Metrical Analysis in Cosmology by a Unified Theory with a Model
(Total Version)

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Electromagnetic interaction of gravity. Proposal for unified field theory.

ABSTRACT

From this theory arises an equation connects Planck's constant (h), the speed of light (c), the constant of (G), the constant of (K_e=1/4π.ε_o) and Boltzmann's constant (k_{bl}). The important aspect in this equation is that it arrives at a function with a geometrical content in 10 dimensions of space: forces are added logarithmically. From the following proposals of the theory, we obtain applications with temperatures comparable to the and masses like the Planck mass and the inclusion of the Avogadro number and mass of proton .

INTRODUCTION

From this theory arises an equation connects Planck's constant (h), the speed of light (c), the constant of (G), the constant of (K_e=1/4.π.ε_o) and Boltzmann's constant (k_{bl}). The important aspect in this equation is that it arrives at a function with a geometrical content in 10 dimensions of space: forces are added logarithmically. From the following proposals of the theory, we obtain applications with temperatures comparable to the and masses like the Planck mass and the inclusion of the Avogadro number and mass of proton .
The resulting mathematical solution is not the solution that can determine the relationship of the forces contained in the equation in its full depth. However, it is valuable as a manner for a solution.

MAIN ARTICLE
HYPOTHESES

1. In some point of the space, electromagnetic oscillations LC are taking place. This space is traversed by a current (i), and is equivalent to condenser (C).This ypothesis is not oblicated but a way for transformations of ypothesis 4 .

2. There is a mass (m) that performs an oscillation and is proportional to some electric
charge (Q): Q=k.m.
In order for the mass to be positive (m>0), the constant k must have the same sign (+ or -) as the electric charge

3. We may consider that there is a mass (m) that performs a harmonic oscillation with period $T=\theta_O.2\pi.(\lambda/g)^{1/2}$,
and frequency f =1/T, g: acceleration of gravity.

4. The harmonic oscillation has an oscillation constant (τ), which is proportional with the density of the electric charge and mass:
$\tau = k.t$, $t = K_e.m.\rho_c$. These teansformations are oblicated for this theory .
The energy of the oscillation is proportional to the square of the amplitude
$(E = (1/2).\tau.\chi^2)$, $\chi = l_c$, $\lambda=2\pi.l_c$
The acceleration of the electric charge due to the Coulomb force is equal to the acceleration of the oscillation:
$g_c=g_X$ and the density of the electric charge (ρ) is : $\rho_c=Q/l_c^3$.

5. In that area the gravity and the electric power are equalized at the length
$l_g = (2\pi)^{1/2}.l_c$ or $l_g = l_c$ and $m_c= Q/k =m_g$, π = 3,14…, m_g: gravitational mass,
$\theta_c.K_e.\ k^2.m_c^2/\ l_c^2= \theta_g.G.\ m_g^2/\ l_g^2$, $\theta_c = \theta_g =1$, θ_c, θ_g : constants of both interactions .

6. The quantum mechanics laws are in force : $E_{\lambda c}= n_1.N.h.c/\ n_2.\lambda = E.k.m.\ l_c$,
with wavelength $n_2.\lambda$ and *E*: the intensity of the electric field.
with n_1:energy level, n_2: number of waves. It should be valid that the electric energy is equal to the electromagnetic energy
$E_c=E_{\lambda c}$, and that oscillation consists of an integer number of fundamental waves λ. The density of the electric charge (ρ) is proportional to the acceleration (g), as an expansion of the Poisson's equation: $\rho_c=a.g_c$, $g_c=k.\ E$, *E*: the intensity of the electric field.

7. Thermal power can be equivalent to electromagnetic with wavelength lx :
$E_{lx}= E_T$, $E_{lx}= n_1.N.k_{bl}.T=n_2.h.c/lx$, , n_1: degrees of freedom, n_2: energy level,
N: number of particles, T: temperature .

The degrees of freedom of the thermal movement are equal to the quantum number of the $E_{\lambda c}$ oscillation (of that, that is equal to the electric oscillation) and the number of the waves of $E_{\lambda c}$ is equal to the quantum number of the E_{lx} oscillation that is equal to the thermal movement.

