frac{4\pi R c v}{c^2 - v^2}}$

It's almost impossible to measure the difference between the classical and the relativistic values. As, $\Delta t_R \approx \Delta t_C$ the Sagnac effect proves nothing.

Velocimeter of gravitational reference

This paper consists on a description of an experiment, with a special interferometer, to measure the speed of a vehicle, with the device inside, relatively to the Earth gravitational field.

We want to prove that the two basic postulates of the relativity theory are wrong:

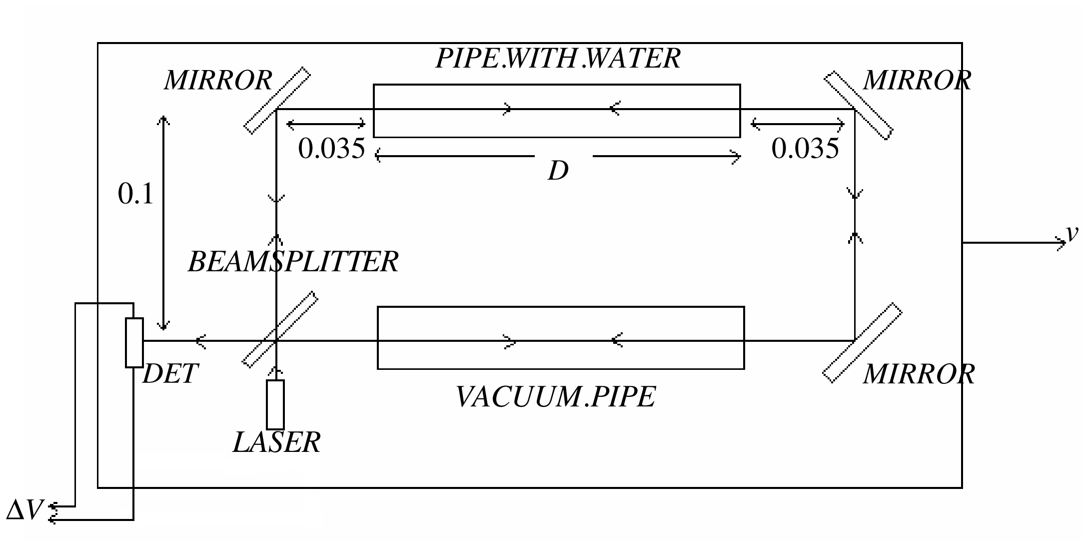
1st postulate – "we can't distinguish the state of uniform movement from the rest in a closed lab with any kind of experiment done inside it"

But there are no closed labs for gravity. If the ether is the Earth gravitational field it's possible to measure the speed relatively to it. This hypothesis is coherent with the results of the Michelson's experiment. Contrary to what is thought the Michelson's experiment gives the same result if the ether exists and is stopped relatively to the Earth, what is the case if it is the gravitational field of the Earth.

2nd postulate -- "the speed of light is constant and doesn't depend of the movement of the emitter or the receptor ".

As proves the phenomenon of astronomic aberration the light has relative speed. Our experiment proves that the light speed is additive as all others.

Experiment description



The device has a laser diode ($\lambda = 6.5\times10^{-7}\,m$, $P = 3.5mW$), a 50% - 50% beam splitter, three mirrors, a pipe filled of water with two glass windows, another one with vacuum and a light detector DET.

The laser beam is divided on the splitter and travels in two directions in the mirrors circuit. Then they are joined again and went to the detector where the variable interference pattern generates the voltage ΔV .

The entire device is protected from visible light and infrareds by a metallic box.

Times of the light rays:

Inside the vacuum tube, if the light propagates in the earth gravitational field, one way the speed will be $c+v$ and the other way $c-v$:

$$\begin{cases} t_1 = k + \dfrac{D}{w} + \dfrac{D}{c-v} \\ t_2 = k + \dfrac{D}{w} + \dfrac{D}{c+v} \end{cases} \quad \text{and} \quad t = t_1 - t_2$$

$$t = \frac{2Dv}{c^2} \quad ; \quad D = 0.33m \quad ; \quad t = 7.34\times10^{-18}\,v$$

Space phase shift:

$$\Delta t = 7.34 \times 10^{-18} \Delta v \quad \text{and} \quad \Delta x = c \Delta t \quad \Leftrightarrow \quad \Delta x = 2.2 \times 10^{-9} \Delta v$$

Voltage variation on the detector:

$$\Delta V = V \frac{\Delta x}{\lambda / 2} \quad \text{with} \quad \lambda = 6.5 \times 10^{-7} m \quad \Leftrightarrow$$

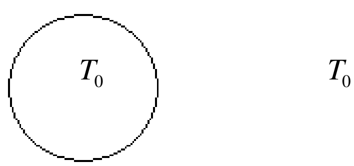
$$\Leftrightarrow \quad \Delta V = V \times 6.8 \times 10^{-3} \Delta v$$

In our device $V = 46mV$, so for a $\Delta v = 100 km/h = 27.8 m/s$:

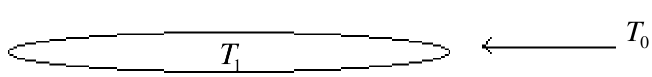
$$\underline{\Delta V = 8.7 mV} \quad ; \quad \frac{\Delta V}{V} = 19\%$$

Variable Surface Machine

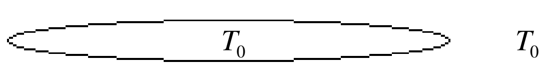
If the temperature is an energy surface density we can get work by changing the surface of a body.
We can do that by controlling electrically and magnetically the shape of a mercury body or a plasma.



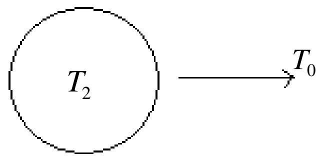
Changing the shape the temperature also changes: $T = \frac{E}{A}$



$T_1 < T_0$



Changing the shape again:



$$T_2 > T_0$$

Michelson experiment and other things

The Michelson experiment was made for detecting the relative speed of the experimental device to the vacuum. We know that the earth is moving in the space so, if the light speed is relative, we can be able to detect this movement.

So, is necessary that the light in the device propagates in the vacuum. But that is impossible at earth surface because the light moves in the earth gravitational field that is at rest relatively to the device.

But there's another problem with the experiment. The light is not moving in the vacuum neither in the earth gravitational field, **it is moving in the air**.

How can we detect the movement relatively to the vacuum if the light propagates in the air.

And this experiment is the only experimental basis for light speed constancy.

That's the problem with null result experiments. The experiment can be wrong and we still get the expected result.

Dark matter

Theorical mass of the universe:

$$M_U = 1.76 \times 10^{53} kg$$

Observed mass of the universe:

$$M_O = 3 \times 10^{52} \qquad (17\%)$$

We think that the dark energy doesn't exist, but in any case it has no mass.

Number of neutrinos in the universe:

$$n = 1 \times 10^{88}$$

Average mass of the tree types of the neutrinos:

$$\frac{M_U - M_O}{n} = 1.5 \times 10^{-35}$$

The electron neutrino mass:

$$m_{ve} = 4 \times 10^{-36}$$

The muon and tau neutrinos have greater masses.

Temperature

The temperature is an energy surface density:

$$T = \frac{E}{A}$$

But the area is always relative to a sphere:

$$A = 4\pi R^2$$

Volume: $V = \frac{4}{3}\pi R^3$, so:

$$T = \frac{E}{\sqrt[3]{36\pi . V^2}}$$

For the energy of the sun at the earth distance for an object located in the vacuum:

$$T = 0.29 \frac{E}{\sqrt[3]{36\pi . V^2}}$$

Monopole – the only elementary particle

We see electrons coming from the nucleus – beta decay, and see electrons entering the nucleus – electron capture. Is it correct that they can't exist inside the nucleus?

Centript force of the electron:

$$F = \frac{m_e v^2}{R}$$

Electric force for hydrogen:

$$F = \frac{1}{4\pi\varepsilon_0} \frac{q_e^{\ 2}}{R^2}$$

If light speed is a limit (approximation):

$$\frac{m_e c^2}{R} = \frac{q_e^{\ 2}}{4\pi\varepsilon_0 R^2} \qquad \Leftrightarrow \qquad R = \frac{q_e^{\ 2}}{4\pi\varepsilon_0 m_e c^2}$$

$$\Leftrightarrow \qquad R = 2.8\times10^{-15}\, m$$

The proton radius:

$$x = 1.3\times10^{-15}\, m$$

So, it seems that the electron can't exist inside the nucleus, but from the point of view of the proton:

The mass of the electron becomes infinite $\qquad m_e = \dfrac{m_{0e}}{(1-v^2/c^2)^{3/2}}$

The charge of the electron becomes infinite $\qquad q_e = \dfrac{q_{0e}}{1-v^2/c^2}$

Cutting the infinites:

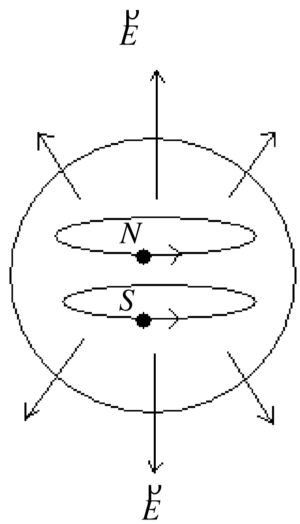
$$R = \frac{q_e}{4\pi\varepsilon_0 c^2} \qquad \Leftrightarrow \qquad R = 1.6\times10^{-26}$$

So, the electrons can exist inside of the nucleus.
The gravitational force is also infinite.

The two monopoles electron

A rotating monopole creates an electric field.

$$\vec{E} = \frac{q_m v}{R^2} = c^2$$



The electron is made of two symmetric monopoles rotating at the same axis.

Binding energy of the monopoles:

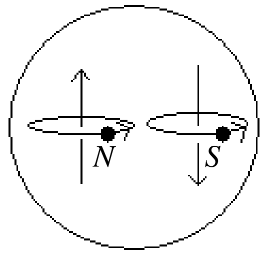
$$E = \frac{q_m^{\ 2}}{\mu_0 x_0} = 26.4 TeV$$

$q_m = \frac{h}{2q_e} = 2.1 \times 10^{-15}$ ($Tm^2 = Wb$) – Magnetic charge

$\mu_0 =$ Vacuum permeability

$x_0 = 8 \times 10^{-19} m$ -- Monopole wavelength

The neutrino



The neutrino is made of two symmetric monopoles with parallel axis.

Sun's Corona Temperature Problem

The real problem is not the corona high temperature but instead the low temperature of the surface.
The surface temperature is 3100 times lower that it should be.

At earth in vacuum space:

Temperature -- $T_E = 393K$

Distance -- $D_E = 1.5\times10^{11} m$

Total energy -- $E = 3.9\times10^{26} J$

Surface of the sphere -- $A_E = 4\pi.D_E{}^2$

$$T_E = \frac{1}{3.5}\frac{E}{A_E}$$

At the average corona:

$T_C = 5\times10^6 K$

$D_C = 1.3\times10^9 m$

$E = E$

$$A_C = 2.2 \times 10^{19} m^2$$

$$T_C = \frac{1}{3.5} \frac{E}{A_C}$$

At the Sun's surface:

$$T_S = 5780K$$

$$D_S = 7 \times 10^8 m$$

$$A_S = 6.2 \times 10^{18} m^2$$

$$E = E$$

$$T_S = \frac{1}{3.5} \frac{E}{A_S} \frac{B_T}{B_S} \frac{1}{31}$$

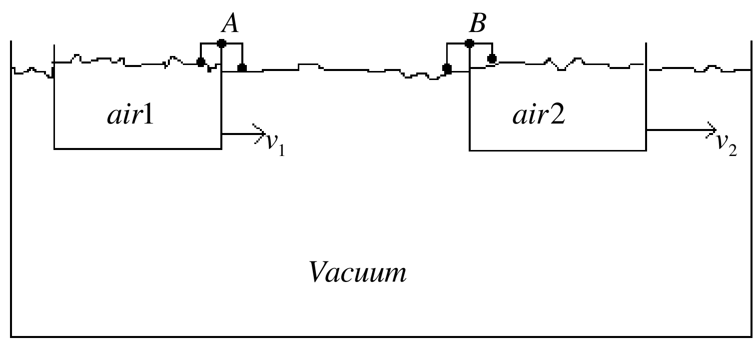
Earth magnetic field: $B_T = 40 \mu T$

Sun " " : $B_S = 100 B_T$

So, we think that the low temperature of the surface is due to the high magnetic field of the sun at the surface. And there's a factor of 31 due to the fractal surface of the sun, the real surface is 31 times greater then the surface of a sphere.

Several speeds

Light behaves like water waves.



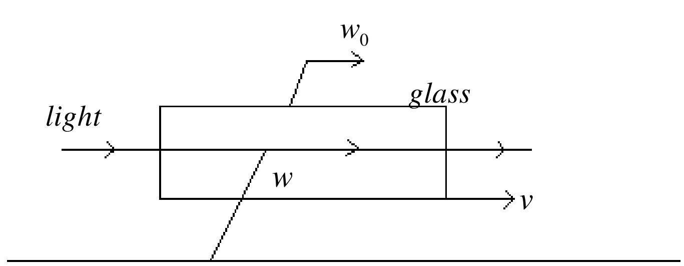
The speed in air1 is almost c.

If air1 moves the transversal transmitter A produces a shift $\sqrt{c^2 - v_1^2}/c$. But the speed v1 is not transmitted to the vacuum waves. There's also a Doppler shift.

The relative speed of the waves in vacuum to air2 is $c - v_2$. But this speed is impossible to be measured by an observer inside air2. The only way is by observing the aberration.

In air2 the shifted wave has the speed almost c.

One other speed:



$$w = c^2 \frac{w_0 + v}{c^2 + v w_0}$$

The Sagnac speed according Wikipedia:

$$V = c \pm R\omega$$

But they forgot that $R\omega = v$, a linear velocity.

So, in a inertial system the light speed can be $c \pm v$

Infinity is Equal to Zero

Hypothesis:

$$0 = +\infty \qquad \Leftrightarrow$$

$$\Leftrightarrow \qquad \log 0 = \log(+\infty) \qquad \Leftrightarrow$$

$$\Leftrightarrow \qquad -\infty = +\infty \qquad \Leftrightarrow$$

$$\Leftrightarrow \qquad \log(-\infty) = \log(+\infty) \qquad \Leftrightarrow$$

$$\Leftrightarrow \qquad \log(-1) + \log(+\infty) = +\infty \qquad \Leftrightarrow$$

$$\Leftrightarrow \qquad i\pi + \infty = \infty \qquad \Leftrightarrow$$

$$\Leftrightarrow \qquad \infty = \infty$$

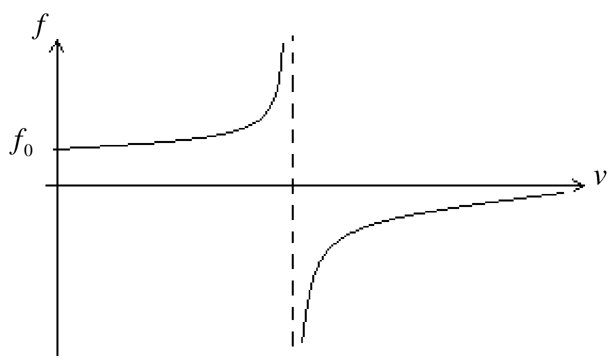
So, we have proved that infinity is equal to zero.

How nature deals with mathematical infinites

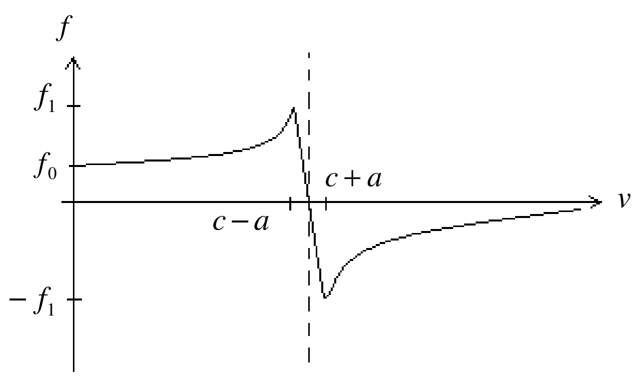
Doppler effect for sound:

$$f = f_0 \frac{c}{c - v} \qquad \text{(Frequency means energy)}$$

Mathematical graphic



Real graphic



$$y = mv + f_n \qquad \Leftrightarrow \qquad y = -\frac{f_1}{a}(c - v)$$

The real graphic gives a simple explanation for the double sonic boom.

Variation of the Refractive Index with Frequency

Lorentz's equations:

$$w = c^2 \frac{w_0 + v}{c^2 + v w_0} \quad ; \quad f = f_0 \frac{c\sqrt{c^2 - v^2}}{c^2 + v w_0}$$

$$dw = c^2 \frac{c^2 - v^2}{(c^2 + v w_0)^2} dw_0 \quad ; \quad \frac{c^2 - v^2}{(c^2 + v w_0)^2} = \frac{f^2}{c^2 f_0^{\,2}}$$

This is an approximation because v is a function of w_0, but for visible light $v \approx -c$ almost constant.

$$dw = \frac{f^2}{f_0^{\,2}} dw_0 \quad ; \quad f^2 = \frac{c^2 - w^2}{k} \quad ; \quad f_0^{\,2} = \frac{c^2 - w_0^{\,2}}{k}$$

$$\frac{dw}{c^2 - w^2} = \frac{dw_0}{c^2 - w_0^{\,2}} \quad \Leftrightarrow$$

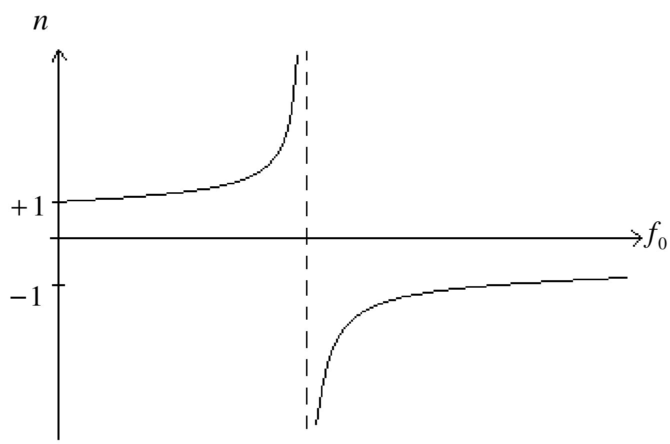
$$\Leftrightarrow \quad \log\left|\frac{c + w}{c - w}\right| = \log\left|\frac{c + w_0}{c - w_0}\right| + \log A$$

$$w = c \frac{A(c + w_0) - (c - w_0)}{A(c + w_0) + (c - w_0)}$$

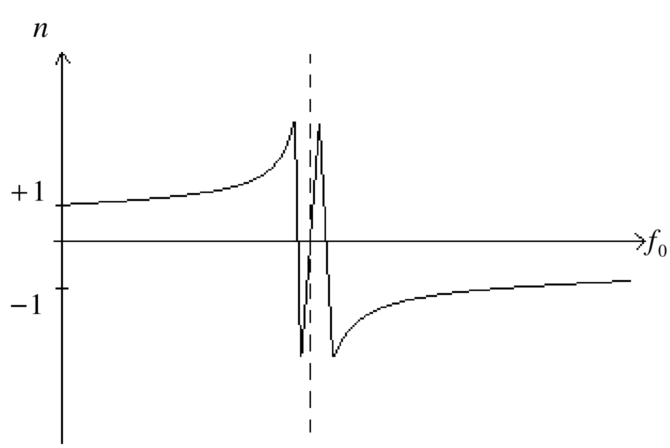
$$w_0 \approx c \quad ; \quad c - w_0 \approx \frac{k f_0^{\,2}}{2c} \quad ; \quad n = \frac{c}{w}$$

Refractive Index

$$n = \frac{B + f_0^{\,2}}{B - f_0^{\,2}} \qquad ; \qquad B \text{ is an experimental constant.}$$



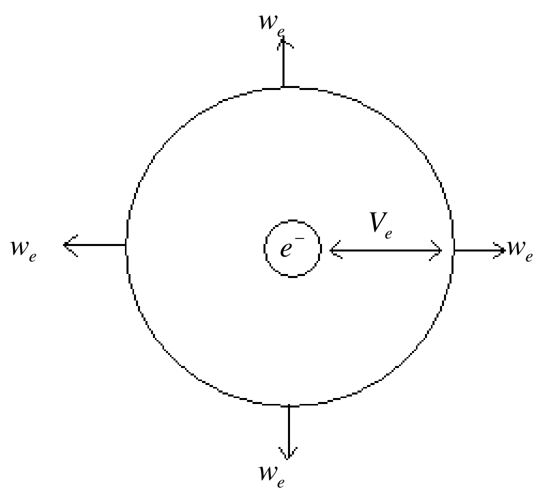
Real graphic at slow light experiments



Mathematical infinites don't exist in nature.
We have proved that Lorentz's equations admit speeds different then light speed.

