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# Unified Absolute Relativity Theory E (I)

António José Saraiva - 2006-07-08
ajps2@hotmail.com

**Introduction** – Everything is relative, including light speed.

From a particular mathematical property of the Lorentz's equations we derive a theory that agrees with all known experimental data and works for atomic and sub-atomic scales, as quantum mechanics, but it also works for gravity at macroscopic scales.

## Basis of the absolute relativity theory

From the Lorentz's equations:

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

( This is only one solution. There are many others that can be explored.)

For $n$ relative frames with $v_n$ relative speeds:

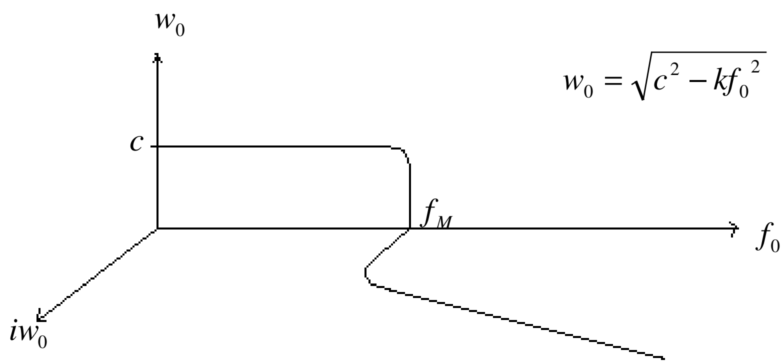
$$c^2{t_n}^2 - {x_n}^2 = k \quad \text{( constant )}$$

According to Einstein $k = 0$, so $x = ct$ and the light speed must be a constant.
But, and if $k$ is a positive small value? Let's explore this hypothesis.

In the arbitrary rest frame: $c^2{t_0}^2 - {x_0}^2 = k$

$t_0$ is the period of the wave; $x_0$ is the wavelength; $f_0 = 1/t_0$ is the frequency;
$w_0 = x_0/t_0$ is the wave speed; $c$ is the classical light speed = $2.99792458 \times 10^8$
( All the values, in this paper, are in S.I. units )

## Speed of the electromagnetic waves

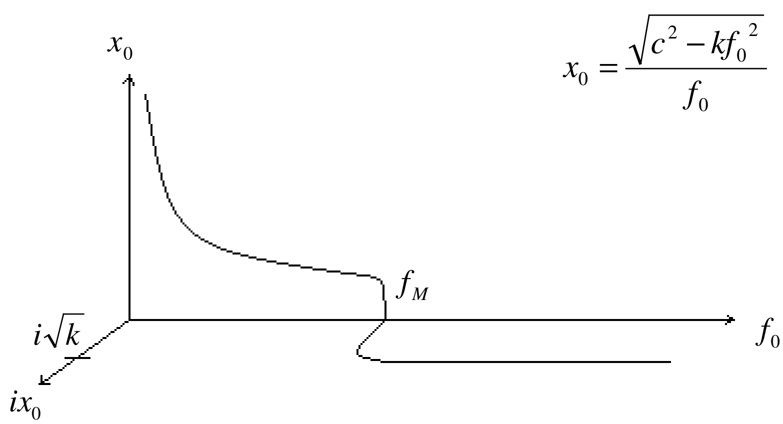



$$w_0 = \sqrt{c^2 - kf_0^{\,2}}$$

Example: For visible light $f_0 = 5\times10^{14}\,Hz$ if $k = 4\times10^{-27}\,m^2$

$$w_0 = 2.99792458\times10^8\,ms^{-1}$$

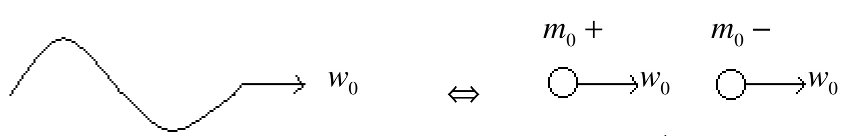
## Wavelength




$$x_0 = \frac{\sqrt{c^2 - kf_0^{\,2}}}{f_0}$$

## Energy of a rest particle

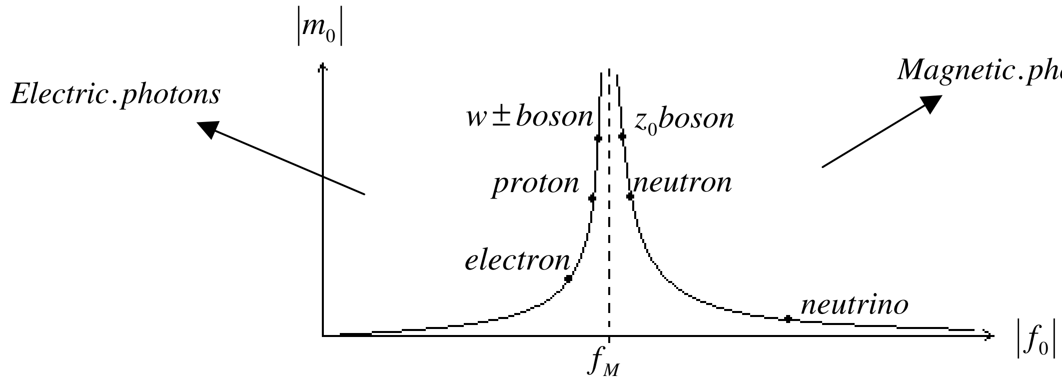
Wave-particle equivalence:




$E_0 = hf_0$ $\qquad$ $E_0 = 2\times\frac{1}{2}m_0 w_0^{\,2}$

$$E_0 = m_0 w_0^{\,2} = hf_0 \qquad \Leftrightarrow$$

$\Leftrightarrow$ Mass of a wave-particle: $m_0 = \dfrac{hf_0}{c^2 - kf_0^{\,2}}$

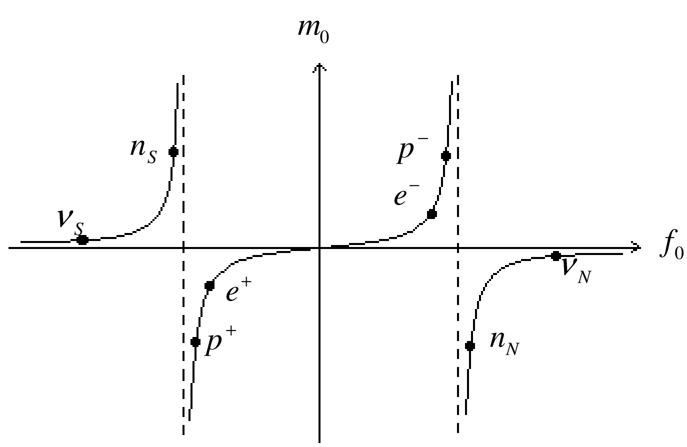



The explanation of the sub-atomic increasing mass is evident.

The macroscopic mass has a particular frequency $f_M = c/\sqrt{k}$. This gamma radiation frequency limit $f_M$ is approximately the frequency of the maximum limit of the average nucleon binding energy for $^{62}Ni$ -- $E_B = 8.8MeV$ ⇔ $f_0 \approx f_M \approx 2.1\times10^{21} Hz$, so $k \approx 2\times10^{-26} m^2$.

There are positive and negative masses.

**General wave-particle symmetry**




In the figure we can see the electron, the proton, the neutron, the neutrino and their anti-particles. The bosons make also part of this description and all existing wave-particles.

The sum of all that exists is equal to zero.

**Some formulas of the particles**

$$m_0 w_0^{\ 2} = hf_0 \qquad \text{and} \qquad c^2 t_0^{\ 2} - x_0^{\ 2} = k \qquad \Leftrightarrow$$

Electric photons:

$$f_0 = \frac{-h + \sqrt{h^2 + 4km_0^{\ 2}c^2}}{2m_0 k} \quad ; \quad x_0^{\ 2} = h\frac{h + \sqrt{h^2 + 4km_0^{\ 2}c^2}}{2m_0^{\ 2}c^2} \quad ; \quad w_0 = x_0 f_0$$

Magnetic photons:

$$f_0 = \frac{h + \sqrt{h^2 + 4km_0^{\ 2}c^2}}{2m_0 k} \quad ; \quad x_0^{\ 2} = h\frac{h - \sqrt{h^2 + 4km_0^{\ 2}c^2}}{2m_0^{\ 2}c^2} \quad ; \quad w_0 = x_0 f_0$$

Planck's constant $h = 6.62607554 \times 10^{-34}$

**Unified force**

All forces must have a unique mechanism and a unique formula.

As the speed of the electromagnetic waves is variable we can suppose that around a particle exists a field of speed variation or acceleration:

$$w = \sqrt{c^2 - k/t^2}$$

Acceleration: $$g = \frac{dw}{dt} \quad \Leftrightarrow \quad g = \frac{kf^3}{\sqrt{c^2 - kf^2}}$$

The force: $F = mg$ and $m = \dfrac{hf}{c^2 - kf^2}$ $\Leftrightarrow$

$$\Leftrightarrow \quad F = \frac{hkf^4}{\left(c^2 - kf^2\right)^{3/2}}$$

But between the local rest frame and the centre of our universe, there is the local expansion speed *v*.

From the time ( period ) Lorentz's equation:

$$f = \frac{cf_0\sqrt{c^2 - v^2}}{c^2 + vw_0} \quad \Leftrightarrow \quad F = \frac{kh(c^2 - v^2)^2 f_0^{\ 4}}{c^2(c^2 + vw_0)(w_0 + v)^3}$$

General formula for the unified force.

As we already know the values of the forces ( strong and electric ) we can calculate the values of *k* and *v*.

**Absolute values of the forces**

Coupling constants:

Electric force -- 1
Strong force -- 137.036
Weak force -- ???