The above relations between lengths were taken in order to be in accordance with the Planck mass in the applications of mass with the Planck temperature.
The hypotheses

a) $\theta_O = 1/2\pi$, $\theta_c = \theta_g = 1$ or
b) $\theta_O = 1$, $\theta_c = \theta_g = 1$

(1)

These are wo solutions **simply** to agree with M_{Planck}, T_{Planck} (Planck mass and Planck temperature) for
$n_1=10$, $n_2=12$ and mass of proton .

symbols

frequency (f)
condenser capacity (C)
electric potential (U_e)
potential (U_m)
electric charge (Q)
length (l)
acceleration (g)
speed of light (c)
self-induction coefficient (L)
energy (E)
force (F)
intensity of current (i)

HYPOTHESIS 1

$E = (1/2).L.i^2 \Rightarrow$ (2)
$E = (1/2).L.(Q/\delta t)^2 \Rightarrow$ (3)
$U_e.\, Q = (1/2).L.(Q/\delta t)^2 \Rightarrow$ (4)
$L = 2.U_e.\, \delta t^2 / Q$, δt = time (5)

HYPOTHESIS 2

If $Q = k.m$, let be k a constant and m the mass
From Einstein's theory $U_m = c^2$ or in low speed $v^2/2$ so

$U_m = E/m = E/(Q/k) = (E/Q).k = U_e.k \Rightarrow$ (6)
$U_e = U_m/k$ (7)
$U_e = c^2/k$ So (1) $\Rightarrow$ (8)
$L = 2.(c^2/k).(l/c)^2/Q = 2.c^2 .\, l^2/k.c^2 .Q$ (9)
$\Rightarrow$ $L = 2.l^2/k.Q$ (10)
l = length of current (l_i)

HYPOTHESIS 3

$T = \theta_O.\ 2\pi.(\lambda/g)^{1/2}$, if $\lambda = l_i \Rightarrow$ (11)
$f = 1/(2\pi.(L.C)^{1/2}) = 1/(\ 2\pi.\theta_O(l/g)^{1/2}) \Rightarrow$ (12)
$2\pi.(L.C)^{1/2} = 2\pi.\theta_O(\lambda/g)^{1/2} \Rightarrow$ (13)

$4\pi^2.L.C = 4\pi^2.\theta_O{}^2.\lambda/g$, (3) $\Rightarrow$ (14)
$(2.\lambda^2\ /k.Q).\ 4.\pi^2.C = 4\pi^2.\theta_O{}^2.\lambda/g \Rightarrow$ (15)
$C = 4\pi^2.\theta_O{}^2.k.Q/8\pi^2.g.\lambda$ (16)

λ= wavelength = length of current**,** This must be set with the introduction of the equation (3)

HYPOTHESIS 4

Energy is $E = (1/2).C.\ U_e{}^2$,(2) $\Rightarrow$
(17)
$E = (1/2).C.(\ U_m/k)^2 = (1/2).C.U_m{}^2/k^2 =$
(18)
$= (1/2).C.(g.\chi)^2/\ k^2 = (1/2).\ (C.g^2/\ k^2).\chi^2$,
(19)
$\Rightarrow\quad E = (1/2).\tau.\chi^2$, $\boldsymbol{\tau = C.g_\chi{}^2/\ k^2}$,
(20)
χ = amplitude length**,** We accept this with the energy forms: $(\tau.\chi^2, g_\chi)$.