The Speed of the Forces

The particles are not waves. They are localized wave emitters.



For the electron: $w_e = c - 5.1 \times 10^{-5} ms^{-1}$

This speed is variable with the distance generating an acceleration field.
The interactions with the waves transmit to the particle, telling it where to go.

The oscillating centre can be divided, for example, on two half particles that passes an obstacle and then reconstructing the particle after.

The wave communicates with the particle at the speed $V = c^2 / w$ that is the general formula for the speed of the forces.

$$c^2 t^2 - x^2 = k \quad \Leftrightarrow \quad x = \sqrt{c^2 t^2 - k}$$

$$V = \frac{dx}{dt} = \frac{c^2}{w}$$

For the electron: $V_e = c + 5.1 \times 10^{-5} ms^{-1}$

The interaction wave is composed of magnetic photons that are undetectable and are longitudinal waves. This speed is always greater then light speed.

Aberration of the forces

The forces, with finite speeds, have no aberration because the interaction happens at half distance of the particles and so the time delay exists but is equal to both particles.

If it exists aberration also the orbits of the electrons in the atoms should be instable, and that doesn't happens.

Gravity speed

$$V = \frac{c^2}{w} \quad \text{and} \quad Mw^2 = hf_M = \frac{hc}{\sqrt{k}}$$

$$h = 6.6\times10^{-34} \;;\quad c = 3\times10^{8} \;;\quad k = 1.9\times10^{-34} \;,\quad M = mass$$

$$V = \frac{c^2 . \sqrt[4]{k}}{\sqrt{hc}} \sqrt{M}$$

Sun gravity speed:

$$M = 2\times10^{30}\,kg \quad \Leftrightarrow \quad V_S = 1.1\times10^{36}\,ms^{-1}$$

Universe gravity speed:

$$M_U = 1.8\times10^{53} \quad \Leftrightarrow \quad V_U = 3.2\times10^{47}$$

Creation of Negative Mass

A mass is an electric dipole moment:

$$m = qd$$

So, if we charge a capacitor we generate a mass. When the dipole is neutral the mass is negative.

Using a supercapacitor: $C = 100Farad$; $V = 2.5Volt$

$$q = CV \quad \Leftrightarrow \quad m = CVd$$

The average distance d is: $d = 1\times10^{-9}\,m$

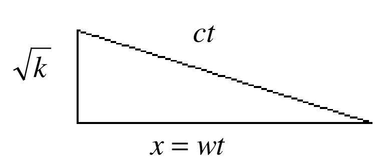
$$m = -0.25mg$$

So, a capacitor loses weight when charged.
This will be the future propulsion system.

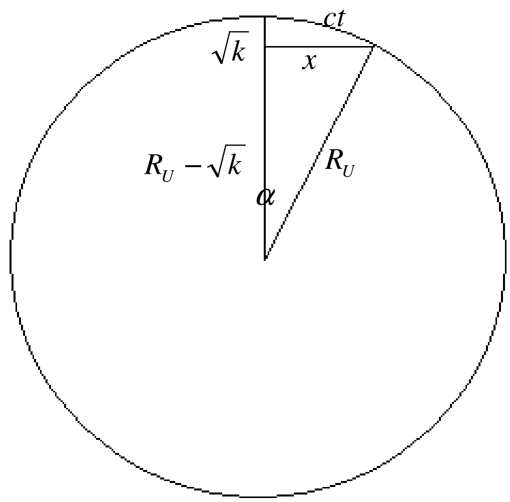
Broken Symmetry

$$c^2t^2 - x^2 = k \quad ;$$

h – Planck's constant



There are always two frames for light: ct is the path in our universe frame and x is the path in the local frame.



$R_U = 1.3\times10^{26} m$ -- Local radius of our universe

$$x^2 = R_U{}^2 - (R_U - \sqrt{k})^2 \quad \Leftrightarrow \quad x = 6.145\times10^4 m$$

$$\sin\alpha = \frac{x}{R_U} \quad \Leftrightarrow \quad \alpha = 4.727\times10^{-22} rad$$

$$t = 2.05\times10^{-4} s$$

Local curvature -- $\frac{1}{R_U} = 7.7\times10^{-27}$

Casimir and Unified Forces

Unified force from Absolute Relativity is similar to Casimir force.

Unified force:

$$F = \frac{khf^4}{w^3} \quad ; \quad w \approx c$$

$$f^4 \approx \frac{c^4}{x^4} \quad \Leftrightarrow \quad F = \frac{khc}{x^4}$$

Casimir force:

$$F = \frac{hc\pi A}{480.x^4}$$

Reference area:

$$A = \frac{480.k}{\pi} \quad ; \qquad k = \frac{h}{\pi}$$

$$A = \frac{480.h}{\pi^2} = 3.2\times10^{-32}\,m^2$$

Hydrogen Classical Wavelengths and Intensities

Wavelengths:

$$\frac{1}{\lambda} = R_H\left(\frac{1}{n_1{}^2} - \frac{1}{n_2{}^2}\right) \quad ; \qquad R_H = 1.09737316\times10^7$$

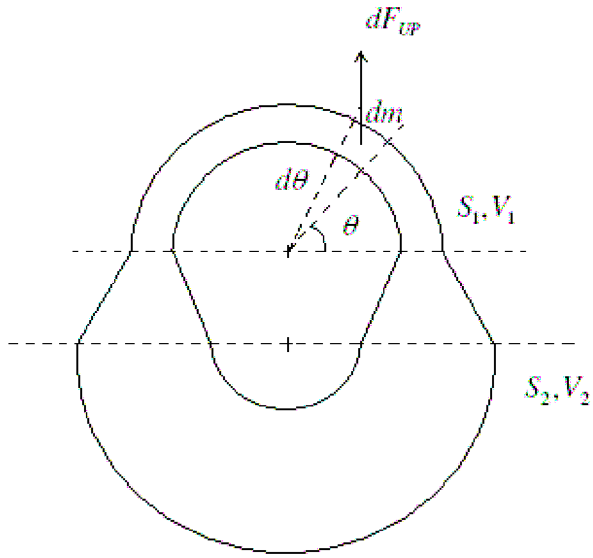
n_2	n_1	Relative intensity	Wavelength (nm)
9	2	5	383.5384
8	2	6	388.9049
7	2	8	397.0072
6	2	15	410.174
5	2	30	434.047
4	2	80	486.133
3	2	180	656.2852
7	4	5	2165.53

6	4	8	2625.15
5	4	15	4051.16
7	5	4	4652.51
6	5	6	7457.8
7	6	3	12368.5

According to Absolute Relativity:

Intensity -- $I = \lambda V^5 \quad \Leftrightarrow \quad I = \dfrac{2.55\times10^{11}.\lambda}{n_2^{\ 3.5}.n_1^{\ 3.6}}$

Force in a nozzle



A circular pipe forms a closed loop with two different sections and speeds. We will derive the formula of the force generated in the nozzles or expansion chambers, using the moment conservation principle. We assume a uniform flow and a constant speed.

Outflow formula: $S_1V_1 = S_2V_2$ and $S_2 / S_1 = n$

$$dF_{UP} = \frac{V_1^{\,2}}{R} sen\theta.dm \quad \text{and} \quad dm = \rho.S_1R.d\theta \quad \Leftrightarrow$$

$$\Leftrightarrow \quad F_{UP} = \rho.V_1^{\,2}S_1\int_0^{\pi} sen\theta.d\theta \quad \Leftrightarrow \quad F_{UP} = 2\rho.S_1V_1^{\,2}$$

The total vertical component of the up force is proportional to the mass per volume ρ, to the section of the pipe S_1 and to the squared speed of the liquid $V_1^{\,2}$. The same for the down force:

$$F_{DOWN} = 2\rho.S_2V_2^{\,2}$$

To agree with the principle of the linear moment conservation, the system can't generate movement. That means the total force must be equal to zero. So the force in the expansion chambers must be equal to:

$$\Leftrightarrow \qquad 2F_{EXP} = 2\rho.S_1V_1^2 - 2\rho.S_2V_2^2$$

Notice that the speed in both expansion chambers has opposite directions but in one we have acceleration and in the other a deceleration, so both forces have the same direction – down. Notice also that the friction force has no influence in the system but, to be sure we can suppose a system composed of two elements in counter-rotation. So:

$$F_{EXP} = \rho.S_1V_1^2\left(1-\frac{1}{n}\right)$$

For a real and open expansion chamber $n = \infty$, and the force in the chamber is independent of the geometry of it:

$$\underline{F = \rho.S_1V_1^2}$$

One Dimensional Maxwell Equations

$$\begin{cases} \dfrac{dE}{dx} = \dfrac{\rho_E}{\varepsilon} \\ \dfrac{dB}{dx} = \rho_M \\ \dfrac{dE}{dx} = -\dfrac{dB}{dt} - J_M \\ \dfrac{dB}{dx} = \dfrac{w^2}{c^4}\dfrac{dE}{dt} + \mu J_E \\ E = \dfrac{c^2}{w}B \end{cases}$$

$$w = \frac{x}{t} = \sqrt{c^2 - kf^2} \quad ; \qquad c^2t^2 - x^2 = k$$

For the electron: $B_0 = c^2$; $E_0 = c^3$

Magnetic field: $B = B_0 \sin\left(\frac{4\pi^2}{x^2}\left(c^2t^2 - x^2\right)\right)$

Electric field: $E = E_0 \sin\left(\frac{4\pi^2}{x^2}\left(c^2t^2 - x^2\right)\right)$

Magnetic potential or circulation: $A = A_0 \sin\left(\frac{4\pi^2}{x^2}\left(c^2t^2 - x^2\right)\right)$

Time Doesn't Exist

Time is a ratio of transformation:

$$t = \frac{\Delta Q}{V_Q}$$

Time is the ratio of the variation of any physical quantity with it speed of variation. So, time is not defined only with space, distance or length.

Time is very useful to compare different phenomena but it is only a mathematical entity. It doesn't exist as a thing or a coordinate. Time doesn't exist in nature.

The clocks don't measure time; they measure a variation of a physical quantity like position, mass volume or electric field, with their intrinsic velocity of transformation.

In relativity and quantum mechanics time doesn't flow as an external time. The intrinsic time is not a coordinate but a period. The wave packets don't spread.

We can make an absolute clock by measuring the variation of a magnetic field.

The speed varies with speed:

$$V = V_0(1 - v^2 / c^2)$$

Magnetic field also varies with speed the same way:

$$B = B_0(1 - v^2 / c^2)$$

Absolute clock:

$$t = \frac{\Delta B}{V_B} = \frac{\Delta B_0(1 - v^2 / c^2)}{V_{0B}(1 - v^2 / c^2)} = \frac{\Delta B_0}{V_{0B}}$$

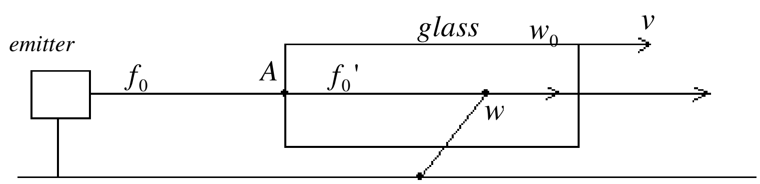
The relativity speed confusion

The relativistic physicians use the speed addition formula in wrong cases:

$$w = c^2 \frac{w_0 + v}{c^2 + vw_0}$$

If $w_0 = c$ ⇔ $w = c$ -- There's no addition

But this formula is true for only one case:



We have a peace of glass moving at speed v. The speed of the light with frequency f_0 is w_0. But when the light enters the glass at the point A it changes the frequency to f_0' with speed w_0'. This light is totally carried by the glass so the total speed is $w_0' + v = w$

$$w_0' = c^2 \frac{w_0 + v}{c^2 + vw_0} - v \quad \text{and} \quad f = \frac{cf_0\sqrt{c^2 - v^2}}{c^2 + vw_0}$$

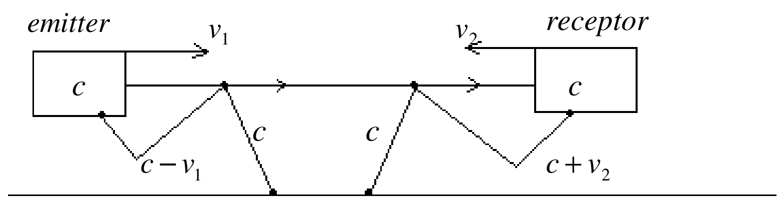
$$w_0' = w_0 \frac{f}{cf_0}\sqrt{c^2 - v^2} \quad \Leftrightarrow \quad c - v = \frac{f}{f_0}\sqrt{c^2 - v^2}$$

$$\Leftrightarrow \qquad f = f_0\sqrt{\frac{c-v}{c+v}}$$

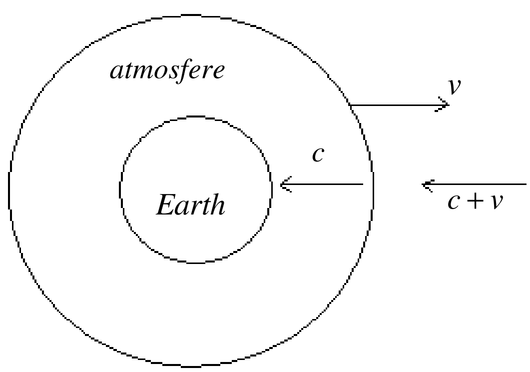
As we have said we found the formula of the variation of frequency when the light enters the glass.

There is another formula that the relativistic physicians deny:

$$w = c \pm v$$



Those are the relatives speeds of light.



At Earth we can't measure the relative speed of the light because it changes to c when enters the atmosphere.

Cold Fusion

The cold fusion has the same explanation as the superconductivity. The lattice behaves as a black hole for electrons, so their repulsion force becomes zero.

$$F = \frac{kh(c^2 - v^2)^2 f_0^{\,4}}{c^2(c^2 + vw_0)(w_0 + v)^3}$$

$$\frac{Gm}{x} = c^2 \qquad\qquad \frac{m}{x} = 3.45\times10^{-16}$$

D -- $m_1 = 3.34\times10^{-27}\,kg$; $x_1 = 1.64\times10^{-9}\,m$

Pd -- $m_2 = 1.77\times10^{-25}$; $x_2 = 2.62\times10^{-10}$

$$\begin{cases} \dfrac{1}{x} = \dfrac{1}{n+1}\left(\dfrac{1}{x_1} + \dfrac{n}{x_2}\right) \\ m = m_1 + nm_2 \\ \dfrac{m}{x} = 3.45\times10^{-16} \end{cases}$$

$n = 0.9$ -- $DPd_{0.9}$

$D/Pd = 1.1$ (number of atoms)

The palladium charged with deuterium must be superconductor.

Pioneer 10 Anomaly

The Pioneer 10 anomaly is a relativistic flyby anomaly. There’s no enough data from Pioneer 11.

$$\Delta\theta = \frac{3GM\varepsilon\sin\theta}{c^2 a(1-\varepsilon^2)}$$

Corrected orbital speed:

$$v = \sqrt{\frac{GM}{a(1-\varepsilon^2)}}\sqrt{3 - \varepsilon^2 + 2\varepsilon\cos\theta} \qquad \text{and} \qquad \theta = 90$$

$$v^2 = \frac{GM(3-\varepsilon^2)}{a(1-\varepsilon^2)}$$

Acceleration:

$$g = \frac{1}{2}\frac{d(v^2)}{da} = -\frac{GM(3-\varepsilon^2)}{2a^2(1-\varepsilon^2)}$$

Data from Pioneer 10:

$$a = 1.03\times 10^{12}\,m\,; \qquad \underline{\varepsilon = 1.73359601}$$

Pioneer acceleration:

$$g = 8.74\times 10^{-10}\,ms^{-2}$$

$$\frac{3-\varepsilon^2}{1-\varepsilon^2} = \frac{2ga^2}{GM} \quad \Leftrightarrow \quad \underline{\varepsilon = 1.73206}$$

Gravitational Field from a Rotating Magnet

Gravitomagnetism doesn't exist.

A rotating magnet produces a gravitational field that can be positive or negative:

$$g = \vec{B}\omega$$

g -- acceleration; B -- magnetic field; ω -- angular speed

For a superconductor:

$$\vec{B} = \frac{m_e}{q_e}\omega$$

m_e -- mass of the electron; q_e -- charge of the electron

$$g = \frac{m_e}{q_e}\omega^2$$

$$\omega = 1200 s^{-1} \quad \Leftrightarrow \quad g = 8.2 \times 10^{-6} ms^{-2}$$

Magnetic current

There are monopoles but they exist at the very interior of the sub atomic particles. At a macroscopic level a magnetic charge is a Cooper pair.

Cooper pairs have no electric charge and they are the unit of magnetic charge.

Magnetic charge:

$$q_M = \frac{h}{2q_e}$$

A magnetic voltage is equal to a electric current:

$$V_M = I_E$$

A magnetic current is equal to an electric voltage:

$$I_M = V_E$$

Magnetic resistance:

$$R_M = \frac{1}{R_E} = \frac{V_M}{I_M} = \frac{I_E}{V_E}$$

The magnetic resistance is equal to the magnetic potential:

$$R_M = A \qquad \text{and} \qquad A = Bx$$

For a superconductor:

$$R_E = 0 \quad \Leftrightarrow \quad R_M = \infty$$

$$A = \infty \quad \Leftrightarrow \quad x = \infty$$

$$F = \frac{khf^4}{w^3} = 0 \quad \Leftrightarrow \quad w = \infty$$

Units variation with speed

Distance $x = x_0 \sqrt{1 - v^2 / c^2}$

Time $t = t_0 / \sqrt{1 - v^2 / c^2}$

Speed $w = w_0 (1 - v^2 / c^2)$

Magnetic field $B = B_0 (1 - v^2 / c^2)$

Electric field $E = E_0 (1 - v^2 / c^2)^2$

Permittivity $\varepsilon = \varepsilon_0 \sqrt{1 - v^2 / c^2}$

Permeability $\mu = \mu_0 /(1 - v^2 / c^2)^{5/2}$

Energy $E = E_0 / \sqrt{1 - v^2 / c^2}$

Mass $m = m_0 /(1 - v^2 / c^2)^{3/2}$

Acceleration $a = a_0 (1 - v^2 / c^2)^{3/2}$

Force $F = F_0 (1 - v^2 / c^2)^2$

Spin $h = h_0 \sqrt{1 - v^2 / c^2}$

Electric charge $q = q_0 /(1 - v^2 / c^2)$

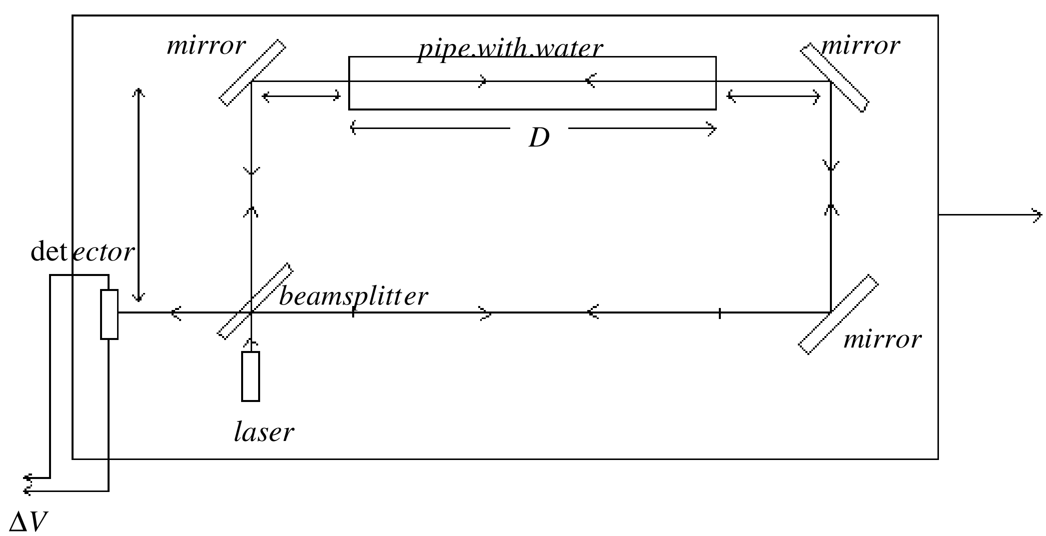
Magnetic charge $q_m = q_{m0} (1 - v^2 / c^2)$

Magnetic potential $A = A_0(1 - v^2 / c^2)^{3/2}$

Momentum $p = p_0 /(1 - v^2 / c^2)^{3/2}$

Linear Sagnac Experiment

This experiment is a version of the Sagnac experiment made with linear speed. So, the system is an inertial referential. It will prove if light speed has or not relative speed.