Electric force between two electrons:

$$F_{\varepsilon e} = \frac{q_e^{\ 2}}{4\pi\varepsilon_0 \lambda_e^{\ 2}} \qquad \text{and} \qquad \lambda_e = \frac{h}{m_e c}$$

$$\varepsilon_0 = 8.854187817\times10^{-12}; \quad q_e = 1.6021773349\times10^{-19}; \quad m_e = 9.109389754\times10^{-31}$$

Electric unified force:

$$F_e = 1\times F_{\varepsilon e} \qquad \Leftrightarrow \qquad \underline{F_e = 3.91895053\times10^{-5}}$$

Apparent electric force between two protons:

$$F_{\varepsilon p} = \frac{q_e^{\ 2} m_p^{\ 2} c^2}{4\pi\varepsilon_0 h^2} \qquad \text{and} \qquad m_p = 1.67262311\times10^{-27}$$

Strong force: $F_p = 137.036\times F_{\varepsilon p} \quad \Leftrightarrow \quad \underline{F_p = 1.81059815\times10^4}$

$$\begin{cases} F_e = \dfrac{kh(c^2 - v^2)^2 f_{0e}^{\ 4}}{c^2(c^2 + vw_{0e})(w_{0e} + v)^3} \\ F_p = \dfrac{kh(c^2 - v^2)^2 f_{0p}^{\ 4}}{c^2(c^2 + vw_{0p})(w_{0p} + v)^3} \end{cases} \qquad \Leftrightarrow$$

One of the solutions is:

$$\Leftrightarrow \qquad \underline{k \approx 6.7\times10^{-27}\, m^2} \quad \text{and} \quad \underline{v \approx -1.6\times10^6\, ms^{-1}}$$

**Exact values of *k* and *v***

For the posterior calculation of the monopole we found the relation:

$$q_m q_e \approx h \qquad (\text{ Planck's constant })$$

$q_m$ - magnetic charge ; $q_e$ - electric charge

We assume that the exact formula is:

$$q_m q_e = h \quad \Leftrightarrow \quad q_m = 2\Phi_0$$

$\Phi_0$ - magnetic flux quantum ; $q_m = 4.13566925 \times 10^{-15} Weber$

The exact value of $v$ is: $\underline{v = -1.640834 \times 10^{6} ms^{-1}}$

For the posterior calculation of the magnetic moment of the electron we found that the gyro magnetic ratio $g_e$ is:

$\frac{g_e}{2} \approx \frac{c^2}{w_{0e}^{2}}$ and we assume that this relation must be exact:

$$g_e / 2 = c^2 / w_{0e}^{2} \quad \Leftrightarrow$$

$\Leftrightarrow$ the exact value of $k$ is: $k = 6.832685 \times 10^{-27} m^2$

**The monopole**

The unified force formula has a particular solution for a neutral particle that seems to be the monopole.

$w_0 = iV_0$ -- Neutral ( magnetic ) particle.

$$F = \frac{h(c^2 - v^2)^2 (c^2 + V_0^{2})^2}{kc^2 (c^2 + ivV_0)(v + iV_0)^3} \quad \Leftrightarrow$$

$$\Leftrightarrow \quad \begin{cases} c^2\left(c^2 + V_0^{2}\right)^2 = \left(c^4 + v^2 V_0^{2}\right)\left(v^2 - 3V_0^{2}\right)vFa \\ -v\left(c^2 + V_0^{2}\right)^2 = \left(c^4 + v^2 V_0^{2}\right)\left(3v^2 - V_0^{2}\right)Fa \end{cases} \quad \text{and} \quad a = \frac{c^2 k}{h\left(c^2 - v^2\right)^2}$$

$$\Leftrightarrow \quad V_0^{2} = \frac{3v^2c^2 + v^4}{3v^2 + c^2} \quad \Leftrightarrow \quad V_0 = 2.84189435 \times 10^{6} \;; \quad F = 2.21694502 \times 10^{7}$$

$a = 1.14741264 \times 10^{-10}$

$$m_0 = \frac{h\sqrt{c^2 + V_0^{\ 2}}}{\sqrt{k}.V_0^{\ 2}} \quad \Leftrightarrow \quad \underline{m_0 = 2.97567188 \times 10^{-25}}$$

The monopole can be the top quark.

$$x_0 = i\sqrt{k}\frac{V_0}{\sqrt{c^2 + V_0^{\ 2}}} \quad \Leftrightarrow \quad \underline{x_0 = i7.83544043 \times 10^{-16}}$$

If this particle is the monopole then the force between two monopoles is equal to:

$$F = \frac{1}{\mu_0}.\frac{q_m^{\ 2}}{x_0^{\ 2}} \quad ; \quad \mu_0 = 4\pi \times 10^{-7} \quad \Leftrightarrow$$

$\Leftrightarrow$ Magnetic charge -- $q_m = 4.13566925 \times 10^{-15} Weber$
( The same unit as magnetic flux )

It happens that: $q_m q_e = h$

The magnetic flux quantum: $\Phi_0 = \dfrac{h}{2q_e} \quad \Leftrightarrow \quad q_m = 2\Phi_0$

## The graviton

The force between two gravitons must be:

$$F = \frac{kh\left(c^2 - v^2\right)^2 f_0^{\ 4}}{c^2\left(c^2 + vw_0\right)\left(w_0 + v\right)^3} = G\frac{m_0^{\ 2}}{x_0^{\ 2}} \quad \Leftrightarrow$$

Gravitational constant -- $G = 6.6725985 \times 10^{-11}$

As $w_0$ is very small:

$$\Leftrightarrow \quad w_0^{\ 6} = \frac{Ghc^4 v^3}{k\left(c^2 - v^2\right)^2} \quad \Leftrightarrow \quad w_0 = i1.74862489 ms^{-1}$$

The imaginary value tells us that the graviton is a neutral particle.