a) Law of Coulomb and Newton :
$mg_c = K_e.\ Q^2/\ l_c{}^2$, $K_e = 1/4\pi.\varepsilon_o \Rightarrow$ (21)
$mg_c = K_e.\ k.m.Q/\ l_c{}^2 \Rightarrow\ \ g_c = k.K_e.Q/\ l_c{}^2$ (22)

if $g_c = g_\chi \Rightarrow\quad \tau = C.g_\chi{}^2/\ k^2 =$ (23)
$C.(\ k.K_e.Q/\ l_c{}^2)^2/\ k^2 = C.K_e{}^2Q.Q/\ l_c{}^4$ (24)
$= C.K_e{}^2Q.Q/\ l_c.\ l_c{}^3$, (25)
If $\rho_c = Q/\ l_c{}^3$ then $\tau = C.K_e{}^2Q.\ \rho_c\ /\ l_c \Rightarrow$ (26)
$K_{el} = 1/4\pi.\varepsilon_o$, (27)
$\tau = C.K_e{}^2.k.m.\ \rho_c\ /\ l_c$ (28)

b) The above relation can come up by the use of interactions of the energy E and the density of the electric charge.

$(E/l) = \theta.\rho_m.l_c{}^3.g_c = \theta.K_e.Q.\rho_c.l_c$ (29)
with $\rho_c = k.\rho_m$, (30)

θ: coefficient of shape that $\theta/V = l_c{}^{-3}$, V: volume and $g_c = k.E$, *E* : the intensity of the electric field.

MAIN TRANSFORMATIONS

let be $\mathbf{t_c = K_e.m.\rho_c}$ then $\tau = k.(C.K_e/ l_c).t_c$ (31)
but $C.K_e/ l_c=1$ because (32)
$K_eQ^2/ l_c^2= U.Q/ l_c \Rightarrow$ (33)
$K_eQ/ l_c = U,\ Q = C.U \Rightarrow$ (34)
$C.K_e/ l_c =1$ So $\mathbf{\tau = k.\ t_c}$ **(35)**

Law of Coulomb $F= K_eQ^2/ l_c^2 = K_e(Q.Q/ l_c^3).\ l_c =$ (36)
$(K_e.k.m.\rho_c).\ l_c=k.\ t_c\ .\ l_c$ (37)
so $\tau = k.\ t_c$, this agree by (35)quation .

(28) $\tau = C.K_e^2.k.m.\ \rho_c\ /\ l_c,\ \ t = K_{el}.m.\ \rho_c$, (16) $\rho_{c\lambda}=Q/\ \lambda.l_c^2 \Rightarrow$ (38)
$\tau = (4\pi^2.\theta_O^2.k.Q/8\pi^2.g.\lambda).(K_e.k/\ l_c).\ t_c =$ (39)
$(4\pi^2.\theta_O^2.k^2.Q.K_e/8\pi^2.g.\lambda.l_c).\ t_c$ (40)
$= (4\pi^2.\theta_O^2.k^2.Q.K_e/8\pi^2.g.\lambda.l_c^2).\ l_c.\ t_c$ (41)

for $\mathbf{\lambda=2\pi.\ l_c}$: ypothesis 4 $\Rightarrow$ (42)
$\tau = (4\pi^2.\theta_O^2.k^2/16\pi^3.g).K_e.\rho_c.\ l_c.\ t_c\ =$ (43)
$(4\pi^2.\theta_O^2.k^2/16\pi^3.m.g).(K_e.m.\ \rho_c\ ).\ l_c.\ t_c =$ (44)
$(\theta_O^2.k^2/4\pi.F).\ l_c.t_c.t_c$, (45)
Let be $\mathbf{\beta = (\theta_O^2.k^2/4\pi.F).\ l_c}$ so $\mathbf{\tau =\beta.\ t_c^{\,2}}$ (46)
(35)(46)$\Rightarrow$ $\mathbf{k = \beta.t_c}$ **(47)**

In order to be m>0 it should be Q/k>0 so t_c/Q>0 and k/t_c>0 so (35) τ>0, (47) β>0.

1. $\mathbf{\tau = k.\ t_c}$
2. $\mathbf{t_c = K_e.m.\ \rho_c}$
3. $\mathbf{\beta = (\theta_O^2.k^2/4\pi.F).\ l_c}$
4. $\mathbf{\tau =\beta.\ t_c^{\,2}}$
5. $\mathbf{k =\beta.t_c}$

All the above mathematical analysis is to provide a way to extract the main transformations and is not oblicated .