The device has a laser diode ($\lambda = 6.5 \times 10^{-7} m$, $P=$ 3.5mW), a 50% - 50% beam splitter, three mirrors, a pipe filled of water with two glass windows, another one with vacuum and a light detector .

The laser beam is divided on the splitter and travels in two directions in the mirrors circuit. Then they are joined again and went to the detector where the variable interference pattern generates the voltage ΔV .

The device moves in the exterior of a car so, the movement relative to the rest air will sum and subtract to light speed. According to relativity theory this is impossible.

Times of the light rays:

$$\begin{cases} t_1 = k + \dfrac{D}{w} + \dfrac{D}{c-v} \\ t_2 = k + \dfrac{D}{w} + \dfrac{D}{c+v} \end{cases} \quad \text{and} \quad t = t_1 - t_2$$

$$t = \frac{2Dv}{c^2} \quad ; \quad D = 0.33m \quad ; \quad t = 7.34 \times 10^{-18} v$$

Space phase shift:

$$\Delta t = 7.34 \times 10^{-18} \Delta v \quad \text{and} \quad \Delta x = c\Delta t \quad \Leftrightarrow \quad \Delta x = 2.2 \times 10^{-9} \Delta v$$

Voltage variation on the detector:

$$\Delta V = V \frac{\Delta x}{\lambda / 2} \quad \text{with} \quad \lambda = 6.5 \times 10^{-7} m \quad \Leftrightarrow$$

$$\Leftrightarrow \quad \Delta V = V \times 6.8 \times 10^{-3} \Delta v$$

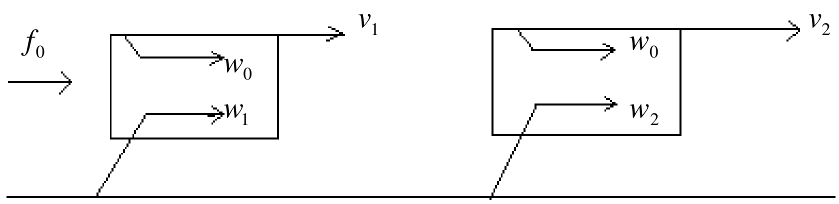
In our device $V = 60mV$, so for a $\Delta v = 100km/h = 27.8m/s$:

$$\underline{\Delta V = 11.3mV} \quad ; \quad \frac{\Delta V}{V} = 19\%$$

We have made the experiment (2008-06-02), made 20 measures and found always a voltage variation of 10 mV.

So, we have proved that light speed is not constant and that it sums to the speed of the receptor.

Relativity addition velocity is not a relative speed



$$v_2 - v_1 = c^2 \frac{(c^2 - w_0{}^2)(w_2 - w_1)}{(c^2 - w_2 w_0)(c^2 - w_1 w_0)}$$

$$w_1 = c^2 \frac{w_0 + v_1}{c^2 + v_1 w_0} \; ; \qquad v_R = w_0 - v_1$$

w_1 is not the relative speed between w_0 and v_1, so:

$$v_x = c^2 \frac{v_2 - v_1}{c^2 - v_1 v_2} \qquad \text{is not the relative speed}$$

The speed variation in a moving medium happens because of the frequency Doppler variation:

$$f_1 = f_0 \frac{c}{c + v_1} \qquad \text{and} \qquad f^2 = \frac{c^2 - w^2}{k} \qquad \Leftrightarrow$$

$$\Leftrightarrow \qquad w_1 = c \frac{w_0 + v_1}{c + v_1} \qquad \Leftrightarrow$$

$$\Leftrightarrow \qquad w_1 = c^2 \frac{w_0 + v_1}{c^2 + v_1 c}$$

Laboratory detection of gravitational waves

Any relative unit that changes with speed or gravity can be used to detect gravitational waves. We think that the easier one is electric voltage.

$$V = V_0 / \sqrt{1 - v^2 / c^2} \quad \Leftrightarrow$$

$$\Delta V = \frac{V_0 v}{c^2} \Delta v \qquad \text{and} \qquad v = \sqrt{\frac{2GM}{R}}$$

$$\Leftrightarrow \qquad \Delta v = \frac{-\sqrt{2GM}}{2R^{3/2}} \Delta R$$

$$\Leftrightarrow \qquad \Delta V = -\frac{V_0 GM}{c^2 R^2} \Delta R$$

Voltage variation with the distance variation of a mass.

For $\Delta R = 1m$; $V_0 = 1000V$; $M = 1kg$; $R = 0.001m$

$$\Delta V = 7.4 \times 10^{-19} V$$

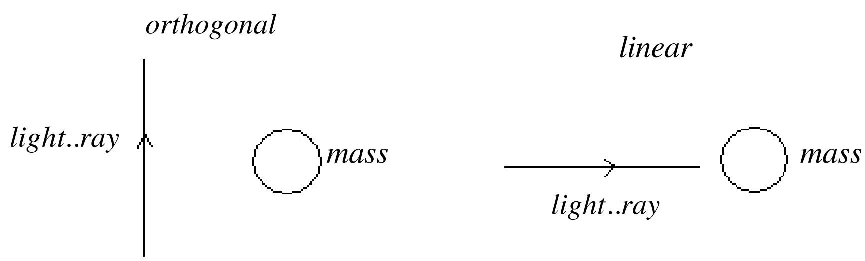
For $M = 2 \times 10^{30} kg$; $R = 1000Ly = 9.5 \times 10^{18} m$; $\Delta R = 1.5 \times 10^{11} m$

$$\Delta V = 2.5 \times 10^{-19} V$$

Why using galactic or extragalactic sources if we can reach the same accuracy in a laboratory?

Lab. Gravitational Wave Detection

There are two types of interaction of matter with light: the usual orthogonal interaction and the linear interaction.



Orthogonal formula for frequency:

$$f = f_0\sqrt{1 - v^2 / c^2}$$

Linear effect:

$$f = f_0\sqrt{\frac{c - v}{c + v}}$$

Orthogonal case:

$$\Delta f = -f_0 \frac{v}{c^2}\Delta v \quad ; \qquad v = \sqrt{\frac{2GM}{R}} \quad ; \qquad \Delta v = -\frac{1}{2}\frac{\sqrt{2GM}}{R^{3/2}}\Delta R$$

$$\Delta f = \frac{f_0}{c^2}\frac{GM}{R^2}\Delta R$$

For M=1, $\Delta R = 1$, R=1, $f_0 = 1\times 10^9$ $\Leftrightarrow$

$\Leftrightarrow$ $\Delta f = 7.42\times 10^{-19}\, Hz$

Linear case:

$$\Delta f = -\frac{f_0}{c}\Delta v \quad ; \qquad \Delta f = \frac{f_0}{2c\sqrt{2GM}\,R^{3/2}}\Delta R$$

$$\Delta f = 1.44\times 10^5\, Hz$$

It’s very easy to detect the linear gravitational effect in a lab.

Gravity speed measurement

Frequency variation with gravity:

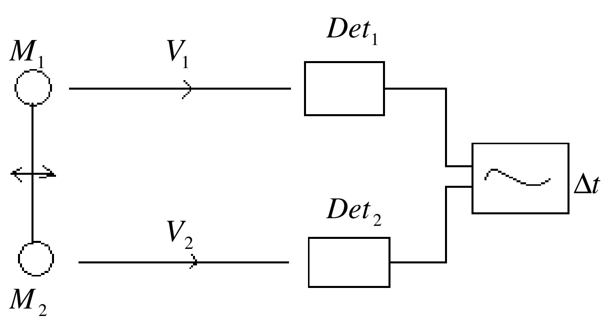
$$f = \frac{f_0}{\sqrt{1 - v^2 / c^2}} \qquad \text{and} \qquad v = \sqrt{\frac{2GM}{R}} \qquad \Leftrightarrow$$

$$\Leftrightarrow \qquad \Delta f = -\frac{f_0 GM}{c^2 R^2} \Delta R$$

$$f_0 = 1\times10^9 \, Hz ; \quad M = 1kg ; \quad \Delta R = 1m ; \quad R = 0.01m$$

$$\Delta f = 7.4\times10^{-15} \, Hz$$

It's possible to prove, in laboratory, that gravity speed is greater than light speed.
We use two different masses, oscillating together, and two detectors of gravitational waves. Then we detect the time difference between the two waves. According to Einstein's this value is zero.



$$V_1 = 9\times10^{20}\sqrt{M_1} \quad ; \quad V_2 = 9\times10^{20}\sqrt{M_2}$$

$$\Delta t = R\frac{\sqrt{M_2} - \sqrt{M_1}}{9\times10^{20}\sqrt{M_1}\sqrt{M_2}}$$

$$R = 1m ; \quad M_1 = 1mg ; \quad M_2 = 2mg ; \qquad \Leftrightarrow$$

$$\Leftrightarrow \qquad \Delta t = 3.3\times10^{-19} \, s$$

Sound and light speed limits

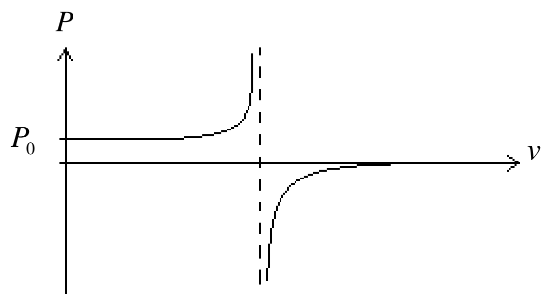
Mathematically it's impossible to overcome the sound and the light barrier.
The argument for the impossibility of overcome light speed is the same used for sound and we know that mach 2 is possible.

For sound, pressure Doppler formula:

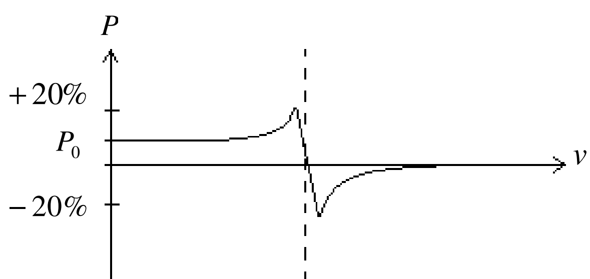
$$P = P_0 \frac{V}{V - v}$$

P – pressure; V – sound speed; P0 – normal pressure; v – airplane speed.

Mathematical graphic:



Real graphic:

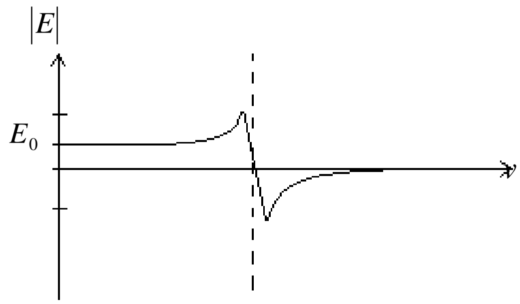


What happens for light must also happens for light.

Temperature: $$T^4 = T_0^4 \frac{c}{c - v}$$

Radiation pressure: $$P = P_0 \frac{c}{c - v}$$

Rest energy: $E = \dfrac{E_0}{\sqrt{1 - v^2 / c^2}}$



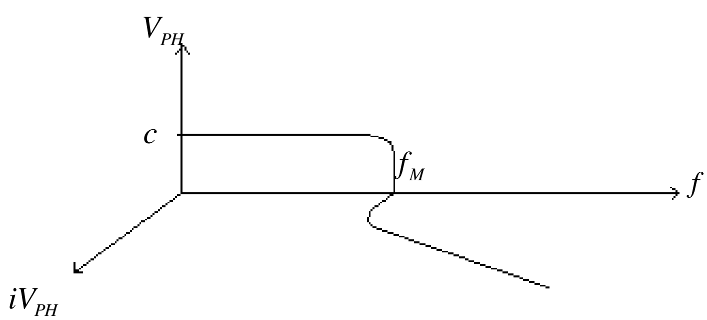
Overcome the light barrier is easier than overcome the sound one.

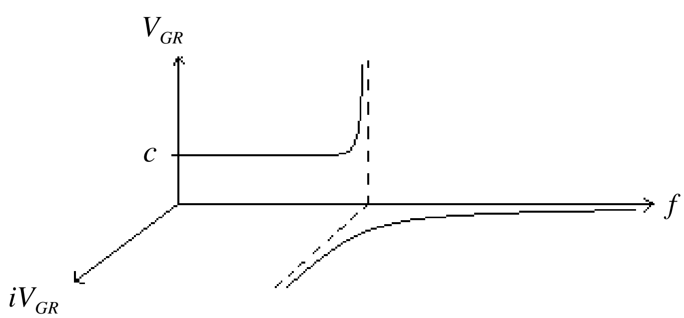
Group and phase speeds

$V_{PH} . V_{GR} = c^2$ and $V_{PH} = w = \sqrt{c^2 - kf^2} = \dfrac{x}{t}$

$V_{GR} = \dfrac{dx}{dt}$ and $c^2 t^2 - x^2 = k$

$$\frac{x}{t}\frac{dx}{dt} = c^2$$





The group speed or the true speed of transmission of information can be infinite.

Group speed of gravity

$$M.w^2 = h.f_M = \frac{h.c}{\sqrt{k}} \qquad \Leftrightarrow \qquad w = \sqrt{\frac{h.c}{\sqrt{k}M}}$$

$$V_{GR} = \frac{c^2}{w} \qquad \Leftrightarrow \qquad V_{GR} = c^2\sqrt{\frac{\sqrt{k}}{h.c}}\sqrt{M}$$

$$V_{GR} = 9\times10^{20}\sqrt{M}$$

M – mass of the body

The speed of the transmission of the gravity is variable with the mass of the body and it is faster than light speed.

Imaginary frequencies

There are also imaginary frequencies.

$$\begin{cases} x = c\dfrac{x_0 + vt_0}{\sqrt{c^2 - v^2}} \\ f = cf_0\dfrac{\sqrt{c^2 - v^2}}{c^2 + vw_0} \end{cases} \qquad \text{and} \qquad v \geq c$$

$$\begin{cases} x = -ic\dfrac{x_0 + vt_0}{\sqrt{v^2 - c^2}} \\ f = icf_0\dfrac{\sqrt{v^2 - c^2}}{c^2 + vw_0} \end{cases}$$

$$v \to \infty \qquad \Leftrightarrow \qquad \begin{cases} x = -ict_0 \\ f = ic / x_0 \end{cases}$$

Speed: $w = \sqrt{c^2 + kf^2}$

It's impossible to violate causality

If we found a phenomenon fast then light speed the causality is not violated because that phenomenon will define a new causality. Causality doesn't stay attached to light, but to the fastest phenomenon.

A spacecraft has no speed limit

At light speed the mass of the craft is infinite but the reaction mass is also infinite, so we have infinite energy. In the reference frame of the craft everything stays the same as classical physics predict.

Gravitational constant

$$G = \frac{cH_0 R_U{}^2}{M_U}$$

Hubble constant -- $H_0 = 2.3 \times 10^{-18} Hz$

Light speed – c

Mass of the universe -- $M_U = 1.76 \times 10^{53} kg$

Radius of the universe -- $R_U = 1.3 \times 10^{26} m$

Electron and neutrino

All the electrons are binding to a neutrino.

$\lambda = 137 x_e = 3.324 \times 10^{-10}$; $x_e =$ electron wavelength

$$m = \frac{h}{c\lambda} = 6.65 \times 10^{-33}$$

Average mass of the neutrino:

$$m_\nu = \frac{m^2}{m_e} = 4.85\times10^{-35}$$

Universe mass -- $M_U = 1.76\times10^{53}$

Observable mass -- $M_O = 2\times10^{52}$ (11%)

$$\Delta M = 1.56\times10^{53}$$

Number of neutrinos -- $n = 2.761\times10^{87}$

Average mass of the neutrino:

$$m_\nu = \frac{\Delta M}{n} = 5.65\times10^{-35}$$

Tau neutrino:

$$m_T = 3\times5\times10^{-35} = 1.5\times10^{-34}$$

How can the orbit of an electron be stable?

The interaction of an electron that orbits a proton propagates at light speed. Due to aberration the orbit must be unstable and we know that's not the case. Why?
Because the time delay is equal for both particles. The interaction happens at near half distance of the two particles, so both particles are delayed an equal amount. In this case the orbit is stable.

The same happens with gravity and all the forces. So, the no aberration of gravity doesn't prove that the speed of gravity is greater than light speed. We know that it has a greater speed but the no aberration is not a prove.

The Magnetic Moment Problem

Linear momentum of the electron in hydrogen:

$$p = m_e v = m_e \frac{c}{137} = 1.9935 \times 10^{-24} kg.m/s$$

True magnetic moment (units: Weber.meter):

$$M = q_m x_e = \frac{h}{2q_e} x_e = 5.02 \times 10^{-27} Wm$$

Usual magnetic moment or only linear momentum:

$$\mu = \frac{q_e c x_e}{4\pi} = 9.27 \times 10^{-24} Am^2 (= kg.m/s = N.s)$$

So, what are the physicians measuring?

h – Planck's constant

me – Mass of the electron

c – Light speed

qm – Unitary magnetic charge

qe – Unitary electric charge

xe – Wavelength of the electron

S.I. Units Unification II

Everything is made only of distance (L) and speed (V).