$\Leftrightarrow$ $\underline{m_0 = 7.85937613 \times 10^{-13} kg}$ ; $f_0 \approx f_M$ -- matter frequency

$x_0 = i4.82138323 \times 10^{-22} m$

## Speed of the gravitational force *V*

$V = dx/dt \quad \Leftrightarrow \quad V = c^2 / w$

$$V = 5.14\times 10^{16}\, ms^{-1} \quad ; \quad V = 1.7\times 10^{8}\times c$$

**The neutrino**

As the speed of propagation of the field of the neutrino $w_0 = iV_0$ is very high, the force between two neutrinos is:

$$F_\nu = \frac{h.(c^2 - v^2)^2}{k.c^2 v} \quad \Leftrightarrow \quad F_\nu = 5.31148210\times 10^{3}$$

And the force between two neutrinos is:

$$F_\nu = \frac{khc(c^2 - v^2)^2}{(c\sqrt{k - l_0{}^2} + ivl_0)(v\sqrt{k - l_0{}^2} + icl_0)^3} \quad \text{and} \quad x_0 = il_0 \approx i\sqrt{k}$$

$$\sqrt{k - l_0{}^2} = n \quad ; \quad \alpha = khc(c^2 - v^2)^2 / F_\nu \quad \Leftrightarrow$$

$$\Leftrightarrow \quad \begin{cases} c(v^2n^2 + c^2k^2)^3 = \alpha.v(v^2n^2 - 3c^2k^2) \\ v(v^2n^2 + c^2k^2)^3 = -\alpha.c(3v^2n^2 - c^2k^2) \end{cases} \quad \Leftrightarrow$$

$$\Leftrightarrow \quad n^2 = \frac{c^2k^2(c^2 + 3v^2)}{v^2(v^2 + 3c^2)} \quad \Leftrightarrow \quad n = 7.20782401\times 10^{-25}$$

$$m_{0\nu} = \frac{hn}{ck} \quad \Leftrightarrow \quad \underline{m_{0\nu} = 2.33156998\times 10^{-40}\, kg} \quad \Leftrightarrow \quad \underline{m_{0\nu} = 1.3\times 10^{-4}\, eV}$$

$$f_{0\nu} = 4.1592644\times 10^{32} \quad ; \quad w_{0\nu} = i3.43805031\times 10^{19}$$

No one could explain the neutrino maintaining the light speed constant.

Why the squared variation of the mass of the neutrino, in all the experiments, came with a negative sign? It’s very simple:

**Relation between intrinsic mass $m_0$ and energy $E_0$**

For magnetic photons:

$$E_0 = -h\frac{h + \sqrt{h^2 + 4km_0{}^2c^2}}{2m_0k}$$

As the neutrino mass is very small:

$$E_{0\nu} = -\frac{h^2}{km_{0\nu}}$$

So, the value $\Delta m_{0\nu}{}^2$ is negative, because:

$$m_{0\nu}{}^2 = \frac{h^4}{k^2 E_{0\nu}{}^2} \qquad \Leftrightarrow \qquad \underline{\Delta m_{0\nu}{}^2 = -\frac{h^4}{k^2 E_{0\nu}{}^4} \Delta E_{0\nu}{}^2}$$

Contrary to the classical formula for the relation between mass and energy, in the true formula for the neutrino the mass is inversely proportional to the energy. So the variation comes negative.

This is the first and the only theory that explains this experimental fact.

**List of particles**

$k = 6.832685 \times 10^{-27}$ $\qquad$ $v = -1.640834 \times 10^{6}$

| **Particle** | **Mass** | **Frequency** | **Wavelength** | **Speed** |
|---|---|---|---|---|
| Electron | $9.109389754 \times 10^{-31}$ | $1.23415902 \times 10^{20}$ | $2.42771660 \times 10^{-12}$ | $2.99618834 \times 10^{8}$ |
| Neutrino | $2.33156998 \times 10^{-40}$ | $4.1592644 \times 10^{32}$ | $i\sqrt{k}$ | $i3.43805031 \times 10^{19}$ |
| Proton | $1.67262311 \times 10^{-27}$ | $3.59793841 \times 10^{21}$ | $1.04930380 \times 10^{-14}$ | $3.77533044 \times 10^{7}$ |
| Neutron | $1.67492861 \times 10^{-27}$ | $3.65587654 \times 10^{21}$ | $i1.04024175 \times 10^{-14}$ | $i3.80299541 \times 10^{7}$ |
| W boson | $1.43319 \times 10^{-25}$ | $3.62647335 \times 10^{21}$ | $1.12910430 \times 10^{-15}$ | $4.09466665 \times 10^{6}$ |
| Z boson | $1.625478 \times 10^{-25}$ | $3.62710997 \times 10^{21}$ | $i1.06012550 \times 10^{-15}$ | $i3.84519178 \times 10^{6}$ |
| Monopole | $2.97567188 \times 10^{-25}$ | $c/\sqrt{k}$ | $i7.83544043 \times 10^{-16}$ | $i2.84189435 \times 10^{6}$ |
| Top Qk | “ | “ | “ | “ |
| Graviton | $7.85937613 \times 10^{-13}$ | $c/\sqrt{k}$ | $i4.82138323 \times 10^{-22}$ | $i1.74862489$ |

**Magnetic moment of the particles**

It’s easy to prove that the gyro magnetic ratios of the electron and the muon are equal to the relation between the classic theory and ours.