HYPOTHESIS 5

Since the speed at which the interaction occurs is the speed of the light (hypothesis 2) there is no relative situations (54),(55)

1) Hypothesis 2, law of Coulomb $\Rightarrow$
$F = K_e.\ k^2.m_c^2/\ l_c^2$, for F gravity = F electricity
(48)
F gravity $= G.\ m_g^2/\ l_g^2 \Rightarrow$ (49)
$K_e.\ k^2.m_c^2/\ l_c^2= G.\ m_g^2/\ l_g^2$ (50)

Ypothesis 5.1.a) if **$m_c = m_g$, $l_g = (2\pi)^{1/2}.l_c \Rightarrow$** (51)

$K_e.\ k^2.\ m_c^2/l_c^2 = G.m_c^2/\ ((2\pi)^{1/2}.l_c)^2 \Rightarrow$ (52)

$2\pi.K_e.\ k^2.m_c^2 = G.\ m_c^2$ (53)

$$\mathbf{G = 2\pi.K_e.k^2} \qquad \mathbf{(54)}$$

Ypothesis 5.1.b) if $m_c = m_g$, $l_g = l_c \Rightarrow$ $G = K_e.k^2$ (55)

2) The above relation can arise by assuming the existence of the interactions of the energy E system
with mass density $\rho_g = m/l_g^3$, and charge density $\rho_c = Q/l_c^3$, so
$(E/l_g) = \theta.G.m_g.\rho_g.l_g = (E/l_c) = \theta.K_e.Q.\rho_c.l_c$, θ: coefficient of shape of the system,

$\theta/V = l^{-3}$, $l = l_c$ or l_g and $\rho_c = k.\rho_g$. (56)

(54),(47)$\Rightarrow$ $G = 2\pi.K_e.\beta^2.t_c^2$ (57)

(55),(47)$\Rightarrow$ $G = K_e.\beta^2.t_c^2$ (58)

HYPOTHESIS 6

5.1.a) $G = 2\pi.K_e.\beta^2.\ t_c^2$, $t = K_{el}.m.\ \rho_c \Rightarrow$ (59)

$G = 2\pi.K_e.\beta^2.(\ K_e.m.\ \rho_c\ )^2 \Rightarrow$ (60)

$G = 2\pi.K_e^3.m^2.\ \rho_c^2.\beta^2 \Rightarrow$ (61)

if $\rho_c = \alpha.g_c$, $g_c = k.E$, E : is the intensity of the electric field (this will modified at calculation of parameter α

$G = 2\pi.K_e^3.m^2.g_c^2.\alpha^2.\beta^2 \Rightarrow$ (62)

$G = 2\pi.K_e^3.(E_c^2/\ l_c^2).\alpha^2.\beta^2$, (63)

E_c : electricity energy since the origin of m is the parameter **t**, and arises of electricity : function (6)

$E_{\lambda c} = n_1.N.h.c/\ n_2.\lambda$, if $\mathbf{E_c = E_{\lambda c}} \Rightarrow$ (64)

$G = 2\pi.K_e^3.((\ n_1.N.h.c/\ n_2.\lambda)^2/\ l_c^2).\alpha^2.\beta^2 \Rightarrow$ (65)

$G = 2\pi.K_e^3.((n_1/n_2)^4.N^2.h^2.c^2/\lambda^2.l_c^2).\alpha^2.\beta^2$, if $lx^4 = \lambda^2.l_c^2 \Rightarrow$ (66)

$G = 2\pi.K_e^3.((n_1/n_2)^2.N^2.h^2.c^2/lx^4).\alpha^2.\beta^2 \Rightarrow$ (67)

$G = 2\pi.\ (n_1/n_2)^2.N^2.K_e^3.h^2.c^2.\alpha^2.\beta^2/lx^4$, $lx^2 = l_c.\lambda$ (68)

5.1.b) (55) $\Rightarrow$ $G = (n_1/n_2)^2.N^2.K_e^3.h^2.c^2.\alpha^2.\beta^2/lx^4$,
$lx^2 = l_c.\lambda$

The length of the electromagnetic oscillation that is equal to the thermal movement is equal to the length of the gravitational interaction.