	L-1	L0	L	L2	L3	L4	L5
V-1	Thermal Resistance; Electric Resistance		Time; Inverse Frequency				
V0			Distance; Permittivity	Surface; Capacitance; Boltzmann Constant	Volume; Inverse Gravitational Constant		
V	Frequency; Vorticity	Speed; Magnetic Field	Magnetic Potential; Conductance; Circulation	Magnetic Charge; Magnetic Flux	True Magnetic Dipole Moment		
V2	Acceleration; Current Density	Electric Field; Inverse Inductance	Magnetic Current; Electric Voltage; Inverse Permeability	Electric Flux; Q.M. Probability	Electric Charge	Mass; Electric Dipole Moment	
V3	Sound Resistance	Electric Current Density; Potential Vorticity	Magnetic Field Strength	Magnetic Voltage; Electric Current		Momentum; False Magnetic Moment	Planck Constant; Angular Momentum
V4			Pressure; Energy Density	Temperature; Surface Tension	Force	Energy; Torque	
V5	Luminance	Spectral Irradiance	Intensity; Irradiance		Power		

Heat capacity = L^2

Specific heat capacity = $L^{-2}V^{-2}$

Volumetric heat capacity = L^{-1}

Heat = Energy

$V^2 L = \frac{1}{\mu_0} = Gm$; G – Gravitational constant; m – Mass

Magnetic Voltage = Magnetomotive Force = Electric current

Entropy = L^2

Kinematic viscosity = Magnetic potential

Electric resistance = Inverse magnetic potential

Magnetic resistance = Magnetic potential

Density = Sound impedance = Inverse permeability = Electric displacement field

Dynamic viscosity = Electric current

Temperature = Energy surface density

Magnetic charge = Outflow

Vacuum energy = $\left(\frac{\varepsilon_0}{\mu_0}\right)^2$

Magnetic resistance = inverse electric resistance

Jerk = $L^{-2}V^3$

Quantum mechanics wavefunction = magnetic potential

Distance = permittivity

Speed = Magnetic field

Superconductivity

The Cooper-pairs are formed due to an attractive force between electrons when the medium behaves as a black hole.

Unified force between two electrons:

$$F = \frac{kh(c^2 - v^2)^2 f_0^{\ 4}}{c^2(c^2 - vw_0)(w_0 - v)^3}$$

$$v = \sqrt{\frac{2Gm}{R}}$$ -- Escape speed of the medium

For F<0 – attractive force ⇔

$$v > \frac{c^2}{c - \Delta w_0} = c + \Delta w_0 \quad \text{or} \quad v > c - \Delta w_0$$

Not and ; $v \neq c$ ⇔ $v \in \left]c - \Delta w_0, c + \Delta w_0\right[$

$$\Delta w_0 = \frac{kf_e^{\,2}}{2c} = 4.78 \times 10^{-3}$$

For $v = c + \frac{\Delta w_0}{2}$ ⇔ $F = \frac{16khf_e^{\,4}}{27c\Delta w_0^{\,2}}$

Binding energy:

$$E = \frac{16khf_e^{\,4}L}{27c\Delta w_0^{\,2}} = 1.6 \times 10^{-22}\,J \quad \Leftrightarrow$$

$$\Leftrightarrow \quad E = \frac{3.65 \times 10^{-27}}{4(v-c)^2}$$

Critical temperature:

$$T_C = \frac{E}{d^2} \quad \Leftrightarrow \quad T_C = \frac{1.7 \times 10^{-4}}{(v-c)^2}$$

$$T_C = \frac{1.7 \times 10^{-4}}{\left(\sqrt{\frac{2Gm}{R}} - c\right)^2} \quad \text{and} \quad \frac{2Gm}{R} \approx c^2$$

$$\Leftrightarrow \quad T_C = \frac{1.7 \times 10^{-4}}{\left(\sqrt{1.4 \times 10^{32}\frac{m}{R}} - c\right)^2}$$

The critical temperature is variable with the atomic mass and atomic radius of the medium.

Table of the atomic mass/atomic radius/N of the elements

N= 1	Sc 4.6 -16	Ti 5.4 -16	V 6.3 -16	Cr 6.7 -16					Cu 8.2 -16	Zn 8.0 -16	Ga 7.6 -16	Ge 9.9 -16	
2	Y 4.1 -16	Zr 4.7 -16				Ru 6.3 -16	Rh 6.4 -16		Ag 6.2 -16	Cd 6.2 -16		Sn 6.3 -16	Sb 7.2 -16
3	Lu 5.6 -16	Hf 6.2 -16					Ir 7.8 -16	Pt 7.8 -16	Au 7.6 -16	Hg 7.2 -16		Pb 6.6 -16	Bi 6.4 -16

Fundamental orbit of the electron

Abstract – The fine structure constant $\approx \frac{1}{137}$ is not well understood.

In this article we show the real meaning of the number 137 (the perimeter of the orbit of the electron is 137 times the Compton wavelength of the electron) and we justify why is this number and not another.

According to classical physics the speed of the electron in his orbit is:

$$v = \frac{c}{137} \; ; \qquad \text{c – light speed}$$

The perimeter of the orbit:

$$2.\pi.R_B = 137.x_e \; ; \qquad x_e = 2.426 \times 10^{-12} m$$

R_B -- Bohr's radius ; x_e -- Compton wavelength of the electron

The meaning of the number 137 is very simple: for this number the total energy of the electron (sum of the potential energy and kinetic energy) is minimum:

Potential energy:

$$E_P = m_e g R_B \qquad \text{e} \qquad g = \frac{q_e^{\ 2}}{4\pi\varepsilon_0 R_B^{\ 2} m_e}$$

m_e -- electron mass; g – acceleration; q_e -- electron charge; ε_0 -- vacuum permittivity.

$$\Leftrightarrow \qquad E_P = \frac{q_e^{\ 2}}{2.\varepsilon_0 137.x_e}$$

Kinetic energy:

$$E_K = \frac{1}{2} m_e \frac{c^2}{137^2}$$

Total energy function of the number of wavelengths (it's possible to demonstrate that the potential energy is allays negative):

$$E = \frac{m_e c^2}{2n^2} - \frac{q_e^{\ 2}}{2\varepsilon_0 x_e n}$$

For a energy minimum $\Leftrightarrow$

$$\Leftrightarrow \qquad \frac{dE}{dn} = 0 \qquad \Leftrightarrow$$

$$\frac{dE}{dn} = \frac{q_e^{\ 2}}{2\varepsilon_0 x_e n^2} - \frac{m_e c^2}{n^3} = 0 \qquad \Leftrightarrow$$

$$\Leftrightarrow \qquad n = \frac{2 m_e c^2 \varepsilon_0 x_e}{q_e^{\ 2}}$$

$$\Leftrightarrow \qquad n = 137.038$$

For a stable orbit the number must be an integer.

The particles have no intrinsic oscillation

The oscillation of the wave-particles it's not intrinsic but is due to his movement.

The formula of the electric field:

$$E = E_0 \sin\left(\frac{4\pi^2}{x^2}\left(c^2t^2 - x^2\right)\right) \qquad \text{and} \qquad c^2t^2 - x^2 = k$$

Is wrong for them.

The true formula is:

$$E = E_0 \frac{4\pi^2 k}{x^2} \qquad \text{and} \qquad E_0 = c^3 m^2 s^{-2}$$

Also for small values of x.

The energy of a particle has electromagnetic origin and is due only to one field, the magnetic or the electric not the sum of the two.

Mass:

$$m = \frac{h\sqrt{k + x^2}}{cx^2} = \frac{8\pi^4 \varepsilon_0 c^4 k^2 \sqrt{k + x^2}}{x^2} \qquad \Leftrightarrow$$

$$\Leftrightarrow \qquad 8\pi^4 \varepsilon_0 c^5 k^2 = h$$

Mass of the electron:

$$m_e = \frac{8\pi^4 c^2 k^2}{\mu_0 x_e}$$

Energy of the Universe

The total energy of the universe is equal to zero, because the potential energy is always negative and equal to the kinetic energy.

For the universe:

$$M_U c^2 = M_U g_U R_U \quad \text{and} \quad g_U = \frac{GM_U}{R_U^{\ 2}}$$

$$\Leftrightarrow \qquad \frac{GM_U}{R_U} = c^2$$

The universe is rotating locally at light speed.

Mu – mass of the universe

Ru – radius of the universe

c – light speed

gu – gravitational acceleration of the universe

For the earth:

$$E_P = \frac{M_T M_S G}{D_{TS}} \quad \text{and} \quad E_K = M_T V_O^{\ 2}$$

$$\Leftrightarrow \qquad V_O = \sqrt{\frac{GM_S}{D_{TS}}}$$

Mt – earth mass; Ms – sun mass; G – gravitational constant

Dts – distance earth sun; Vo – orbital speed

A Neutral Rotating Mass Generates a Magnetic Field

How is possible that a neutral particle has a magnetic moment?

Magnetic moment or only momentum:

$$p = mv = IA$$

m – mass; v – speed; I – electric current; A – area

$$I = \frac{mv}{\pi R^2}$$

Magnetic field of a current loop:

$$B = \frac{\mu_0 I}{2R} \qquad \Leftrightarrow$$

$$\Leftrightarrow \qquad B = \frac{\mu_0 mv}{2\pi R^3}$$

For the electron:

$$B = \frac{4\pi^2 \mu_0 c m_e}{137^4 {x_e}^3} = 2.7T$$

For macroscopic bodies:

$$B = \frac{\mu_0 M}{TR^2}$$; M – mass; T – period of rotation; R – radius

For Mercury, Earth and Jupiter:

$$B = 2.5 \times 10^{-5} \frac{\mu_0 M}{TR^2}$$

For Uranus, Neptune and Sun:

$$B = 4.6 \times 10^{-4} \frac{\mu_0 M}{TR^2}$$

Cold Fusion and Superconductivity

The two phenomena have the same explanation. The medium behaves as a black hole so the force between equal particles became attractive.

Unified force:

$$F = \frac{kh(c^2 - v^2)^2 f_0^{\ 4}}{c^2 (c^2 + vw_0)(w_0 + v)^3}$$

Escape speed:

$$v = -c = -\sqrt{\frac{2Gm}{x}}$$

The palladium charged with deuterium must be a superconductor.

Gravitational constant of the electron:

$$\frac{q_e^{\ 2}}{4\pi\varepsilon_0 R^2} = \frac{G_e m_e^{\ 2}}{R^2}$$

$$G_e = \frac{q_e^{\ 2}}{4\pi\varepsilon_0 m_e^{\ 2}} = 2.78 \times 10^{32}$$

Mass and lattice distance of the medium:

$$\frac{m}{x} = \frac{c^2}{2G_e} = 1.62 \times 10^{-16}$$

For Zn: $\frac{m}{x} = 8.0 \times 10^{-16}$

GPS and Relativity

The GPS doesn't need relativistic corrections because the satellites are constantly synchronized by earth stations. But relativistic corrections exist and have different values than usually claimed.

Orbital speed shift:

$$v_O = \sqrt{\frac{GM}{R_O}} = 3.9 \times 10^3 \, ms^{-1}$$

$$M = 6 \times 10^{24} \, kg \; ; \quad R_O = 2.66 \times 10^7 \, m$$

$$t = \frac{t_0}{\sqrt{1 - v^2 / c^2}} \quad \Leftrightarrow \quad \Delta t = t_0 \frac{v}{c^2} \Delta v \;\; ; \quad \Delta v \approx v$$

Time shift per day:

$$\Delta t = 24 \times 3600 \frac{v^2}{c^2} = 14.6 \mu s$$

Gravitational shift:

$$v_1 = \sqrt{\frac{2GM}{R_T}} = 1.12 \times 10^4 \;\; ; \quad R_T = 6.4 \times 10^6 \, m$$

$$v_2 = \sqrt{\frac{2GM}{R_O}} = 5.84 \times 10^3$$

$$\Delta v = v_1 - v_2 = 5.7 \times 10^3 \;\; ; \quad v \approx \Delta v$$

$$\Delta t = 24 \times 3600 \frac{v^2}{c^2} = 31.4 \mu s$$

Total shift per day:

$$\Delta T = 31.4 - 14.6 = 16.8\mu s$$

Force between a magnet and a superconductor

For a short distance the force is repulsive (+). For a long distance the force is attractive (-).

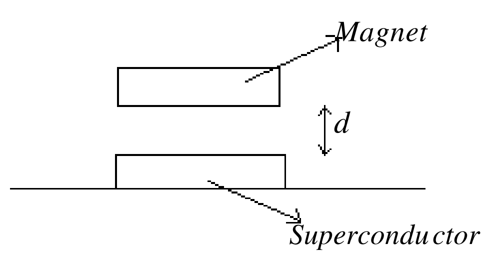
Force and orbital speed:

$$F = \frac{kh(c^2 - v^2)^2 f_0^{\ 4}}{c^2(c^2 + vw_0)(w_0 + v)^3} \qquad \text{and} \qquad v = \sqrt{\frac{G_e m}{d}}$$

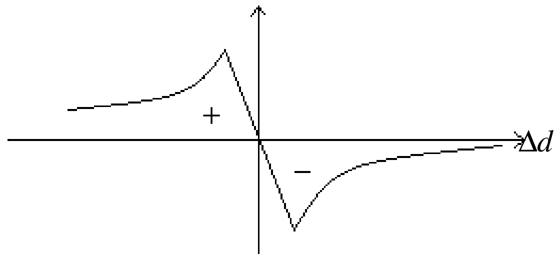
$$v = c - \Delta v\ ; \quad w_0 = c - \Delta w_0\ ; \quad \Delta v = \frac{1}{2}\sqrt{\frac{G_e m}{d^3}}\Delta d \qquad \Leftrightarrow$$

$$\Leftrightarrow \qquad F = \frac{4kh\Delta v^2 f_0^{\ 4}}{c(\Delta w_0 + \Delta v)(\Delta v - \Delta w_0)^3}$$

For $F = \infty = 0 \qquad \Leftrightarrow \qquad \frac{1}{2}\sqrt{\frac{G_e m}{d^3}}\Delta d_0 = \Delta w_0$



F



Absurdity

From the Einstein's and Planck's formulas of the energy:

$$E = mc^2 \qquad \text{and} \qquad E = hf \qquad \Leftrightarrow$$

$$\Leftrightarrow \qquad m = \frac{hf}{c^2}$$

For a visible photon:

$$f = 5 \times 10^{14}\,Hz \qquad \Leftrightarrow \qquad m = 3.686 \times 10^{-36}\,kg$$

Momentum:

$$p = mv$$

How can the photon has momentum if it has zero mass?

How can the photons feel gravity?

The Unified Absolute Relativity Theory explains this:

The photon has mass because his speed is not c but w.

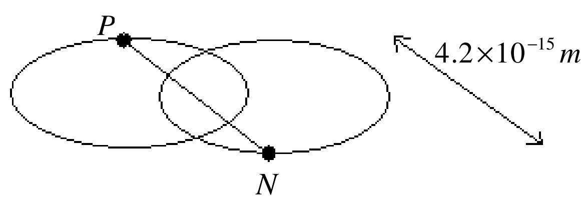
$$w = \sqrt{c^2 - kf^2} \qquad \Leftrightarrow \qquad c - w = \frac{kf^2}{2c}$$

For the same photon:

$$c - w = 8.3\times10^{-14} ms^{-1}$$

The Deuteron

Orbit of the proton and the neutron:



Mass and frequency of the center of mass:

$$m_D = 3.34\times10^{-27}; \qquad f = \frac{-h + \sqrt{h^2 + 4km_D{}^2c^2}}{2m_D k} = 4.53\times10^{23}$$

Acceleration:

$$g = \frac{kf^3}{w} = 6.2\times10^{28} \; ; \qquad g = \frac{2.\pi.c^2}{n^3 x_p} \; ; \qquad n = 19 \approx 20$$

Kinetic energy of the proton:

$$E_k = 1.1MeV = \frac{1}{2} m_p v^2 \qquad \Leftrightarrow \qquad v = 1.45\times10^7 \approx 1.5\times10^7$$

$$n = \frac{c}{v} = 20 \; ; \qquad R = \frac{20.x_p}{2.\pi} = 4.2\times10^{-15}$$

$x_p = 1.32\times10^{-15}$ -- Wavelength of the proton

n -- Number of wavelengths in the perimeter of the orbit

We can verify the values by the formula:

$$m_p vR = \frac{h}{2.\pi}$$

For He^3:

$$2.6MeV = \frac{1}{2} m_p v^2 \quad \Leftrightarrow \quad v = 2.23\times10^7$$

$$n = \frac{c}{v} = 13$$

$$3\times m_p = 5\times10^{-27} \; ; \qquad f = 6.82\times10^{23}$$

$$g = 2.1\times10^{29} \; ; \qquad n = 13$$

$$R = 2.73\times10^{-15}$$

For He^4:

$$7MeV = \frac{1}{2} mv^2 \quad \Leftrightarrow \quad v = 3.66\times10^7 \; ; \qquad n = 8$$

$$4m = 6.7\times10^{-27} \; ; \qquad f = 9.1\times10^{23} \; ; \qquad g = 4.94\times10^{29}$$

$$n = 9 \approx 8 \; ; \qquad R = 1.7\times10^{-15}$$

Electron gravitational constant

$$G = \frac{q^2}{4.\pi.\varepsilon_0 m^2} = 2.78\times10^{32}$$

$$v = \sqrt{\frac{Gm}{R_B}} = \frac{c}{137} \; ; \qquad R_B = \frac{137x}{2\pi}$$

$$w_0 = c^2 \frac{w - v}{c^2 - vw} \;\; ; \quad w = c - \Delta w \;\; ; \quad w_0 = c - \Delta w_0$$

$$\Leftrightarrow \qquad \Delta w_0 = \Delta w$$

Electron magnetic moment

Theoretical value: $\mu_T = 9.273 \times 10^{-24}$

Experimental value: $\mu = 9.284764 \times 10^{-24}$

$$\mu = \frac{\mu_T}{\sqrt{1 - v^2 / c^2}}$$

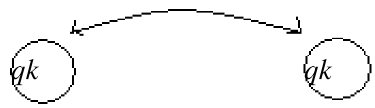
$$v = 1.5 \times 10^7$$

This is the orbital speed of the proton in deuteron.

Weak Force

The weak force is that between quarks, mediated by the bosons W and Z. The weak force is the strongest one.

$$W, Z$$



The quarks u and d are monopoles:

Magnetic and unified forces

$$F = \frac{q_m^{\ 2}}{4.\pi.\mu_0 x^2} = \frac{khf^4}{w^3} \ ; \qquad q_m = \frac{h}{2q_e}$$

q_m -- magnetic charge; q_e -- electric charge

$$x = 1.24\times10^{-17} \ ; \qquad f = 1.275\times10^{25}$$

$$w = 1.58\times10^{8} \ ; \qquad m = 3.36\times10^{-25} \ ; \qquad E = 99.8GeV$$

Weak force:

$$F = 2.8\times10^{12} N \ ; \qquad g = 2.61\times10^{33}$$

$$g = \frac{2.\pi.c^2}{n^3 x} \qquad \Leftrightarrow \qquad n = 3$$

$$v = \frac{c}{n} = 1\times10^{8} \ ; \qquad R = \frac{3x}{2\pi} = 5.93\times10^{-18}$$

Binding energy of two quarks:

$$E_B = FR = 104TeV$$

The electron has magnetic charges

Magnetic moment = μ

$$\mu_{\text{int}\,rinsic} = \mu_{orbital} = 9.28\times10^{-24}$$

$$\mu = \frac{qvR}{2}$$

Orbital: $R = 5.3 \times 10^{-11}$; $v = 2.2 \times 10^{6}$

Intrinsic: $R \approx 1 \times 10^{-18}$

$$v = \frac{2\mu}{qR} = 1.2 \times 10^{14}$$

The electron to has his intrinsic magnetic moment must rotate at this speed. If it is impossible there is only one explanation: the electron must has two magnetic charges.

$$q_e = \frac{h}{2q_m}$$

The Newton's force formula is valid in the microworld

$F = G\frac{m_1 m_2}{R^2}$; G – Variable gravitational constant

Force between two electrons

$F = \frac{khf^4}{w^3} = 1 \times 10^{-12} N$; $f = 1.2 \times 10^{20} Hz$; $w = c$

$F = G_e \frac{m_e^{\ 2}}{R_e^{\ 2}}$; $G_e = \frac{q^2}{4\pi\varepsilon_0 m_e^{\ 2}} = 2.78 \times 10^{32}$

Rydberg constant -- R_H

$\lambda_H = \frac{1}{R_H}$; $R_e = \frac{\lambda_H}{2\pi}$; $\lambda_H = 2x_e 137^2$

$$F = 1 \times 10^{-12} N$$

Force between two protons

$$F = \frac{khf^4}{w^3} = 13.0N$$

$$F = G_p \frac{m_p^{\ 2}}{R_p^{\ 2}} = 13.0N \;;\quad G_p = \frac{q^2}{4\pi\varepsilon_0 m_p^{\ 2}} = 8.2\times10^{25} \;;\quad R_p = 4.2\times10^{-15}m$$

Force between a proton and an electron

$$F = 8.2\times10^{-8}N$$

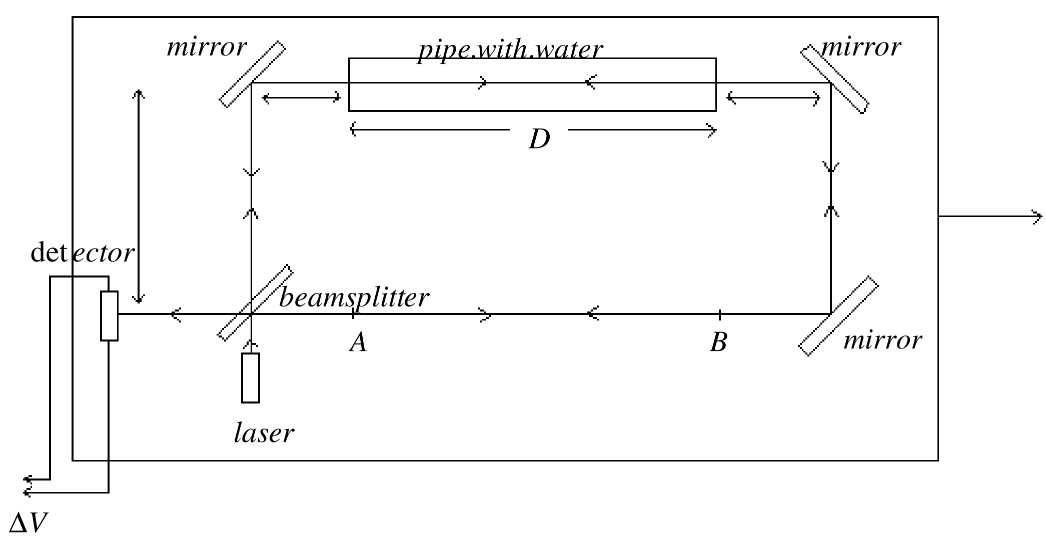
$$F = G_{pe}\frac{m_e m_p}{R_{pe}^{\ 2}} \;;\quad G_{pe} = \sqrt{G_p G_e}$$

$$G_e = 2.78\times10^{32} \;;\quad G_p = 8.24\times10^{25}$$

$$R_{pe} = R_B = Bohr's..radius$$

Linear Sagnac Experiment – II

This experiment is a version of the Sagnac experiment made with linear speed. So, the system is an inertial referential. It will prove if light speed has or not relative speed.