**Correct vacuum permittivity and electric charge**

$$c^2 = \frac{1}{\varepsilon_0 \mu_0} \quad \text{and} \quad w_{0e}^{\ 2} = \frac{1}{\varepsilon_{0NEW} \mu_0} \quad \Leftrightarrow$$

$$\Leftrightarrow \quad \varepsilon_{0NEW} = \frac{\varepsilon_0 c^2}{w_{0e}^{\ 2}}$$

Electric force: $$F_\varepsilon = \frac{q_e^{\ 2}}{4\pi\varepsilon_0 \lambda_e^{\ 2}} = \frac{q_{eNEW}^{\ 2}}{4\pi\varepsilon_{0NEW} x_{0e}^{\ 2}} \quad \Leftrightarrow$$

$$\Leftrightarrow \quad q_{eNEW} = q_e \frac{c^2}{w_{0e}^{\ 2}}$$ ( Correction of the unitary charge )

**Electron magnetic moment**

$$\mu_e = \frac{q_{eNEW} h}{4\pi . m_{0e}} = \frac{q_e h}{4\pi . m_{0e}} \frac{c^2}{w_{0e}^{\ 2}} \quad \Leftrightarrow \quad \mu_e = 9.28476689 \times 10^{-24}$$

Experimental magnetic moment: $\mu_e = 9.284770131 \times 10^{-24}$

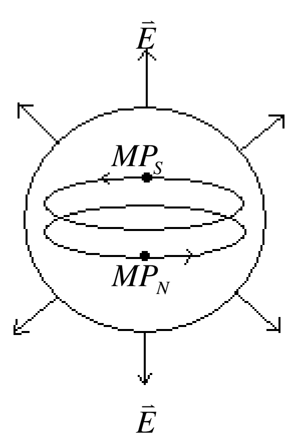
**Muon magnetic moment**

$$\mu_\mu = \frac{q_e h}{4\pi . m_{0\mu}} \frac{c^2}{w_{0e}^{\ 2}} \quad \Leftrightarrow \quad \mu_\mu = 4.49042212 \times 10^{-26}$$

Experimental value: $\mu_\mu = 4.490451415 \times 10^{-26}$

So, the correction between the old and the new theories works well to the electron and the muon.

We think that the electron is composed of two symmetric monopoles:



The proton and the neutral particles must have a different internal structure so they must have different formulas. For the proton we found one formula but we don't now it meaning:

$$\mu_p = \frac{q_e h c^2}{4\pi {w_{0e}}^2 m_{0p}} \sqrt{\frac{x_p}{\lambda_p}} \qquad \text{and} \qquad \lambda_p = \frac{h}{m_{0p} c}$$

**Coupling constant of the weak force**

The weak force is the strongest one.

$$\alpha_w^{-1} = \frac{F_w}{F_{\varepsilon w}} \qquad \text{and} \qquad F_w = \frac{kh(c^2 - v^2)^2 {f_0}^4}{c^2(c^2 + v w_0)(w_0 + v)^3}$$

$$F_{\varepsilon w} = \frac{{q_e}^2}{4\pi\varepsilon_0 {\lambda_w}^2} \qquad \text{and} \qquad \lambda_w = \frac{h}{m_{0w} c}$$

$$F_{\varepsilon w} = 9.70060346 \times 10^5 \quad ; \quad F_w = 5.29977422 \times 10^7 \quad \Leftrightarrow$$

$$\alpha_w^{-1} = 54.6334487$$

**Units unification**

In the nature we can percept directly the distance or the length of any object ( not space – we don't know what space is ). We can, also, percept directly the speed of variation of any quantity including the length.

The time is always given by indirect means, usually what we see changing is an angular distance or position, or the polarity of an electromagnetic oscillation.

When we measure the time we just compare the variation of a certain quantity, with it own speed, with the variation of the reference quantity at it reference speed:

Reference time - $\quad T = \frac{nL_R}{V_R}$

For the uniformly accelerated motion:

$$L = \frac{1}{2} a T^2 \quad \Leftrightarrow \quad L = \frac{1}{2} a \frac{n^2 {L_R}^2}{{V_R}^2}$$

So, $T = \frac{L}{V}$ ; L = length ; V = velocity

Time is a very useful unit in physics, but it doesn't exist in the nature. It is a mathematical entity.

Let's postulate: everything that exists is made of length and speed.

Thus, we must solve two problems, the unification of the electromagnetic units and the definition of the mass.

## Electromagnetic units unification

There is an evident equivalence between electromagnetism and fluid mechanics. We are trying to find the meaning of a fluid outflow in electromagnetism. Our theory states that the unitary magnetic charge $q_m$ is equal to:

$$q_m = 2\Phi_0 = \frac{h}{q_e} \quad \Leftrightarrow \quad q_m = 4.13115768 \times 10^{-15} \text{ Weber}$$

$q_e$ - unitary charge ; $h$ - Planck's constant ; $\Phi_0$ - magnetic flux quantum

So, magnetic charge has the same units as magnetic flux.