HYPOTHESIS 7

5.1.a) $G = 2\pi.(n_1/n_2)^2.N^2.K_e^3.h^2.c^2.\alpha^2.\beta^2/lx^4$, (69)
let be k_{bl} Boltzmann's constant, $E_{lx} = E_T$,
$E_{lx} = n_1.N.k_{bl}.T = n_2.h.c/lx \Rightarrow$ (70)
$lx = (n_2/n_1).h.c/N.k_{bl}.T$ (71)

The n_2 expresses the number of the fundamental waves and $n_1$expresses the degrees of freedom of the thermal movement that are possessed by n_1 quantum of $E_{\lambda c}$.

So $\mathbf{G = 2\pi.(n_1/n_2)^2.N^2.K_e^3.h^2.c^2.\alpha^2.\beta^2/((n_2/n_1).h.c/N.k_{bl}.T)^4}$ and (72)

$G = 2\pi.(n_1/n_2)^2.N^6.K_e^3.k_{bl}^4.T^4.\alpha^2.\beta^2/(n_2/n_1)^4.h^2.c^2 \Rightarrow$ (73)
$2\pi.\alpha^2.\beta^2 = (h^2.c^2.G / K_e^3.k_{bl}^4).((n_1/n_2)^{-6}.N^{-6}/T^4)$, (74)
$K_e = 1/4\pi.\varepsilon_o = 8,9875.10^9.N.m^2/C^2$ (75)

$h^2.c^2.G / K_e^3.k_{bl}^4 = 99,6895$, $(99,68955)^{1/4} = 3,1598199$ without dimensions
let be $\mathbf{\pi^* = 3,1598199}$ without dimensions for the time being . (76)

So $\mathbf{h^2.c^2.G / K_e^3.k_{bl}^4 = \pi^{*4}}$ **and** $\mathbf{2\pi.\alpha^2.\beta^2 = (n_1/n_2)^{-6}.N^{-6}.\pi^{*4}/T^4}$ **(77)**

5.1.b) $\alpha^2.\beta^2 = (h^2.c^2.G / K_e^3.k_{bl}^4).((n_1/n_2)^{-6}.N^{-6}/T^4)$ (78)

CALCULATION OF THE PARAMETERS α, β, OF THE CONSTANT k AND THE VARIABLE T

a) $dE/\delta x = \rho_c/\varepsilon_0$ (Poisson function), dE is the differential of intensity of the electric field :

b) $dE = dF/dQ$, for $\delta x = l_c \Rightarrow$ (79)

$(dF/dQ)/l_c = \rho_c/\varepsilon_0$, hypothesis 2 : $dQ = k.dm \Rightarrow$ $\rho_c = (dF/k.dm.l_c).\varepsilon_0$

and the differential of acceleration $dg_c = dF/dm \Rightarrow$ (80)
$\rho_c = \varepsilon_0.g_c/k.l_c \Rightarrow \mathbf{\rho_c = \alpha_p.g_c}$: hypothesis 6 and $\mathbf{dg_c = k.dE}$ so

$$\mathbf{\alpha_p = \varepsilon_0/k.l_c} \quad (81)$$

c) From Coulomb's law : $F = \theta.K_e.Q.\rho_c.l$, $\theta/V = l^{-3}$ $\rho_c = \alpha_c.g_c \Rightarrow$ (82)

$\alpha_c = 4\pi.\varepsilon_0/\theta.k.l$, is accepted if $l.\theta = 4\pi.l_c$ so $\alpha_c = \varepsilon_0/k.l_c$ (83)

ex. $l = 3.l_c$, $\theta = (4/3).\pi \Rightarrow$ $\alpha_c = \varepsilon_0/k.l_c$ (84)

The equation $\alpha_p = \varepsilon_0/k.l_c$ is assumed to agree to the next one, so hypothesis 6 will be:

$$\boldsymbol{\rho_c = \alpha.g_c, \quad dg_c = k.dE, \quad E_c = E_{\lambda c}} \quad (85)$$

and concerns the differential of acceleration,
alteration of intensity of electric field and the differential of electrical energy .