The device has a laser diode ($\lambda = 6.5\times10^{-7}\,m$, $P = 3.5mW$), a 50% - 50% beam splitter, three mirrors, a pipe filled of water with two glass windows and a light detector .

The laser beam is divided on the splitter and travels in two directions in the mirrors circuit. Then they are joined again and went to the detector where the variable interference pattern generates the voltage ΔV .

The device moves in the exterior of a car so, the movement relative to the rest air will sum and subtract to light speed. According to relativity theory this is impossible. It's important to note that the medium, the air, is at rest what is moving is the effective detector and the emitter that there are the points A and B.

Times of the light rays:

$$\begin{cases} t_1 = k + \dfrac{D}{w} + \dfrac{D}{c-v} \\ t_2 = k + \dfrac{D}{w} + \dfrac{D}{c+v} \end{cases} \qquad \text{and} \qquad t = t_1 - t_2$$

$$t = \frac{2Dv}{c^2} \quad ; \quad D = 0.33m \quad ; \quad t = 7.34\times10^{-18}\,v$$

Space phase shift:

$$\Delta t = 7.34\times10^{-18}\,\Delta v \quad \text{and} \quad \Delta x = c\Delta t \quad \Leftrightarrow \quad \Delta x = 2.2\times10^{-9}\,\Delta v$$

Voltage variation on the detector:

$$\Delta V = V\,\frac{\Delta x}{\lambda/2} \quad \text{with} \quad \lambda = 6.5\times10^{-7}\,m \quad \Leftrightarrow$$

$$\Leftrightarrow \quad \Delta V = V\times6.8\times10^{-3}\,\Delta v$$

In our device $V = 60mV$, so for a $\Delta v = 100km/h = 27.8m/s$:

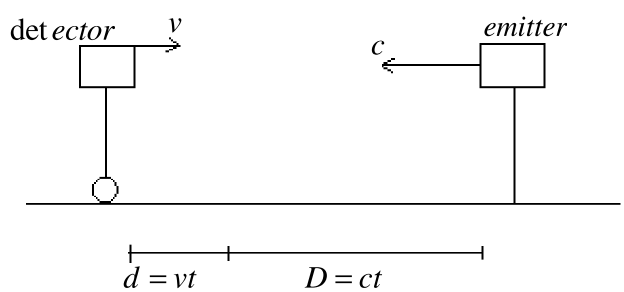
$$\underline{\Delta V = 11.3mV} \quad ; \quad \frac{\Delta V}{V} = 19\%$$

We have made the experiment (2008-06-02), made 20 measures and found always a voltage variation of 10 mV.

So, we have proved that light speed is not constant and that it sums to the speed of the receptor.

Further explanations

The points A and B work as emitter-detector and detector-emitter. We can see how light speed is additive in this experiment:



$$d + D = (c + v)t$$

This experiment is very different from the Fizeau experiment where what is moving is the medium. For instance we can not do the experiment with the device at rest and the air moving with a fan. In this case the formula we must use is:

$$w = c^2 \frac{w_0 + v}{c^2 + vw_0} \approx c$$

And the speed variation is very little.

Room-Temperature Superconductor

Condition for the existence of a superconductor:

$$c = \sqrt{\frac{Gm}{R}}$$

The orbital speed of the particles must be equal to light speed.

$$\frac{m}{R} = \frac{c^2}{G_e} \quad ; \qquad G_e = \frac{q_e^{\ 2}}{4\pi\varepsilon_0 m_e^{\ 2}} = 2.78\times10^{32}$$

G_e -- Gravitational constant of the electron

$$A = \frac{m}{R} = 3.23\times10^{-16}$$

Superconductor composite substance:

$$m = m_1 + n.m_2$$

$$R = \frac{R_1 + R_{nm}}{2} \quad ; \qquad V_{nm} = nV_m$$

$$R_{nm} = \sqrt[3]{n}R_2$$

$$R = \frac{R_1 + \sqrt[3]{n}R_2}{2} \qquad \Leftrightarrow \qquad 2\frac{m_1 + n.m_2}{R_1 + \sqrt[3]{n}R_2} = A$$

$$x = 2m_1 - AR_1 \ ; \qquad y = 6m^2x^2 - A^3R_2^{\ 3}$$

$$8n^3m_2^{\ 3} + 12n^2m_2^{\ 2}x + ny + x^3 = 0$$

$$AR_1 > 2m_1$$

One Room-temperature Superconductor

O -- $m_1 = 2.66 \times 10^{-26} kg$; $R_1 = 2.24 \times 10^{-10} m$

Zn -- $m_2 = 1.1 \times 10^{-25}$; $R_2 = 2.4 \times 10^{-10}$

⇔ n = 0.326

$OZn_{0.326}$ or ZnO_3

The zinc oxide doped with two more oxygen atoms is a room-temperature superconductor.

The palladium charged with deuterium is not a superconductor.

Other examples:

ZnF

$CuO_{3.2}$

Table of m and R of the elements

H 1.67 -27 1.99																	He 6.64 -27 2.59
Li 1.15 -26 2.16	Be 1.50 -26 1.56											B 1.79 -26 1.52	C 1.99 -26 1.60	N 2.33 -26 2.05	O 2.66 -26 2.24	F 3.15 -26 2.17	Ne 3.35 -26 2.38
Na 3.81 -26 2.93	Mg 4.04 -26 2.45											Al 4.48 -26 2.21	Si 4.66 -26 2.36	P 5.14 -26 2.63	S 5.32 -26 2.57	Cl 5.88 -26 2.93	Ar 6.63 -26 3.15
K 6.49 -26 4.12	Ca 6.65 -26 3.42	Sc 7.46 -26 2.86	Ti 7.95 -26 2.56	V 8.46 -26 2.35	Cr 8.63 -26 2.26	Mn 9.12 -26 2.29	Fe 9.27 -26 2.30	Co 9.78 -26 2.20	Ni 9.74 -26 2.14	Cu 1.05 -25 2.20	Zn 1.09 -25 2.38	Ga 1.16 -25 2.61	Ge 1.21 -25 2.73	As 1.24 -25 2.68	Se 1.31 -25 2.92	Br 1.33 -25 3.40	Kr 1.39 -25 3.67
Rb 1.42 -25 4.94	Sr 1.45 -25 4.19	Y 1.48 -25 3.52	Zr 1.51 -25 3.14	Nb 1.54 -25 2.90	Mo 1.59 -25 2.75	Tc 1.64 -25 2.66	Ru 1.68 -25 2.66	Rh 1.71 -25 2.65	Pd 1.77 -25 2.62	Ag 1.79 -25 2.77	Cd 1.87 -25 3.00	In 1.91 -25 3.20	Sn 1.97 -25 3.24	Sb 2.02 -25 3.37	Te 2.12 -25 3.50	I 2.11 -25 3.80	Xe 2.18 -25 4.53
Cs 2.21 -25 5.92	Ba 2.28 -25 4.89	Lu 2.91 -25 4.42	Hf 2.96 -25 3.46	Ta 3.00 -25 3.23	W 3.05 -25 3.06	Re 3.09 -25 3.02	Os 3.16 -25 2.98	Ir 3.19 -25 3.01	Pt 3.24 -25 2.95	Au 3.27 -25 3.07	Hg 3.33 -25 3.46	Tl 3.39 -25 3.66	Pb 3.44 -25 3.74	Bi 3.47 -25 3.96	Po 3.47 -25 4.06	At	Rn

Example: Hydrogen $m = 1.67 \times 10^{-27}$; $R = 1.99 \times 10^{-10}$

Calculation of *R*:

Density $$\rho = \frac{m}{\frac{4}{3}\pi R^3} \quad \Leftrightarrow \quad R = \sqrt[3]{\frac{3m}{4\pi\rho}}$$

Gravitational acceleration and mass composition (A correction to Newton's theory)

Wrong composition of the acceleration:

$$g = g_2 + g_1 = \frac{Gm_2}{R^2} + \frac{Gm_1}{R^2} \quad \text{and} \quad m_2 = n.m_1$$

$$\Leftrightarrow \qquad g = \frac{Gm_1}{R^2}(n+1) = g_1(n+1)$$

Force:

$$F = g_1 m_2 = gm \qquad \Leftrightarrow \qquad m = \frac{g_1 m_2}{g}$$

$$\Leftrightarrow \qquad m = \frac{n.m_1}{n+1} \qquad \text{and} \qquad n = \frac{m_2}{m_1}$$

$$\Leftrightarrow \qquad m = \frac{m_1 m_2}{m_2 - m_1} \qquad \text{or} \qquad \frac{1}{m} = \frac{1}{m_1} + \frac{1}{m_2}$$

This is the wrong reduced mass. It works fine but is wrong.

True acceleration composition:

$$g = \sqrt{g_1 g_2} = g_1 \sqrt{n}$$

True mass composition:

$$m = \sqrt{m_1 m_2} = m_1 \sqrt{n} = \frac{m_2}{\sqrt{n}}$$

$$F = mg = m_1 g_2 = m_2 g_1 \qquad \Leftrightarrow \qquad F = G\frac{m_1 m_2}{R^2}$$

For the system earth-sun

$$M_S = 2\times10^{30} \;; \qquad M_T = 6\times10^{24} \;; \qquad D_{TS} = 1.5\times10^{11}$$

$$g_T = \frac{GM_T}{D_{TS}{}^2} = 1.78\times10^{-8} \;; \qquad g_S = \frac{GM_S}{D_{TS}{}^2} = 5.93\times10^{-3}$$

$$F = G\frac{M_T M_S}{D_{TS}{}^2} = 3.56\times10^{22}\,N$$

$$g = \sqrt{g_T g_S} = 1.03\times10^{-5} \;; \qquad M = \sqrt{M_T M_S} = 3.46\times10^{27}$$

$$F = Mg = 3.56\times10^{22}\,N$$

Potential field of orbital speed

The particles don't oscillate, so they don't emitte energy. They have a static electromagnetic field.

They have a potential field of orbital speed that generates the gravitational accelerations.

The variations of the field need energy, virtual photons. And propagate at c2/w or c2/v – the group speed.

Microscopic acceleration:

$$g = \frac{1}{2}\frac{d(w^2)}{dx} \quad ; \qquad w = \sqrt{\frac{Gm}{R}} = \frac{cx}{\sqrt{k + x^2}}$$

Macroscopic acceleration:

$$g = \frac{d(v^2)}{dR} \quad ; \qquad v = \sqrt{\frac{Gm}{R}}$$

Gravitational constant of the electron:

$$G_e = \frac{{q_e}^2}{4\pi\varepsilon_0 {m_e}^2} = 2.78\times10^{32}\,m^{-3}$$

$$w_e = c = \sqrt{\frac{G_e m_e}{R_e}} \quad ; \qquad R_e = 2.82\times10^{-15}\,m$$

Classical radius of the electron:

$$R_e = \frac{x_e}{2\pi137} \quad ; \qquad x_e = 2.426\times10^{-12}\,m$$

Energy:

$$E = m_e c^2 = \frac{q_e^{\,2}}{4\pi\varepsilon_0 R_e} \qquad \Leftrightarrow \qquad R_e = \frac{q_e^{\,2}}{4\pi\varepsilon_0 m_e c^2} = 2.82\times10^{-15}$$

For the proton:

$$R_p = \frac{x_p}{2\pi 137} \qquad \Leftrightarrow \qquad R_p = \frac{q_e^{\,2}}{4\pi\varepsilon_0 m_p c^2} = 1.54\times10^{-18}\,m$$

$$w_p \approx c \approx \sqrt{\frac{G_p m_p}{R_p}}$$

True Planck units

Planck units are wrong because we can't mix the macroscopic gravitational constant with other microscopic units. Planck scale is a myth.

If we change the gravitational constant by the value for the electron everything works fine.

$$G = 6.67\times10^{-11} \qquad \rightarrow \qquad G_e = \frac{q_e^{\,2}}{4\pi\varepsilon_0 m_e^{\,2}} = 2.78\times10^{32}$$

Vacuum energy particle:

$$E = \left(\frac{\varepsilon_0}{\mu_0}\right)^2 = 310MeV$$

$$m = \sqrt{\frac{137\pi.h.c}{G_e}} = 5.53\times10^{-28}\,kg$$

$$x = \sqrt{\frac{hG_e}{137\pi.c^3}} = 4\times10^{-15}\,m$$

$$t = \sqrt{\frac{hG_e}{137\pi.c^5}} = 1.33\times10^{-23}\,s$$

Electron charge:

$$q_e = \sqrt{\frac{2G_e\varepsilon_0}{137^2\pi}}m = 1.6\times10^{-19}$$

Electron mass:

$$m_e = \sqrt{\frac{hc}{2\times137\pi.G_e}} = 9.1\times10^{-31}$$

$$G_0 = \frac{q_e{}^2}{4\pi\varepsilon_0 m^2} = 7.56\times10^{26}$$

$$\frac{G_e}{G_0} = 2\times137^2\pi^2$$

$$\frac{E}{E_e} = \frac{310}{0.51} = \sqrt{2}\pi137$$

Energy of the electron:

$$E_e = \frac{\varepsilon_0{}^2}{\sqrt{2}\pi.137\mu_0{}^2}$$

Mass of the proton:

$$m_p = \frac{3\varepsilon_0{}^2}{\mu_0{}^2 c w_p} \approx \frac{3\varepsilon_0{}^2}{\mu_0{}^2 c^2}$$

$$w_p{}^2 = h\frac{-h+\sqrt{h^2+4km^2c^2}}{2m^2k}$$

Energy of the proton:

$$E_p = 3\frac{\varepsilon_0^{\ 2}}{\mu_0^{\ 2}}$$

The electron's momentum formula

The electron magnetic moment is not a magnetic moment but only a momentum.
The true magnetic moment is the magnetic charge times the wavelength of the electron as the electric dipole moment (the electric dipole moment is a mass).

$$MM = q_m x_e = \frac{h}{2q_e} x_e = 5.0165 \times 10^{-27} m^4 s^{-1}$$

We don't know why but the electron momentum in hydrogen atom has four components related with a particle with the energy:

$$E = \frac{\varepsilon_0^{\ 2}}{\mu_0^{\ 2}} = 310 MeV$$

Momentum formula:

$$\mu_e = \frac{m_e c}{137}\left(1 + \frac{\varepsilon_0}{x_e}\right)\left(1 + \frac{m_e c^2 \mu_0^{\ 2}}{\varepsilon_0^{\ 2}}\right) = 9.2848 \times 10^{-24} m^7 s^{-3}$$

$q_m =$ Unitary magnetic charge

$x_e =$ Electron's wavelength

$h =$ Planck's constant

$q_e =$ Unitary electric charge

$\varepsilon_0 =$ Vacuum permittivity

$\mu_0 =$ Vacuum permeability

$m_e =$ Electron's mass

c = Light speed

$\frac{c}{137} =$ Electron's orbital speed

Quarks u, d and Monopole

Three quarks bonded together gives the proton mass. The mass of the quark is much greater then the proton.

Binding energy:

$$E = (3m_{qk} - m_p)cw = FR$$

$$F = \frac{khf^4}{w^3} \; ; \qquad R = \frac{nx}{2\pi} \; ; \qquad n \approx 3 \qquad \Leftrightarrow$$

$$\Leftrightarrow \qquad x\sqrt{k + x^2} = \frac{k}{2\pi}$$

Wavelength of the quark:

$$x = 2.2 \times 10^{-18} m$$

$$m_{qk} = \frac{h\sqrt{k + x^2}}{cx^2} = 6.4 \times 10^{-24} kg$$

Binding energy of the quarks:

$$E = FR = \frac{3ckh}{2\pi x^2 \sqrt{k + x^2}} = 1.68 TeV$$

The mass has the sign of the charge.