Outflow units: $Z = L^2 V$

Using the wavelength and the speed of the electron:

$$Z = x_{0e}{}^2 w_{0e} = 1.765452 \times 10^{-15} \quad \Leftrightarrow \quad q_m = 2.34 \times x_{0e}{}^2 w_{0e}$$

So, we assume the hypothesis that the magnetic charge has the units:

$$q_m = L^2 V$$

The magnetic force: $F_m = \frac{q_m{}^2}{\mu_0 L^2} \quad \Leftrightarrow \quad \mu_0 = M^{-1} L^3$

Classical light speed: $c^2 = \frac{1}{\varepsilon_0 \mu_0} \quad \Leftrightarrow \quad \varepsilon_0 = L$

Electric force: $F_e = \frac{q_e{}^2}{4\pi\varepsilon_0 L^2} \quad \Leftrightarrow \quad q_e = \sqrt{M} L V$

Planck's constant $h = q_e q_m \quad \Leftrightarrow \quad h = \sqrt{M} L^3 V^2$

## Definition of mass

Again, for the electron, we have found:

$$m_e \approx {x_{0e}}^4 {w_{0e}}^2 \qquad \Leftrightarrow \qquad m_e = \frac{{x_{0e}}^4 {w_{0e}}^2}{3.42}$$

So, we use the hypothesis that the mass units are:

$$M = L^4 V^2 \qquad \text{so,}$$

$$q_m = L^2 V \quad ; \quad \mu_0 = L^{-1} V^{-2} \quad ; \quad \varepsilon_0 = L \quad ; \quad h = L^5 V^3$$

## List of the unified units

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

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

Magnetic charge and flux = $q_m = \Phi = L^2 V = outflow$ ; $q_m = \sqrt{M}$

Electric charge = $q_e = L^3 V^2$

Inverse permeability = $1/\mu_0 = LV^2$ = density = electric potential

Magnetic field = $\vec{B} = V$

Electric field = $\vec{E} = V^2$

Electric current = $I = L^2 V^3$

Permittivity = $\varepsilon_0 = L$

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

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

Inverse resistance = $1/\Omega = LV$

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

Farad = $L^2$

Henry = $V^{-2}$

Energy = $L^4 V^4$

Moment = $L^4 V^3$

Watt = $L^3 V^5$

Magnetic flux density = $H = LV^3$

Magnetic potential = $LV$ = conductance ( inverse resistance )

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

Acceleration = $L^{-1} V^2$

………………….

As time doesn't exist it's impossible to travel in time.
Nature has no paradoxes.

What is mass? The mass is an electric dipole moment.

$$M = q_e \times L$$

**Electron electric dipole moment**

According to our hypothesis of the units unification the electric dipole moment it's just the mass of the particle:

$$d_e = n.q_e x_{0e} \quad \text{and} \quad n = \frac{q_m}{x_{0e}{}^2 w_{0e}} \quad \Leftrightarrow$$

$$\Leftrightarrow \quad \underline{d_e = m_{0e} = 9.109389754 \times 10^{-31}\, kg}$$

( The CGS units system fails for units unification )

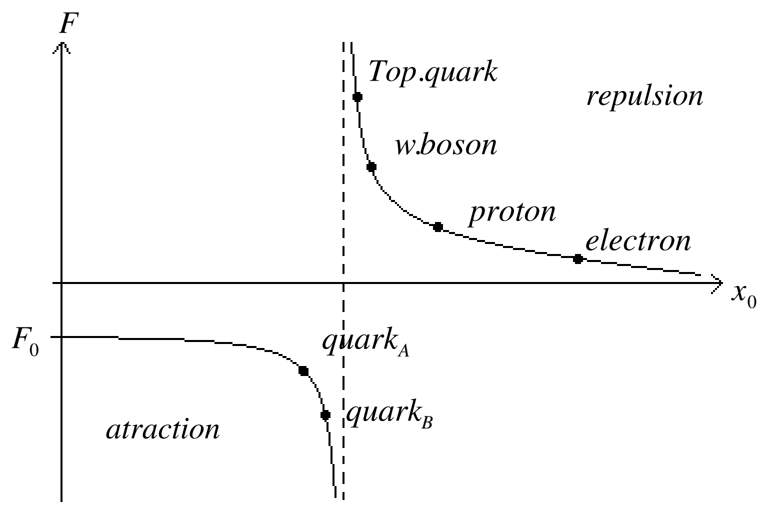
**The apparent different forces**

Force between two electrical equal particles:

$$F = \frac{kh(c^2 - v^2)^2 f_0{}^4}{c^2(c^2 + vw_0)(w_0 + v)^3} \quad \text{or} \quad F = \frac{khc(c^2 - v^2)^2}{\left(c\sqrt{k + x_0{}^2} + vx_0\right)\left(cx_0 + v\sqrt{k + x_0{}^2}\right)^3}$$

Confinement limit: $x_{0conf} = \frac{|v|\sqrt{k}}{\sqrt{c^2 - v^2}} \Leftrightarrow x_{0conf} = 4.5244535 \times 10^{-16}$

$$\Leftrightarrow \quad m_{0conf} = 8.92576787 \times 10^{-25}\, kg \quad (\approx 500 GeV)$$




$$F_0 = \frac{h(c^2 - v^2)^2}{kv^3} \Leftrightarrow F_0 = -1.77307798 \times 10^8\, N$$

Force between two equal neutral particles:

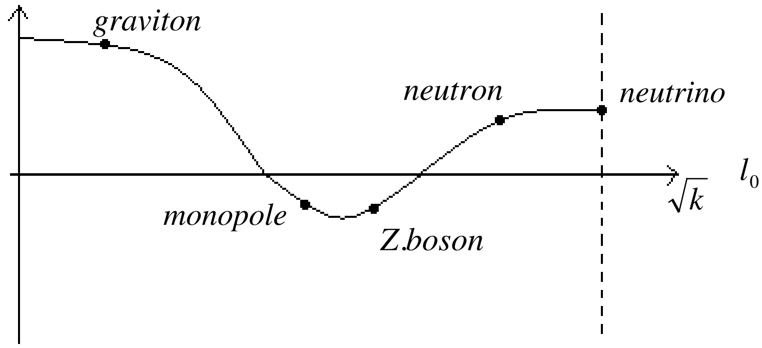
$$x_0 = il_0 \quad ; \quad l_0 \in \left[0, \sqrt{k}\right]$$

$$F = \frac{khc(c^2 - v^2)^2}{(c^2(k - l_0{}^2) + v^2 l_0{}^2)(v^2(k - l_0{}^2) + c^2 l_0{}^2)^3} \times$$

$$\times \left[ cv\left(v^2k^2 - kl_0{}^2\left(3c^2 + 5v^2\right) + 4l_0{}^4\left(c^2 + v^2\right)\right) - il_0\sqrt{k - l_0{}^2}\left(v^4k - c^2v^2k - l_0{}^2\left(c^2 - v^2\right)^2\right)\right]$$

The value of the force is the module of $F$ and the signal is the signal of the real part.
The neutral force has no confinement.

$F$




Force between two complementary particles:

( electron-neutrino; proton-neutron; *W* and *Z* bosons )

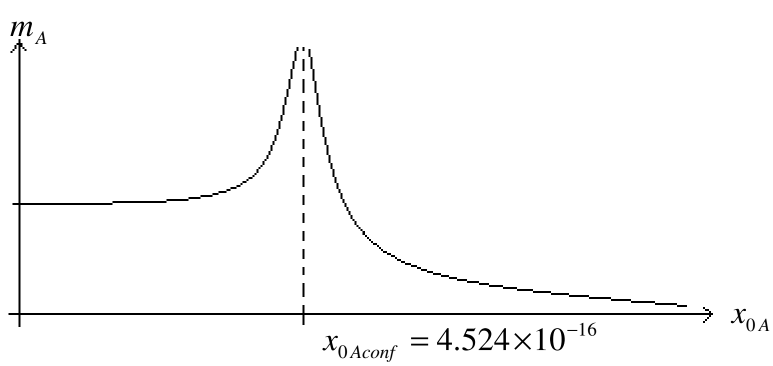
$$F_{AB} = m_A g_B \quad ; \quad m_A = \frac{hf_A}{c^2 - kf_A^{\ 2}} \quad \text{and} \quad f_A = \frac{cf_{0A}\sqrt{c^2 - v^2}}{c^2 + vw_{0A}}$$

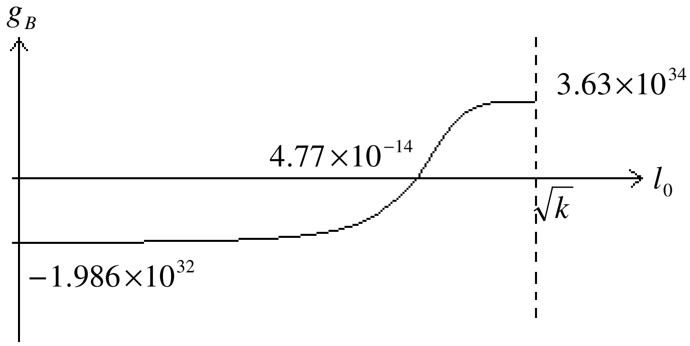
$$g_B = \frac{kf_B^{\ 3}}{\sqrt{c^2 - kf_B^{\ 2}}} \quad \text{and} \quad f_B = \frac{cf_{0B}\sqrt{c^2 - v^2}}{c^2 + vw_{0B}} \quad \Leftrightarrow$$

$$\Leftrightarrow \quad m_A = \frac{h\sqrt{c^2 - v^2}\left(c\sqrt{k + x_{0A}^{\ 2}} + vx_{0A}\right)}{c\left(cx_{0A} + v\sqrt{k + x_{0A}^{\ 2}}\right)^2} \quad \text{and}$$

$$g_B = \frac{kc^2(c^2 - v^2)^{3/2}}{\left(v^2\left(k - l_{0B}^{\ 2}\right) + c^2 l_{0B}^{\ 2}\right)\left(c^2\left(k - l_{0B}^{\ 2}\right) + v^2 l_{0B}^{\ 2}\right)^2} \times$$

$$\times \left\{v\sqrt{k - l_{0B}^{\ 2}}\left[c^2 k - l_{0B}^{\ 2}\left(3c^2 + v^2\right)\right] - icl_{0B}\left[k\left(c^2 + 2v^2\right) - l_{0B}^{\ 2}\left(c^2 + 3v^2\right)\right]\right\}$$






**The three components of the nuclear force**

Force between two protons - $F_{PP} = +1.61199803\times10^{4}$

Force between two neutrons - $F_{NN} = +1.47684305\times10^{4}$

Force proton-neutron - $F_{PN} = -1.60225595\times10^{4}$

Quarks are not needed to explain the nuclear force.

**Electron-neutrino force**

$$\left|F_{e\nu}\right| = \pm3.32436549\times10^{4}$$

We think that the "isolated" electron is always bounded to a neutrino, with a force strongest then the nuclear force.