Hypothesis5.1.a)

$2\pi.\alpha^2.\beta^2 = (n_1/n_2)^{-6}.N^{-6}.\pi^{*4}/ T^4 \Rightarrow$ (86)
$(2\pi)^{1/2}.\alpha.\beta = (n_1/n_2)^{-3}.N^{-3}.\pi^{*2}/ T^2 \Rightarrow$ (87)
$(2\pi)^{1/2}.\beta = (n_1/n_2)^{-3}.N^{-3}.\pi^{*2}/ \alpha.T^2$, (81) $\Rightarrow$ (88)
$(2\pi)^{1/2}.\beta = (n_1/n_2)^{-3}.N^{-3}.\pi^{*2}/(\varepsilon_0/k.l_c).T^2$, (89)

$\mathbf{a = a_p}$, in order to agree at temperature applications $\Rightarrow$ (90)
$(2\pi)^{1/2}.\beta = (n_1/n_2)^{-3}.N^{-3}.\pi^{*2}.k.\ l_c /\varepsilon_0.T^2$ (91)

(54) $\Rightarrow$ $k = (G/2\pi.K_{el})^{1/2}$, (47)$\Rightarrow$ (92)
$\beta = k/\ t_{c\lambda} = ((G/2\pi.K_{el})^{1/2})/\ t_{c\lambda}$, $t_{c\lambda} = K_e.m.\rho_{c\lambda} \Rightarrow$ (93)
$\beta^2 = G/2\pi.K_{el}\ (K_{el}.m.\ \rho_{c\lambda})^2$, $\rho_{c\lambda} = Q/\lambda.\ l_c^2 \Rightarrow$ (94)
$\beta^2 = G/\ 2\pi.K_e(K_e.m.Q/\lambda.l_c^2)^2 \Rightarrow$ (95)
$2\pi.\beta^2 = (G\ /\ K_e^3.m^2).(\lambda^2.l_c^4/\ Q^2)$ (96)

(91),(96)$\Rightarrow$ $2\pi.\beta^2 = ((n_1/n_2)^{-3}.N^{-3}.\pi^{*2}.k.\ l_c /\varepsilon_0.T^2)^2 =$
$(G\ /\ K_e^3.m^2).(\lambda^2.l_c^4/Q^2) \Rightarrow$ (97)
$N^{-6}.\pi^{*4}.k^2.\ l_c^2/\varepsilon_0^2.T^4 = (G\ /\ K_e^3.m^2).(\ \lambda^2.l_c^4/\ Q^2) \Rightarrow$ (98)
$T^4 = (n_1/n_2)^{-6}.N^{-6}.\pi^{*4}.K_e^3.(k^2.m^2).Q^2/\ \varepsilon_0^2.G\ .\ \lambda^2.l_c^2 =$
$(n_1/n_2)^{-6}.N^{-6}.\pi^{*4}.K_e^3.Q^4/\ \varepsilon_0^2.G\ .\ \lambda^2.l_c^2 \Rightarrow$ (99)
$T^4 = ((n_1/n_2)^{-6}.N^{-6}.\pi^{*4}.K_e^3/\ \varepsilon_0^2.G\ ).(\ Q^4/\ \lambda^2.l_c^2) \Rightarrow$ (100)
$T^4 = (n_1/n_2)^{-6}.N^{-6}.1{,}38585\times10^{64}.(\ Q\ /\lambda.l_c)^2$ and (101)
$\mathbf{T = (n_1/n_2)^{-3/2}.\ N^{-3/2}.1{,}085\times10^{16}.Q/\ (\lambda.l_c)^{1/2}\ ,\ \lambda = l_c\ \ ,\ a = a_p}$ **(102)**