Monopole

Magnetic and unified forces:

$$\frac{q_m{}^2}{\mu_0 R^2} = \frac{khf^4}{w^3} \;; \qquad R = \frac{x}{2\pi} \;; \qquad q_m = \frac{h}{2q_e} \qquad \Leftrightarrow$$

$$\Leftrightarrow \qquad x\sqrt{k + x^2} = \frac{kc\mu_0 q_e{}^2}{\pi^2 h} \qquad \Leftrightarrow \qquad x = 2.1\times10^{-20}\,m$$

Quarks are made of two monopoles like electrons and neutrinos.

$$m_{MP} = 7.1\times10^{-20}\,kg$$

Force between a proton and an electron

Newton's force:

$$F_{pe} = \frac{G_{pe} m_e m_p}{R_B{}^2} = 8.2\times10^{-8}\,N$$

Electric force:

$$F_{pe} = \frac{q_e{}^2}{4\pi\varepsilon_0 R_B{}^2} = 8.2\times10^{-8}\,N$$

$$F_{pe} = g_{pe} m_e = 8.2\times10^{-8}\,N$$

Gravitational constant:

$$G_{pe} = \sqrt{G_e G_p}$$

$$G_e = \frac{q_e^{\ 2}}{4\pi\varepsilon_0 m_e^{\ 2}} \ ; \qquad G_p = \frac{q_e^{\ 2}}{4\pi\varepsilon_0 m_p^{\ 2}}$$

Acceleration:

$$g_{pe} = \sqrt{g_e g_p}$$

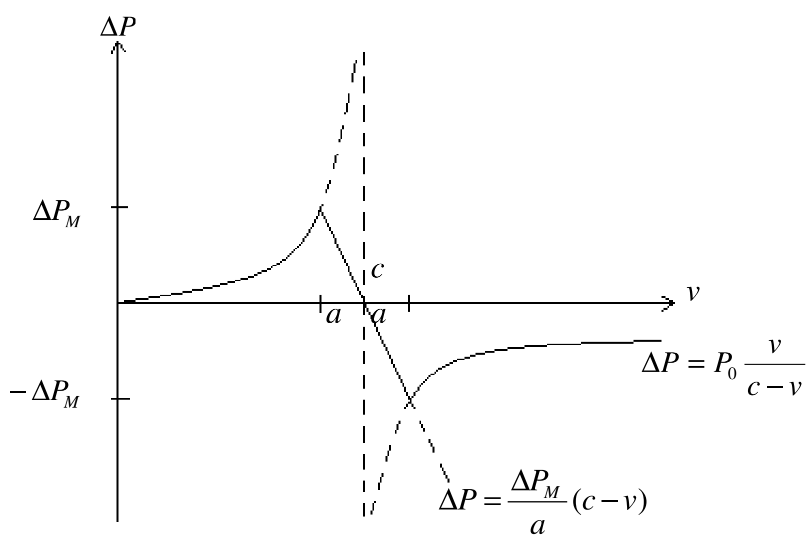
$$g_e = \frac{kf_e^{\ 3}}{c} = 1.15\times10^{18} \ ; \qquad g_p = \frac{kf_p^{\ 3}}{c} = 7.77\times10^{27}$$

$$g_{pe} = \frac{kf_{pe}^{\ 3}}{c} \ ; \qquad f_{pe} = \sqrt{f_e f_p}$$

R_B = Bohr's radius

Sonic Boom Pressure

The equation of the variation of the pressure with the speed goes to infinity when v = c. But infinity doesn't exist in nature. The graphic represents the double sonic boom.



$$P = P_0 \frac{c}{c-v} \quad ; \qquad \Delta P = P - P_0 = P_0 \frac{v}{c-v}$$

c = sound speed = $340 ms^{-1}$; $P_0 =$ atmospheric pressure = $1\times10^4 kg/m^2$

$\Delta P_M (at30m) = 736 kg/m^2$; Pressure times a volume is a constant $\Leftrightarrow$

$$\Delta P_M (1m) = 2\times10^7 kg/m^2$$

$$\begin{cases} \Delta P = P_0 \dfrac{v}{c-v} = \dfrac{\Delta P_M}{a}(c-v) \\ v = c \pm a \end{cases} \qquad \Leftrightarrow$$

$$a = \frac{P_0 c}{P_0 + \Delta P_M} = 0.17 ms^{-1}$$

Hydrogen Intensities and Frequencies

$$I = \frac{2.\pi.R_H}{(n_1+1)^2(n_2+1)^4} \quad (Wm^{-2}) \ ; \qquad R_H = 1.0974\times10^7$$

n1\ n2	1	2	3	4	5	6	7	8	9
1	0	$2.29E^5$	$7.24E^4$	$2.97E^4$	$1.43E^4$	$7.74E^3$	$4.54E^3$	$2.82E^3$	$1.86E^3$
2		0	$3.22E^4$	$1.32E^4$	$6.37E^3$	$3.43E^3$	$2.01E^3$	$1.25E^3$	825.1
3			0	$7.43E^3$	$3.58E^3$	$1.93E^3$	$1.14E^3$	709.6	462.0
4				0	$2.28E^3$	$1.24E^3$	726.1	445.5	297.0
5					0	858.1	511.6	313.5	214.5
6						0	363.0	231.0	151.8
7							0	181.5	115.5
8								0	92.4
9									0

$$f = cR_H\left(\frac{1}{n_1^{\ 2}} - \frac{1}{n_2^{\ 2}}\right) \qquad\qquad n_2 > n_1$$

n1\n2	1	2	3	4	5	6	7	8	9
1	0	2.47^{15}	2.92^{15}	3.08^{15}	3.16^{15}	3.20^{15}	3.22^{15}	3.24^{15}	3.25^{15}
2		0	4.57^{14}	6.17^{14}	6.91^{14}	7.31^{14}	7.55^{14}	7.71^{14}	7.82^{14}
3			0	1.60^{14}	2.34^{14}	2.74^{14}	2.98^{14}	3.14^{14}	3.25^{14}
4				0	7.40^{13}	1.14^{14}	1.38^{14}	1.54^{14}	1.65^{14}
5					0	4.02^{13}	6.44^{13}	8.00^{13}	9.10^{13}
6						0	2.42^{13}	4.00^{13}	5.10^{13}
7							0	1.57^{13}	2.65^{13}
8								0	1.08^{13}
9									0

$$\frac{I_{29}}{I_{28}} = \frac{I_{39}}{I_{38}} = \frac{I_{49}}{I_{48}} \ ; \qquad \frac{I_{28}}{I_{25}} = \frac{I_{48}}{I_{45}}$$

Scale Constant of Avogadro

Avogadro constant is a scale factor between the micro cosmos and the macro cosmos.

Gravitational constant: $G = \dfrac{c^3}{H_0 M_U} = 6.67\times10^{-11} m^{-3}$

c – light speed ; H_0 -- Hubble constant ; M_U -- mass of the universe

$$G = \frac{3}{4\pi\lambda_G{}^3} \quad \Leftrightarrow \quad \lambda_G = 1.53\times10^3 m$$

$\lambda_G =$ wavelength of the universe ; $R_U = \dfrac{c}{H_0}$ -- Radius of the universe

$n\lambda_G = 2\pi R_U$ -- Quantization condition

$n \approx 6\times10^{23}$ -- Avogadro constant

Quantum of mass:

$M = \lambda_G{}^4 c^2 = 5\times10^{29} kg$ -- Average star

Number of stars:

$$n = \frac{M_U}{M} \approx 6\times10^{23}$$

The universe has a mole of stars

Avogadro constant:

$$N_A = \frac{PV}{k_B T}$$

P – pressure; V – volume; k_B -- Boltzmann's constant; T – temperature

PV – macro energy ; $k_B T$ -- micro energy

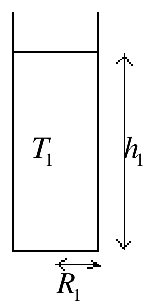
$\dfrac{PV}{T}$ -- macro entropy ; k_B -- micro entropy

Experiment of temperature variation with surface

Temperature is an energy surface density.

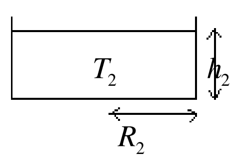
$$T = \frac{E}{S} \qquad \Leftrightarrow \qquad S_1 T_1 = S_2 T_2$$

We have some water in a cup with the dimensions:



$R_1 = 0.03m$ and $h_1 = 0.14m$ at the temperature $T_1 = 33^{\circ} C$

We transfer the water to another cup:



$R_2 = 0.05m$ and $h_2 = 0.05m$

And the water temperature rises 0.8ºC , so:

$$T_2 = 33.8^{\circ} C$$

Magnetic charge units

Magnetic/electric charges quantization:

$$q_m q_e = \frac{h}{2}$$

$$q_m = kg.m^2.s^{-1}.C^{-1} = kg.m^2.s^{-2}.A = Weber$$

q_m = magnetic charge; q_e = electric charge; h = Planck's constant

Wikipedia – Magnetic monopole

"In SI units, there are two conflicting conventions in use for magnetic charge. In one, magnetic charge has units Weber, while in the other, magnetic charge has units of Amper-meter."

Magnetic dipole moment (mdm):

$mdm = q_m.d$; d – distance

Mdm = Weber-meter

Wrong magnetic dipole moment:

$$\mu = I\pi R^2 = Ampere - meter.squared$$

$$Ampere.m^2 = q_m.d \quad \Leftrightarrow \quad q_m = Ampere - meter$$

This is wrong because the usual magnetic moment is only a linear momentum.

$$I\pi R^2 = p = kg.m.s^{-1}$$

$$q_m = Weber = magneticflux = outflow$$

Definition of mass

The mass is an electric dipole moment.

Electron:

$$m_e \approx q_e x_e$$

$$m_e = \frac{K_B}{x_e^2} q_e x_e$$

$K_B = 1.38 \times 10^{-23} m^2$ -- Boltzman constant; $m_e =$ mass of the electron

$q_e =$ Unitary electric charge; $x_e =$ Compton wavelength

Proton:

$$m_p = K_B \frac{q_e}{x_p} \quad ; \quad x_p = 1.32 \times 10^{-15} m$$

Boson w:

$$m_w \approx K_B \frac{q_e}{x_w} \quad ; \quad x_w = 1.54 \times 10^{-17} m$$

$$mxw = h \qquad \Leftrightarrow \qquad mx = \frac{h}{c} \approx K_B q_e$$

Light frequency

Wikipedia – Light

" When a beam of light crosses the boundary between two different media, the wavelength of the light changes but the frequency remains constant."

False, the frequency also changes.

$$v = c^2 w_0 \frac{n-1}{c^2 - n w_0^2} \quad ; \quad n = \frac{w}{w_0}$$

$$t = \frac{t_0 + vx_0 / c^2}{\sqrt{1 - v^2 / c^2}} \qquad \Leftrightarrow \qquad f = f_0 \sqrt{\frac{c - v}{c + v}}$$

$$f = f_0 \sqrt{\frac{c^2 - nw_0{}^2 - ncw_0 + cw_0}{c^2 - nw_0{}^2 + ncw_0 - cw_0}} \qquad \Leftrightarrow \qquad f \neq f_0$$

Electromagnetic Longitudinal Waves

The vacuum, for frequencies > $1 \times 10^{26} Hz$ behaves as a plasma of electrons and positrons.

Cut off frequency

$$f_M = \frac{c}{\sqrt{k}} = \sqrt{\frac{n_e q_e{}^2}{\varepsilon_0 m_e}} \qquad \Leftrightarrow \qquad n_e = 1.52 \times 10^{47} m^{-3}$$

Debye length

$$\sqrt{k} = \sqrt{\frac{\varepsilon_0 E_e}{q_e{}^2 n_e}} \quad ; \qquad E_e = m_e c^2 = 0.511 MeV$$

Speed of the longitudinal waves

$$w = \sqrt{k} f \qquad ; \quad f \text{ -- frequency}$$

The wavelength is a constant

$$x = \sqrt{k} = 1.4 \times 10^{-17} m$$

Mass

$$m = -\frac{h}{kf}$$

Energy is also a constant

$$E = -\frac{hc}{\sqrt{k}} = -89.6GeV$$

Cosmic Microwave Background Radiation

The cosmic background radiation is generated by the universe rotation.

$$c^2t^2 - x^2 = k \qquad \text{and} \qquad k = 1.9\times10^{-34}m^2$$

$$t = \frac{x}{w} \;; \qquad t = \frac{1}{f} \;; \qquad w = \frac{cx}{\sqrt{k + x^2}}$$

$$\frac{dw}{dx} = f_R = \frac{kf^3}{c^2} \qquad \Leftrightarrow$$

$$\Leftrightarrow \qquad \frac{H_0}{2\pi} = \frac{k}{c^2}\left(\frac{k_BT}{h}\right)^3$$

c – light speed; H_0 -- Hubble constant $= 2.3\times10^{-18}Hz$

$\frac{H_0}{2\pi}$ -- frequency of rotation of the universe; k_B -- Boltzmann constant

h – Planck constant

T – temperature of background radiation = 2.7K

$$T = \frac{h}{k_B}\sqrt[3]{\frac{c5}{2\pi.kGM_U}} = 2.7K$$

G – gravitational constant; Mu – mass of the universe

Magnetic potential equation – II

$$\frac{dA}{dt} = -\frac{A}{3}\frac{d^2A}{dx^2} + v^2$$

A – magnetic potential; $v^2 =$ electric potential or gravitational potential

$$t = \frac{\sqrt{k + x^2}}{c} \quad ; \quad dt = \frac{x}{c^2 t}dx$$

Free particle: $$c\frac{dA}{dx} = -\frac{cx}{3}\frac{d^2A}{dx^2}$$

Solution:

$$A = A_0 \sin\left(\frac{4\pi^2}{x^2}\left(c^2t^2 - x^2\right)\right) = A_0\frac{4\pi^2 k}{x^2}$$

With an electric potential:

$$\frac{dA}{dx} = -\frac{x}{3}\frac{d^2A}{dx^2} + \frac{v^2}{c} \quad \text{and} \quad v^2 = \frac{q_e}{4\pi\varepsilon_0 {R_B}^2} = 5.1\times10^{11} m^2 s^{-2}$$

Solution:

$$A = A_0\frac{4\pi^2 k}{x^2} + \frac{v^2 x}{c}$$

$$A_0 = \frac{Ax^2}{4\pi^2 k} \quad \text{and} \quad A = cx_e \quad \text{, for the electron}$$

$$A_0 = 5.66\times10^5 m^2 s^{-1} \quad \text{or}$$

$$\frac{dA_0}{dx} = B_0 \quad \Leftrightarrow \quad A_0 = B_0 x_e \quad \text{and} \quad B_0 = 2.9353\times10^{17} ms^{-1}$$

$$\Leftrightarrow \quad A_0 = 7.12\times10^5$$

$B_0 =$ Reference magnetic field

The Einstein's space-time doesn't exist

The Lorentz's equations are the mathematical basis of the relativity theory.

From the Lorentz's equations:

$$\begin{cases} x = \dfrac{x_0 + vt_0}{\sqrt{1 - v^2 / c^2}} \\ t = \dfrac{t_0 + vx_0 / c^2}{\sqrt{1 - v^2 / c^2}} \end{cases} \Leftrightarrow$$

$$\Leftrightarrow \quad \begin{cases} v^2 (c^2 t_0{}^2 + x^2) + 2c^2 v x_0 t_0 + c^2 (x_0{}^2 - x^2) = 0 \\ v^2 (x_0{}^2 + c^2 t^2) + 2c^2 v x_0 t_0 + c^4 (t_0{}^2 - t^2) = 0 \end{cases}$$

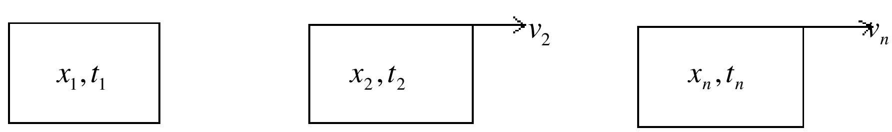
Equalling the coefficients we remove the variable *v*:

$$\frac{2c^2 x_0 t_0}{c^2 t_0{}^2 + x^2} = \frac{2c^2 x_0 t_0}{x_0{}^2 + c^2 t^2} \quad \Leftrightarrow \quad c^2 t^2 - x^2 = c^2 t_0{}^2 - x_0{}^2$$

$$\frac{c^2 (x_0{}^2 - x^2)}{c^2 t_0{}^2 + x^2} = \frac{c^4 (t_0{}^2 - t^2)}{x_0{}^2 + c^2 t^2} \quad \Leftrightarrow \quad c^2 t^2 - x^2 = c^2 t_0{}^2 - x_0{}^2$$

This is the invariance equation.

For *n* relative frames with v_n relative speeds:



$$\begin{cases} x_2 = \dfrac{x_1 + v_2 t_1}{\sqrt{1 - v_2{}^2 / c^2}} \\ t_2 = \dfrac{t_1 + v_2 x_1 / c^2}{\sqrt{1 - v_2{}^2 / c^2}} \end{cases} \Leftrightarrow \quad c^2 t_2{}^2 - x_2{}^2 = c^2 t_1{}^2 - x_1{}^2$$

$$\begin{cases} x_n = \dfrac{x_1 + v_n t_1}{\sqrt{1 - v_n^{\ 2}/c^2}} \\ t_n = \dfrac{t_1 + v_n x_1 / c^2}{\sqrt{1 - v_n^{\ 2}/c^2}} \end{cases} \qquad \Leftrightarrow \qquad c^2 t_n^{\ 2} - x_n^{\ 2} = c^2 t_1^{\ 2} - x_1^{\ 2}$$

$v_x = c^2 \dfrac{v_n - v_2}{c^2 - v_n v_2}$ -- Relative speed between 2 and n according with relativity.

The value of the speed doesn't mater, we only need that it exists.

$$\begin{cases} x_n = \dfrac{x_2 + v_x t_2}{\sqrt{1 - v_x^{\ 2}/c^2}} \\ t_n = \dfrac{t_2 + v_x x_2 / c^2}{\sqrt{1 - v_x^{\ 2}/c^2}} \end{cases} \qquad \Leftrightarrow \qquad c^2 t_n^{\ 2} - x_n^{\ 2} = c^2 t_2^{\ 2} - x_2^{\ 2}$$

So:

$$c^2 t_1^{\ 2} - x_1^{\ 2} = c^2 t_2^{\ 2} - x_2^{\ 2} = \cdots = c^2 t_n^{\ 2} - x_n^{\ 2} \qquad \Leftrightarrow$$

$$c^2 t_n^{\ 2} - x_n^{\ 2} = k \quad \text{(Constante)}$$

According to Einstein k is a variable, what is an error.

So *x* and *t* are not independent variables space and time. The relativity theory says that k = 0 for light, being x the wavelength and t the period of an electromagnetic wave. That means that x and t are always wavelength and period. So, the space-time doesn't exist. A direct consequence is that the vacuum light speed is variable with the frequency:

$$w = \sqrt{c^2 - kf^2}$$

We can calculate the value of k:

$$k = 1.9 \times 10^{-34} m^2$$

So the relativity theory is a particular case of our theory without space-time.

Photons of the gravitational field

The background radiation photons are the "virtual" photons of the gravitational field of the universe.

Gravitational field of the universe:

$$g_U = \frac{GM_U}{R_U^{\ 2}} = 6.9\times10^{-10}$$

Frequency of the background radiation:

$$f = \frac{k_B 2.7}{h} = 5.6\times10^{10}$$

Acceleration field of the photon:

$$c^2t^2 - x^2 = k \qquad \text{and} \qquad k = 1.9\times10^{-34}$$

$$w = \frac{x}{t}$$

$$\frac{dw}{dt} = g = \frac{kf^3}{w} \qquad \text{and} \qquad w = c$$

The acceleration field of the photon is equal to the acceleration of the universe:

$$\frac{g_U}{2\pi} = \frac{kf^3}{c}$$

Photons of the earth gravitational field:

$$g = 9.8 = \frac{kf^3}{c} \qquad \Leftrightarrow \qquad f = 2.48\times10^{14}\,Hz$$

Double sonic boom pressure

In nature there are no infinites.

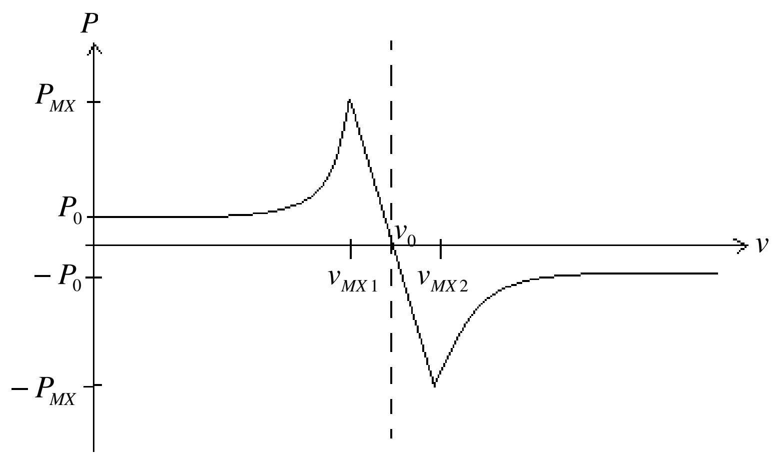
Pressure formula:

$$P = P_0 + \frac{P_{MX} - P_0}{(v_{MX1} - v_0)e^{-1/2}}(v - v_0)e^{-\frac{(v-v_0)^2}{2(v_{MX1}-v_0)^2}}$$

P_{MX} -- Positive maximum; v_0 -- Vertical asymptote speed

P_0 -- Normal pressure; v -- Speed

v_{MX1} -- Speed for positive maximum, P – Pressure



Longitudinal Waves from Particles

The particles, including photons, emitte two types of waves: transverse waves with speed lower than light speed and longitudinal waves with superluminal speed.