**Some macroscopic absolute relativity effects**

**Light deflection by the sun**

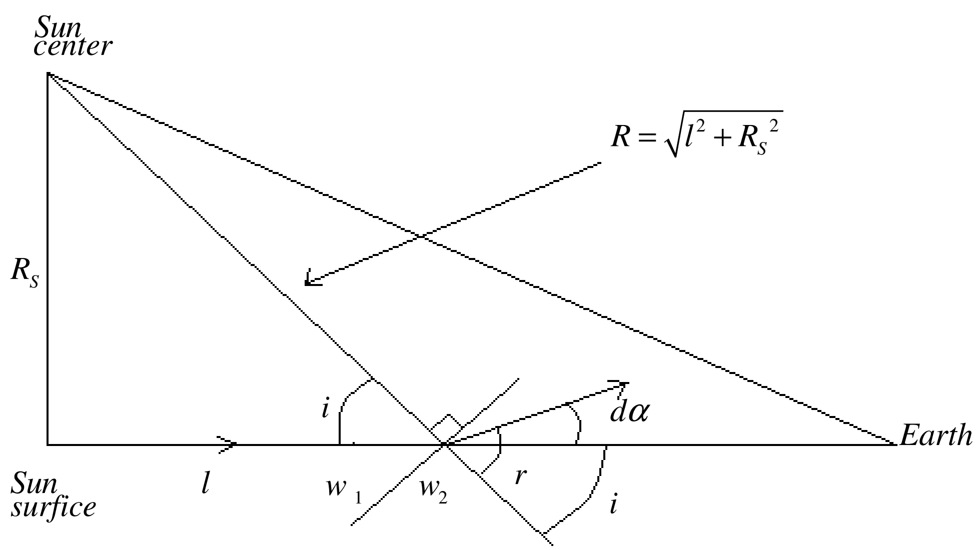
As the space contraction and time dilatation formulas are note equal we conclude that light speed is variable, so we demonstrate that the values of one test of general relativity can be calculated if we consider that the light speed in gravitational fields behaves as in the optical mediums.

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:

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

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

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

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

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

If we want to put gravity in the relativity equations we must change the linear velocity $v$ by the escape speed or the speed of free fall from the infinite 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:

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

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

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

Thus, we have calculated the correct deviation and derived the Einstein formula.

## 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.

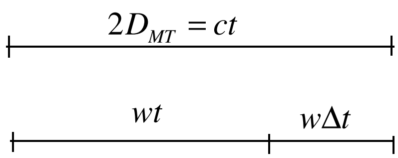
The signal passes near the Sun's surface and due to the space-time bending it suffers a delay.

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

$D_{MS} = 2.279\times10^{11}$ **--** Mars Sun distance; $D_{TS} = 1.5\times10^{11}$ --Earth Sun distance;

$D_{MT} = 3.779\times10^{11}$ --Mars Earth distance; $M_S = 1.989\times10^{30}$ -- Sun's mass

$R_S = 6.95\times10^{8}$ -- Sun's radius.




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

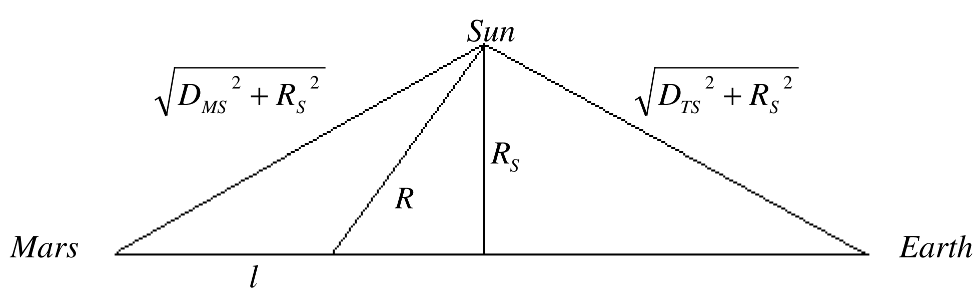
$\Delta t =$ time delay ; $w =$ slower light speed

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

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

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

Local escape speed: $v_i^2 = \dfrac{2GM_S}{R}$ and




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

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

Average *v*:

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

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

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

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

The experimental value of $\Delta t$ 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.

As we demonstrate the two perspectives are equivalent.

## Correction of the gravitational force

From the formulas of the space contraction and time dilatation:

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

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

The wave energy is given:

$$E = mw^2 \qquad \text{and} \qquad E = hf \qquad \Leftrightarrow \qquad mw^2 = hf \qquad \Leftrightarrow$$

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

$$\text{As} \qquad f = f_0\sqrt{1 - v^2/c^2} \qquad \Leftrightarrow \qquad m = \frac{m_0}{\left(1 - v^2/c^2\right)^{3/2}}$$

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:

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

$$\text{Thus,} \qquad \Delta m = m - m_0 = \frac{m_0}{\left(1 - v^2/c^2\right)^{3/2}} - m_0 \qquad \Leftrightarrow \qquad \Delta m \approx m_0 \frac{3v^2}{2c^2}$$

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

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

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

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

**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

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

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 ; $\varepsilon$ = orbit eccentricity

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

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

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

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

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

$\delta=5.01317\times10^{-7}$ 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 correct value of the Mercury's precession.