Energy of a wave-particle:

$$E = mcw = \frac{hcf}{w} \qquad \Leftrightarrow \qquad m = \frac{hf}{w^2}$$

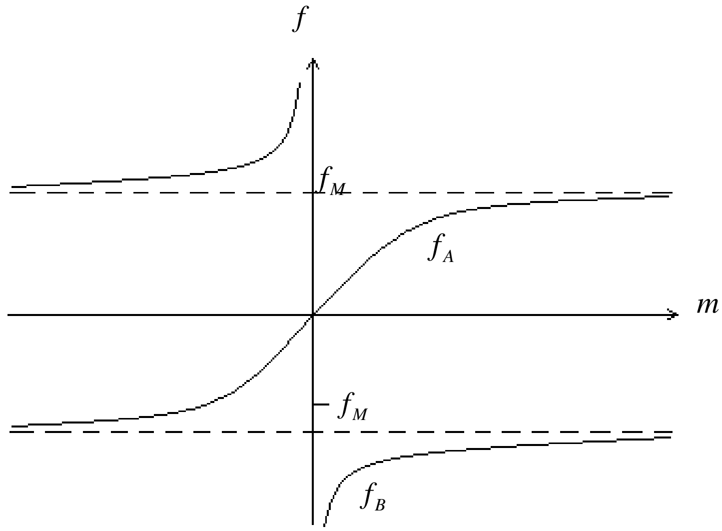
And $w = \sqrt{c^2 - kf^2}$; $k = 1.9 \times 10^{-34} m^2$

Frequency: $$f = \frac{-h \pm \sqrt{h^2 + 4km^2c^2}}{2mk}$$

Transverse waves: $$f_A = \frac{-h + \sqrt{h^2 + 4km^2c^2}}{2mk}$$

Longitudinal waves: $$f_B = -\frac{h + \sqrt{h^2 + 4km^2c^2}}{2mk}$$

$f_A f_B = \frac{c^2}{k} = f_M{}^2$; f_M -- Frequency of the macroscopic matter



For the visible photon: $f_A = 5\times 10^{14}\,Hz \quad \Leftrightarrow$

$\Leftrightarrow \quad f_B = 9.38\times 10^{35}\,Hz$

Speed: $w_B = 1.3\times 10^{19}\,ms^{-1}$

Energy: $E_B = \dfrac{hcf}{w} = 89.5GeV$

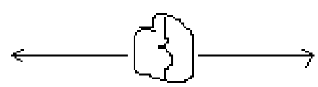
For the electron: $f_A = 1.2\times 10^{20} \quad \Leftrightarrow \quad f_B = 3.9\times 10^{30}$

$w_B = 5.4\times 10^{13}$

Classical and Quantum Entanglement

The classical and quantum entanglement behaves the same way.
All the mysteries of quantum mechanics are errors.

We have a mass of 10 that receives a momentum of 100. It divides in two pieces with masses m_1 and m_2 and speeds v_1 and v_2.

$p_1 = m_1 v_1$  $p_2 = m_2 v_2$

$$|m_1 v_1| + |m_2 v_2| = 100 \;; \qquad m_1 + m_2 = 10$$

The resulting momentums are entangled.
Let's use the Bell's inequality:

Property A = $p_1 > 50$
Property B = $m_1 > 5$
Property C = $p_2 > 50$

$$(A, \overline{B}) + (B, \overline{C}) \geq (A, \overline{C}) \qquad \Leftrightarrow$$

$$\Leftrightarrow \qquad (p_2 > 50, m_1 < 5) + (m_1 > 5, p_1 < 50) \geq (p_2 > 50, p_1 < 50)$$

$$\Leftrightarrow \qquad (50\% \times 50\%) + (50\% \times 50\%) \geq (100\%)$$

$$\Leftrightarrow \qquad \frac{1}{4} + \frac{1}{4} \geq 1$$

As the momentums are entangled the Bell's inequality is violated.

First, a quantum measurement of spin or polarization is not a measurement.
The entangled (or not) particles have a precise value of spin or polarization before the "measurement".
There is no expanding wave-function because x and t in the Schrödinger equation are not space and time but wavelength and period.

Massic current

Massic current:

$$I_{MS} = \frac{m}{t} = L^3 V^3 = Magnetic.pole.strength$$

Power and massic resistance:

$$P = R_{MS} I_{MS}^{\ 2} \quad \Leftrightarrow \quad R_{MS} = L^{-3} V^{-1} = Inverse.true.magnetic.dipole.moment$$

The massic voltage is an electric field:

$$V_{MS} = R_{MS} I_{MS} = V^2 = \vec{E}$$

Energy:

Electric -- $E = q_e V_e$ (Electric charge and electric voltage)

Magnetic -- $E = q_m V_m$ (Magnetic charge and magnetic voltage)

Massic -- $E = mV_{MS} = m\vec{E} = mc^2$ (Massic charge and massic voltage)

Massic resistance of the vacuum:

$$R_{MS0} = \frac{1}{\varepsilon_0^{\ 3} c} = 4.8 \times 10^{24}$$

$\varepsilon_0^{\ 3} c =$ Magnetic dipole moment of the vacuum

Massic capacity of the electron:

$$C_{MS} = \frac{m_e}{c^2} = 1 \times 10^{-47} = L^4$$

Massic permittivity:

$$\varepsilon_{0MS} = L^3 = \frac{1}{G}$$

Wavelength-frequency

For an electromagnetic wave on a medium transition when the wavelength varies also varies the frequency:

$$\frac{c^2}{f^2} - x^2 = k \qquad \Leftrightarrow \qquad f = \frac{c}{\sqrt{k + x^2}}$$

$$\Delta f = -\frac{cx}{(k + x^2)^{3/2}} \Delta x$$

For visible light -- $x = 6 \times 10^{-7} m \qquad \Leftrightarrow \qquad \Delta f = -8.34 \times 10^{20} \Delta x$

In Shrodinger equations x and t are not space and time but wavelength and period of a wave-particle.

Vacuum energy of the cosmic background radiation

$f = 5.6 \times 10^{10} Hz$ -- frequency

$E = hf = 2.3 \times 10^{-4} eV$ -- energy

Number of background photons in the universe:

$$n = \frac{2 \times 10^{88}}{\frac{4}{3}\pi R_U{}^3} = 2.2 \times 10^9 / m^3 \; ; \qquad R_U = \text{radius of the universe}$$

Total energy:

$$E_T = En / m^3 = 0.5 MeV / m^3$$

Number of electrons in the universe:

$$n_e = \frac{1 \times 10^{79}}{\frac{4}{3}\pi R_U{}^3} = 1 / m^3$$

The total energy of the background photons per cubic meter is equal to the energy of one electron.

Electric field from a rotating magnetic charge

$$\vec{E} = \frac{q_m v}{R^2}$$

Neutrino

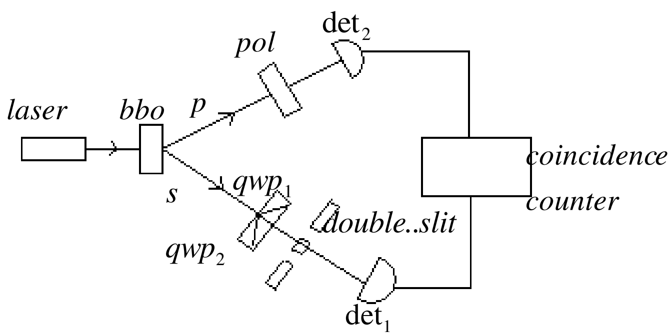
The frequency of the electron neutrino is equal to the frequency of the visible light.

Double slit quantum eraser – a new experiment

Orthodox experiment: two entangled photons, s and p, are produced at a beta-barium borate crystal by spontaneous parametric down conversion. The s photon passes by a which-way marker, two quarter-wave plates, and to a double slit. Then it goes to the detector det1.

The p photon passes to a linear polarizer and goes to the detector det2. The coincidence counter regists the event.

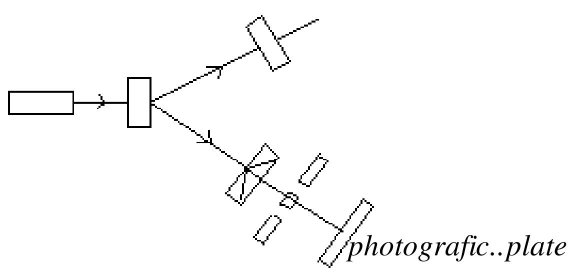
According to the orthodox explanation we get a image of interference because the linear polarizer erases the which-way knowledge, even if the photon p enters the polarizer after the photon s passes the double slit.



We think that the result is due to time variations at the detectors because of the polarizer.

But there's a way of proving that:

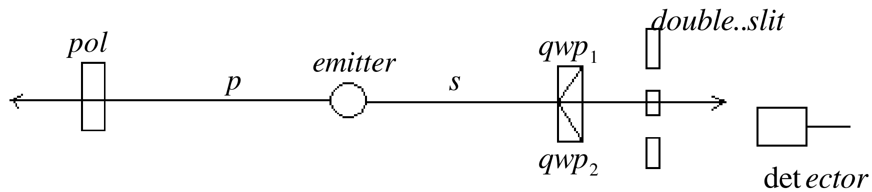
If the orthodox explanation is true we must get the same result with another experiment.



If there's a instantaneous or from the future communication between the photons we should get a interference picture.

We think that the result would be no interference.

Instantaneous Communication



We have an emitter of entangled photons s and p.

The s photon passes a which-way marker, two quarter-wave polarizers, and a double slit. Then we have a photo detector placed at the position of a dark fringe. When there's interference it detects no light, a digital zero.

The p photon passes a linear polarizer that can be removed to produce a digital one at the detector. With it placed at the beam we have a digital zero.

According to the orthodox interpretation of quantum mechanics this must work.

We think that this doesn't work.

According to our theory the speed of communication between visible photons is:

Frequency:

$$f_B = \frac{{f_M}^2}{f_A} \quad ; \qquad f_M = \frac{c}{\sqrt{k}} \quad ; \qquad f_A = 5 \times 10^{14}\, Hz$$

$$f_B = 9.4 \times 10^{35}\, Hz$$

Speed:

$$w_B = \sqrt{k}\, f_B \qquad \Leftrightarrow \qquad w_B = 1.3 \times 10^{19}\, ms^{-1}$$

Double orbit of the electron

$$f = f_R\left(\frac{1}{n_1^{\ 2}} - \frac{1}{n_2^{\ 2}}\right)$$

f = frequency ; $f_R =$ Rydberg frequency

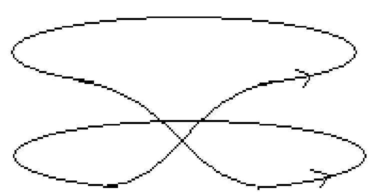
$$f_R = \frac{c}{2x_e 137^2} = 3.3\times10^{15}\,Hz$$

Orbital frequency:

$$f_O = \frac{v}{Perimeter} = \frac{c}{x_e 137^2} = 6.6\times10^{15}\,Hz$$

$$f_R = \frac{f_O}{2} \qquad \Leftrightarrow \qquad t_R = 2t_O$$

The Rydberg period is two times the orbital period.
That means that the electron has a double orbit.



Perimeter of one orbit:

$$P_1 = 137x_e + 0.036x_e$$

$x_e =$ Compton wavelength of the electron

It's the reason why the inverse fine structure constant is not an integer.

It's why the giromagnetic ratio is two times the classical value:

$$\gamma_e = \frac{momentum}{angular..momentum} = \frac{q_e}{2m_e} g_e$$

(The orthodox magnetic moment is only a linear momentum)

$g_e = 2.00232$ -- Landé g factor ; $\quad g_e = 2 + \frac{1}{137\pi}$

Angular momentum = $\frac{h}{4\pi} = spin$; $\quad mvR = \frac{h}{2\pi} =$ angular momentum

$$\gamma_e = L^{-1} = 1.761\times10^{11} ; \quad \frac{1}{\gamma_e} = 5.68\times10^{-12}\, m$$

$$\frac{5.68\times10^{-12}}{x_e} = 2.34 = \frac{m_e}{q_e x_e}$$

Virtual Photons

Virtual photons must exist to transport the forces but they are undetectable.
They are longitudinal waves of great frequency and constant wavelength with speeds greater than light speed.

The electron has a field of rotation:

$$w_e = c ; \quad f_e = 1.2\times10^{20}\, Hz ; \quad x_e = 2.426\times10^{-12}\, m$$

For virtual photons the quotient between electric and magnetic fields is greater than light speed:

$$\frac{E}{B} > c$$

Virtual photons of the electron:

$$f_B = \frac{{f_M}^2}{f_e} = 3.91\times10^{30}\, Hz ; \quad f_M = \frac{c}{\sqrt{k}} ; \quad k = 1.9\times10^{-34}\, m^2$$

Speed of the virtual photons:

$$w_B = \sqrt{k} f_B = 5.41 \times 10^{13} ms^{-1}$$

This is the speed of the electric force.

For the neutrino:

$$f_B = 8.9 \times 10^{35} Hz \; ; \qquad f = 5.3 \times 10^{14} Hz$$

$w_B = 137c^2$; Neutrino mass: $m = 3.9 \times 10^{-36} kg$

The wavelength of the virtual photons is a constant:

$$x = \sqrt{k} = 1.384 \times 10^{-17} m$$

The rest energy is also a constant:

$$E = \frac{hc}{\sqrt{k}} = 89.6 GeV$$

God doesn't exist

The nothing is eternal.
The nothing doesn't admit it self, so the nothing is unstable. It divides in symmetric speeds and distances as: 0 = +V+(-V) and 0 = +L+(-L)
This is the existence and the existence is eternal.
The universe is not expanding. It is rotating with constant angular speed. The bigbang never happens so no one is needed to start the existence. The local linear speed of the universe is "light speed".
The observed red shift of the galaxies is a transverse red shift.
The first physical reality, after the speed and the distance, is the magnetic vector potential or circulation: A = VL
The number of stars of the local universe is equal to Avogadro constant. The universe has a center of rotation and we are not at the center.
Matter and antimatter is defined by the sign of the mass. Antimatter has a negative mass. The mass has the sign of the charge. The electron is antimatter.
Macroscopic gravitation attracts both matter and antimatter.
The particles are all composed of monopoles and they are speed and distance vortexes.
The microcosm is equal to the macrocosm. The atom is equal to the solar system.

We will never know if light propagates in the vacuum because there are gravitational fields everywhere. The true vacuum is the gravitational field of the universe. It is a superfluid and a superconductor (2.7K).

The spin of the particles is due to the rotation of the universe, so the spin is quantized.

Electron Spin Speed

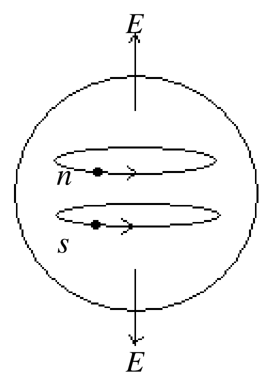
$$Spin_e = m_e vR = \frac{h}{4\pi}$$

Classical radius of the electron:

$$R = 2.82 \times 10^{-15} m = \frac{x_e}{2\pi 137}$$

$$\Leftrightarrow \qquad v = \frac{137c}{2} = 2.05 \times 10^{10} ms^{-1}$$

The electron is composed of two rotating monopoles.



Reference electric field of the electron:

$$E_0 = \frac{5\pi^2}{3}\frac{q_m v}{R^2} = 8.8 \times 10^{25} m^2 s^{-2}$$

x_e = Compton wavelength; $q_m = 2.07 \times 10^{-15} Weber = Magnetic..charge$

$$E = E_0 \sin\left(\frac{4\pi^2}{x_e^2}\left(c^2t^2 - x^2\right)\right) = E_0 \frac{4\pi^2 k}{x_e^2} = 1.13 \times 10^{17} m^2 s^{-2}$$

Longitudinal Waves and Absolute Time

For Einstein light is god. It's why light must be absolute.

Transverse light is relative. Causality is related not with transverse light but with longitudinal light with speeds faster than c.

Time doesn't exist in nature. Time is a derived unit from distance and speed. Distance can be replaced by any physical quantity.

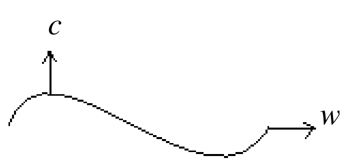
For longitudinal waves time is absolute.

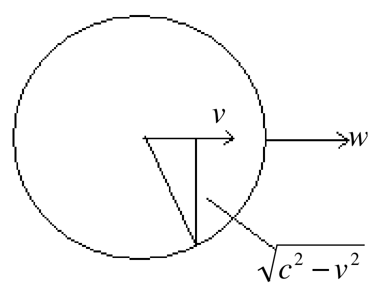
Transverse and longitudinal waves

$$\lim . c \to \infty \quad \begin{cases} x = \dfrac{x_0 + vt_0}{\sqrt{1 - v^2 / c^2}} \\ t = \dfrac{t_0 + vx_0 / c^2}{\sqrt{1 - v^2 / c^2}} \end{cases} = \begin{cases} x = x_0 + vt_0 \\ t = t_0 \end{cases}$$

$$\frac{x}{t} = \frac{x_0 + vt_0}{t_0} \quad \Leftrightarrow \quad w = w_0 + v$$

Transverse speed

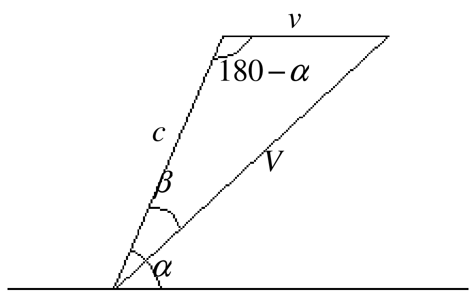




For transverse waves the period (time) is variable with the variation of the transverse speed of the transmission of the energy.

Is Light Speed Relative Or Not?

This is a test of the relativity postulate of light speed constancy, based on the phenomenon of the astronomical aberration.



$$\frac{V}{\sin(180-\alpha)} = \frac{v}{\sin\beta} \qquad \Leftrightarrow \qquad \sin\beta = \frac{v}{V}\sin\alpha$$

β = Astronomical aberration

Classical V:

$$V_C = \sqrt{c^2 + v^2 + 2vc\cos\alpha}$$

Relativistic V:

$$V_R = c$$

We have a maximum $\Delta\beta$ for $\alpha = \pi/4$; $v = 3\times10^4$

$$V_C = 2.99813672\times10^8$$

$$V_R = 2.99792458\times10^8$$

$$\beta_C = \frac{v}{V_C}\sin(\pi/4) = 7.07546233\times10^{-5}\,rad = 14.5942''$$

$$\beta_R = \frac{v}{c}\sin(\pi/4) = 7.07596301\times10^{-5}\,rad = 14.5952''$$

$$\Delta\beta = 1\times10^{-3}\,''$$

If it's possible to measure those angles with this precision, we can for the first time to test the light speed constancy postulate.

Correction of the Unified Acceleration

We have defined the unified gravitational acceleration as:

$$g = \frac{dw}{dt} \quad ; \quad c^2t^2 - x^2 = k \quad \Leftrightarrow \quad w = \frac{x}{t} = \frac{\sqrt{c^2t^2 - k}}{t}$$

And it gives:

$$g = \frac{kf^3}{w} \quad ; \quad k = 1.9 \times 10^{-34} m^2$$

f = Compton frequency; w = Speed of the wave

This formula is correct for the electron because $w_e = c$
But it must be replaced by another formula:

$$g = \frac{1}{2}\frac{d(w^2)}{dx} \quad \Leftrightarrow \quad g = \frac{kwf^3}{c^2} \quad ; \quad w = \frac{cx}{\sqrt{k + x^2}}$$

The equivalent macroscopic acceleration is:

$$g = \frac{1}{2}\frac{d(V^2)}{dR} \quad ; \quad V = \sqrt{\frac{2GM}{R}}$$

$V =$ Escape speed

The acceleration field is generated by the speed variation of the gravitons with distance. So, there is only one mechanism of generation of the gravitational field of the particles or the macroscopic masses.
The gravitons are photons of very low phase speed.

For the Earth:

$$M = 6 \times 10^{24} = \frac{hf_M}{w_M{}^2} \quad ; \quad f_M = \frac{c}{\sqrt{k}} = 2.166 \times 10^{25} Hz$$

$f_M =$ Compton frequency of the matter

$$g = 9.8 = \frac{kw_G f_M{}^3}{c^2}$$

$$w_M = 4.9 \times 10^{-17} ms^{-1} \quad ; \quad w_G = 4.5 \times 10^{-25} ms^{-1}$$

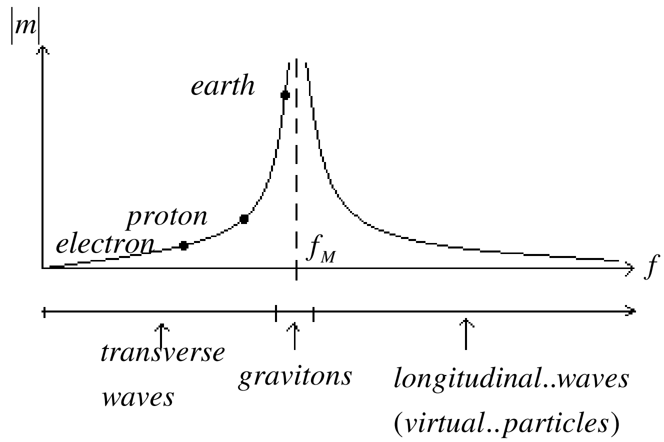
Group speed of the acceleration field:

$$V_G = \frac{c^2}{w_G} = 2\times10^{41}\, ms^{-1}$$

Compton wavelength of the gravitons:

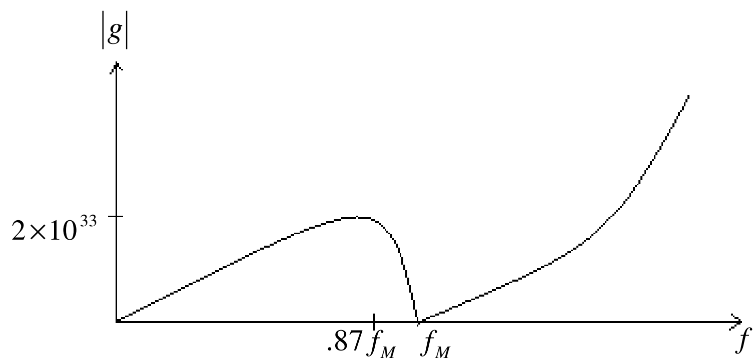
$$x_M = 2.26\times10^{-42}\, m \; ; \qquad x_G = 2.1\times10^{-50}\, m$$

All mass spectrum

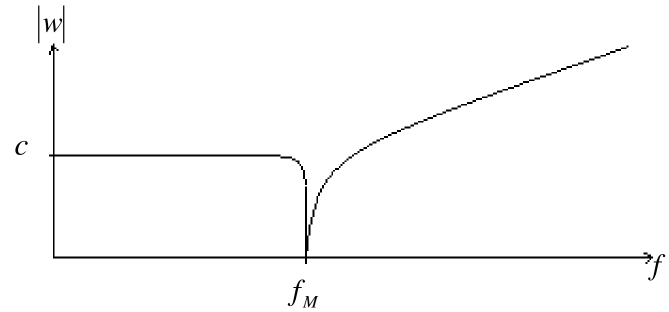


$|m|$ = mass module ; f = Compton frequency

Gravitational acceleration



Field speed:



Relative acceleration

$$g = \frac{kwf^3}{c^2} \quad ; \quad w = c^2 \frac{w_0 + v}{c^2 + vw_0} \quad ; \quad f = \frac{cf_0\sqrt{c^2 - v^2}}{c^2 + vw_0}$$

$$\Leftrightarrow \qquad g = \frac{kc^3 f_0{}^3 (w_0 + v)(c^2 - v^2)^{3/2}}{(c^2 + vw_0)^4}$$

For a black hole: $v = c \quad \Leftrightarrow \quad g = 0$
At the surface of a black hole the force is zero.

Unified relative force (between equal particles)

$$F = \frac{khf_0{}^4 (c^2 - v^2)^2}{(c^2 + vw_0)^3 (w_0 + v)}$$

Method of Solving Any Equation

We use the program QBASIC to solve the equations.

Equation a:

$$x^3 - 9x^2 + 26x - 24 = 0$$

$$x = 1$$

```
FOR N=1 TO 10000 STEP 1
```
$x = (9x^2 - 26x + 24) / x^2$ ⇔ $x = 4$
```
PRINT x
NEXT N
```

```
x = 1
FOR N=1 TO 10000 STEP 1
```
$x = 24/(x^2 - 9x + 26)$ ⇔ $x = 2$
```
PRINT x
NEXT N
```

$x^2(x-9) + 26x - 24 = 0$

$x = (24 - 26x)/(x-9)/x$ ⇔ $x = 3$

Some equations converge to the solutions. The initial x is any value, but some values don't converge.

Equation b:

$$Log(x) + x = 10$$

```
x = 2
FOR N=1 TO 10000 STEP 1
```
$x = 10 - LOG(x)$ ⇔ $x = 7.92942$
```
PRINT x
NEXT N
```

Equation c:

$$Sin(x) + Log(x) + x = 4$$

$x = 2$
```
FOR N=1 TO 10000 STEP 1
```
$x = 4 - SIN(x) - LOG(x)$ ⇔ $x = 2.475725$
```
PRINT x
NEXT N
```

———————————

The method also works for systems:

$$\begin{cases} yx^3 - 2y^2x + 4 = 0 \\ y^3x - 3y^2x^2 + 5 = 0 \end{cases}$$

```
x = 2
y = 3
FOR N=1 TO 10000 STEP 1
y = (2y^2x - 4)/x^3              ⇔      y = 17.97625
x = (y^3x + 5)/3/y^2/x           ⇔      x = 5.992943
PRINT x, y
NEXT N
```

This method must be better study.
Try to find other solutions.

Method of the Solutions Equations

Only for real solutions. Instead of solving the equation we solve the solutions equations.

$x^2 - 5x + 6 = 0$; solutions: a, b

$$\begin{cases} a + b = 5 \\ ab = 6 \end{cases}$$

Program:

```
a = 10
FOR n=1 TO 10000 STEP 1
b = 6/a
a = 5 - b
PRINT a, b
NEXT n
```

$x^3 - 9x^2 + 26x - 24 = 0$; solutions a, b, c

$$\begin{cases} a+b+c=9 \\ ab+ac+bc=26 \\ abc=24 \end{cases}$$

Program:

```
a = 10
b = 20
FOR n=1 TO 10000 STEP 1
c = 9 - a - b
b = (26 - ac)/(a + c)
a = 24/b/c
PRINT a, b, c
NEXT n
```

$x^4 - 10x^3 + 35x^2 - 50x + 24 = 0$; solutions a, b, c, d

$$\begin{cases} a+b+c+d=10 \\ ab+ac+ad+bc+bd+cd=35 \\ (a+b)cd+ab(c+d)=50 \\ abcd=24 \end{cases}$$

Program:

```
a = 10
b = 20
c = 30
FOR n=1 TO 10000 STEP 1
d = 10 - a - b - c
c = (35 - ab - bd - ad)/(a + b + d)
b = (50 - acd)/(cd + a(c + d))
a = 24/b/c/d
PRINT a, b, c, d
NEXT n
```

Complex solutions:

$n^2 + 2n + 10 = 0$; solutions: $a = x + iy$, $b = x - iy$

$$\begin{cases} 2x = -2 \\ x^2 + y^2 = 10 \end{cases}$$

$n^3 - 2n^2 + 2n - 40 = 0$;   solutions: a, $b = x + iy$, $c = x - iy$

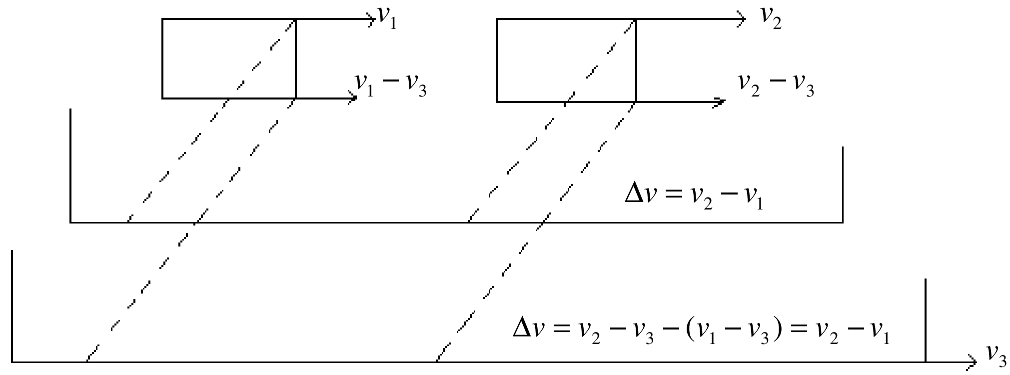
$$\begin{cases} a + 2x = 2 \\ 2ax + x^2 + y^2 = 2 \\ a(x^2 + y^2) = 40 \end{cases}$$

$n^4 - 3n^3 + 4n^2 - 42n + 40 = 0$; solutions: a, b, $c = x + iy$, $d = x - iy$

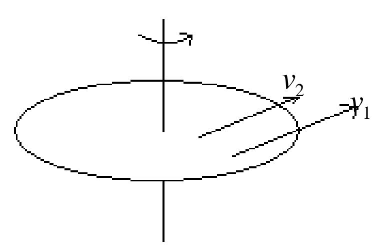
$$\begin{cases} a + b + 2x = 3 \\ ab + 2ax + 2bx + x^2 + y^2 = 4 \\ (a + b)(x2 + y2) + 2abx = 42 \\ ab(x^2 + y^2) = 40 \end{cases}$$

Absolute motion

The rotational movement of a point is always relative.
The rotational movement of a system with dimensions is absolute.
This is also true for linear movement.



A difference of speed is always absolute: $\Delta v = Constant$



$\Delta v = K$

Magnetic Dipole Moment Error

The magnetic dipole moment is only a linear momentum.

$IA = p$; I – Electric current; A – Area

The true magnetic dipole moment of the electron:

$\mu = q_m x$; q_m - Magnetic charge; x - Compton wavelength

$$q_m = \frac{h}{2q_e} \; ; \qquad \mu_e = 5\times10^{-27}\, m^4 s^{-1}$$

Momentum:

$$p = IA\,; \qquad I = \frac{q_e c}{N^2 x} \; ; \qquad A = \frac{N^2 x^2}{4\pi} \qquad \Leftrightarrow$$

$$\Leftrightarrow \qquad p = \frac{q_e c x}{4\pi}$$

Electron:

$$p_e = \frac{g_e}{2}\frac{q_e c x_e}{4\pi} = 9.3\times10^{-24}\,; \qquad g_e \approx 2$$

Proton:

$$p_P = \frac{g_p}{2}\frac{q_e c x_p}{4\pi} = 1.4\times10^{-26}\,; \qquad g_p = 5.6$$

$x_p =$ Compton wavelength of the proton

Neutron:

$$p_N = \frac{3.83}{2}\frac{q c x_N}{4\pi} = 9.66\times10^{-27}$$

Muon:

$$p_\mu = \frac{g_\mu}{2}\frac{q c x_\mu}{4\pi} = 4.5\times10^{-26}\,; \qquad g_\mu \approx 2$$

Gyromagnetic ratio

$$\gamma = 2\frac{momentum}{angular..momentum} = 2\frac{p}{h/2\pi}$$

Electron:

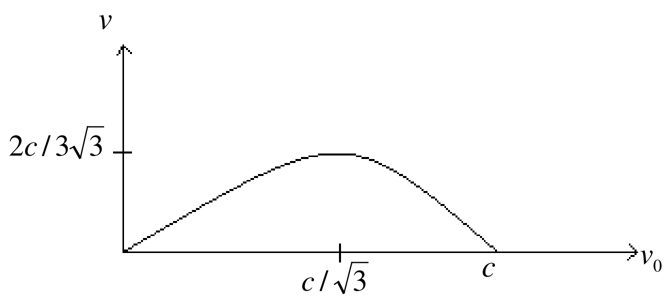
$$\gamma_e = \frac{g_e q_e c x_e}{2h} = 1.76\times 10^{11} m^{-1}$$

Proton:

$$\gamma_p = \frac{g_p q_e c x_p}{2h} = 2.675\times 10^{8} m^{-1}$$

The relative speed is also relative

$$v = v_0\left(1-\frac{v_0^{\,2}}{c^2}\right)$$



Momentum:

$$p = mv = \frac{m_0}{\left(1-\frac{v_0^{\,2}}{c^2}\right)^{3/2}} v_0\left(1-\frac{v_0^{\,2}}{c^2}\right) = \frac{m_0 v_0}{\sqrt{1-v_0^{\,2}/c^2}}$$

Angular momentum:

$$mvR = \frac{h}{2\pi} \quad ; \qquad h = h_0$$

$$\frac{m_0}{\left(1-v_0{}^2/c^2\right)^{3/2}} R_0 \sqrt{1-v_0{}^2/c^2}\, v_0 (1-v_0{}^2/c^2) = \frac{h}{2\pi}$$

Light speed variation with gravity

Energy:

$$E = \frac{E_0}{\sqrt{1-v^2/c^2}} \quad \Leftrightarrow \quad \left(\frac{\varepsilon}{\mu}\right)^2 = \left(\frac{\varepsilon_0}{\mu_0}\right)^2 \frac{1}{\sqrt{1-v^2/c^2}}$$

$$w_0{}^2 = \frac{1}{\varepsilon_0 \mu_0} \; ; \qquad w^2 = \frac{1}{\varepsilon\mu}$$

Speed:

$$w = w_0 (1-v^2/c^2)$$

Permittivity and permeability variation:

$$\varepsilon = \frac{\varepsilon_0}{(1-v^2/c^2)^{9/8}} \; ; \qquad \mu = \frac{\mu_0}{(1-v^2/c^2)^{7/8}}$$

With gravity:

$$\varepsilon = \frac{\varepsilon_0}{\left(1-\frac{2GM}{Rc^2}\right)^{9/8}} \; ; \qquad \mu = \frac{\mu_0}{\left(1-\frac{2GM}{Rc^2}\right)^{7/8}}$$

Helium and Lithium Energy Equations II

If wave-particle duality is valid it must exist a correct explanation for atomic physics with electrons as classical particles. This explanation it's best and easier than the quantum mechanics one.
The microcosm is equal to the macrocosm, the atoms are just like solar systems.

For the helium atom, the orbits of the electrons are two minimums of the energy:

$$\frac{dE}{dN} = f(N)(N^2 - (N_1 + N_2)N + N_1N_2) = 0$$

For the hydrogen N = 137.036, the inverse fine structure constant.
One partial energy (kinetic plus potential):

$$E_x = -\frac{m_e c^2}{2N^2} \quad \Leftrightarrow \quad \frac{dE_x}{dN} = \frac{m_e c^2}{N^3} \quad \Leftrightarrow \quad f(N) = \frac{m_e c^2}{N^5} \quad \Leftrightarrow$$

$$\Leftrightarrow \qquad \frac{dE}{dN} = \frac{m_e c^2}{N^3} - \frac{(N_1 + N_2)m_e c^2}{N^4} + \frac{N_1N_2m_e c^2}{N^5}$$

Ionization energies:

$$E = m_e c^2\left(-\frac{1}{2N^2} + \frac{N_1 + N_2}{3N^3} - \frac{N_1N_2}{4N^4} + C\right)$$

Counting from the nucleus:

$$E_1 = -8.72\times10^{-18}J \;; \quad E_2 = -3.94\times10^{-18}J$$

$$\frac{E_1}{m_e c^2} = \frac{-6N_1 + 4(N_1 + N_2) - 3N_2}{12{N_1}^3} + C_1 = -1.065\times10^{-4}$$

$$\frac{E_2}{m_e c^2} = \frac{-6N_2 + 4(N_1 + N_2) - 3N_1}{12{N_2}^3} + C_2 = -4.812\times10^{-5}$$

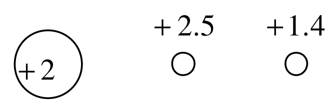
$$C_1 = 0 \;; \quad C_2 = -\frac{1}{2\times137^2} \;; \quad C_2 m_e c^2 = -13.6eV$$

$$\begin{cases} -1.065\times10^{-4} = \dfrac{N_2 - 2N_1}{12{N_1}^3} \\ -4.812\times10^{-5} = \dfrac{N_1 - 2N_2}{12{N_2}^3} - \dfrac{1}{2\times137^2} \end{cases}$$

$$N_1 = 54.7\,; \quad N_2 = -99.4$$

Effective charge:

$$Z_{ef} = \frac{137}{N}$$



Orbital frequency of the exterior electron:

$$f_{OR} = \frac{c}{x_e {N_2}^2} = 1.25\times10^{16}\,Hz$$

c = light speed ; $x_e =$ Compton wavelength of the electron

Rydberg frequency for helium:

$$f_R = \frac{f_{OR}}{2} = 6.25\times10^{15}$$

The electron has a double orbit like in hydrogen

$$\frac{1}{\lambda_R} = \frac{f_R}{c} = 2.1\times10^{7}$$

One spectral wavelength:

$$\frac{1}{\lambda} = 2.1\times10^{7}\left(\frac{1}{3^2} - \frac{1}{8^2}\right) \quad ; \qquad \lambda = 498.7\times10^{-9}\,m$$

Experimental value:

$$\lambda = 501.5nm$$

Electron radius:

1º --- $R_1 = \dfrac{N_1 x_e}{2\pi} = 2.1\times10^{-11}\,m$

2º --- $R_2 = 3.8\times10^{-11}\,m$

The two electrons are not in the same orbit.

$$R = \frac{R_B}{Z_{ef}} \ ; \qquad R_B = \text{ Bohr radius}$$

Lithium

$$\frac{dE}{dN} = f(N)(N^3 - (N_1 + N_2 + N_3)N^2 + (N_1N_2 + N_1N_3 + N_2N_3)N - N_1N_2N_3) = 0$$

$$-f(N)(N_1 + N_2 + N_3)N^2 = \frac{m_e c^2}{N^3} \qquad \Leftrightarrow$$

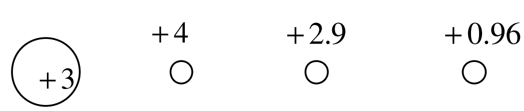
$$E_1 = -1.96\times10^{-17}\,J\ ; \quad E_2 = -1.21\times10^{-17}\,J\ ; \quad E_3 = -8.64\times10^{-19}\,J$$

$$\begin{cases} -2.4\times10^{-4} = \dfrac{6N_1{}^2 - 2N_1N_2 - 2N_1N_3 + N_2N_3}{12N_1{}^3(N_1 + N_2 + N_3)} + C_1 \\ -1.48\times10^{-4} = \dfrac{6N_2{}^2 - 2N_1N_2 - 2N_2N_3 + N_1N_3}{12N_2{}^3(N_1 + N_2 + N_3)} + C_2 \\ -1.06\times10^{-5} = \dfrac{6N_3{}^2 - 2N_1N_3 - 2N_2N_3 + N_1N_2}{12N_3{}^3(N_1 + N_2 + N_3)} + C_3 \end{cases}$$

$$C_1 = 0\ ; \quad C_2 = \frac{+3}{2\times137^2}\ ; \qquad C_3 = \frac{-3}{2\times137^2}$$

$$N_1 = 48\ ; \quad N_2 = 34.4\ ; \quad N_3 = -143.1$$

Effective charge:



The inner electron has lower energy than the second one.