(54) $\Rightarrow$ $\mathbf{k = (G/2\pi.K_e)^{1/2} = 3{,}43745\times10^{-11}\ C/Kg}$ **(103)**
(91) $\Rightarrow$ $\boldsymbol{\beta = (n_1/n_2)^{-3}.N^{-3}.\pi^{*2}.k.l_c/(2\pi)^{1/2}.\varepsilon_0.T^2,\ \ a = a_p,}$ (104)

Hypothesis 5.1.b)

$T = (n_1/n_2)^{-3/2}.\ N^{-3/2}.1{,}085\times10^{16}.Q/\ (\lambda.l_c)^{1/2}\ ,\ \lambda = l_c\ \ ,\ a = a_p$ (105)
temperature is the same :(102)

(55) $\Rightarrow$ $k = (G/K_e)^{1/2} = 8{,}6164\times10^{-11}\ C/Kg$ (106)
(91) $\Rightarrow$ $\beta = (n_1/n_2)^{-3}.N^{-3}.\pi^{*2}.k.l_c/\varepsilon_0.T^2,\ \ a = a_p,$ (107)

this equation will not be affected. Equation (102)will be modified at temperature applications, applications 4, 5.
Because $\beta>0$ is should be and $a>0$ and $k>0$ so $Q>0$, of course as long as $m>0$. Because the positive charges have the same sign, they are expelled and these forces are cancelled out by the attractive gravitational forces.
If it were $m<0$, k would have the opposite sign (+ or -) of Q and $t_c=K_e. m.\rho_c=K_e. m^2.k/l^3$ will have the same sign (+ or -) with k and opposite with Q. (9):$\beta>0$, (7):$\tau>0$, (102) $k>0$ so $Q<0$. The negative charges are creating repulsive forces that would be added to antigravity, so the above relations would not be valid.

APPLICATION TO THE MASSES

Because the above equations were derived using basic mathematics, it is possible to eliminate those coefficients which influence the accurate measurement of the masses, so that they may be compared with the real masses. That's why three different places are going to be chosen from the above analysis for the extraction of three different masses, and their ratios are going to be calculated. These ratios will be pure numbers. The method is going to be a simple dimensional analysis.

1. Hypothesis 2: $Q = k.m$, $Q = e = 1,602\times10^{-19}$ C, (54) :
$k=(G/2\pi.K_{el})^{1/2} = 3,43745\times10^{-11}$ C/Kg arises :

h**ypothesis5.1a) $m=e/k > 0 \Rightarrow$ $m_{eg} = 4,66094\times10^{-9}$ kg > 0** (108)
hypothesis5.1b) $m_{eg} = 1,8594\times10^{-9}$ kg > 0 (109)

In order for the mass to be positive, $m>0$ the constant k should has the sign (+ or -) of the electric charge, otherwise it will result in negative mass and the situation of antigravity. But already it is accepted that $k>0$ and $e>0$ is the charge of proton.

2. Hypothesis 3 : oscillation period $T=1/f$ is in effect
$T^2= \theta_O{}^2.4\pi^2.\lambda/g \Rightarrow$ (110)
$g_\lambda = 4\pi^2.\theta_O{}^2.\lambda/ T^2$, $T =\lambda/c \Rightarrow$
$g_\lambda = 4\pi^2.\theta_O{}^2.\lambda/(\lambda/c)^2$, (111)

hypothesis 4: $\mathbf{g_\lambda = g_c = k.}\boldsymbol{E}$, (22)$\Rightarrow$ (112)
$g_c = k. K_e.Q/ l_c{}^2 = 4\pi^2.\theta_O{}^2.\lambda./ (\lambda/c)^2$,ypothesis 2 $\Rightarrow$ (113)
$k. K_e.k.m_c/ l_c{}^2 = 4\pi^2.\theta_O{}^2.c^2/\lambda \Rightarrow$ (114)
$m_c = (l_c{}^2/\lambda).4\pi^2.\theta_O{}^2.c^2/k^2. K_e \Rightarrow$ (115)

a) for $\theta_O = 1/2\pi$, $\theta_c = \theta_g = 1$,
for $\lambda = 2\pi. l_c$ it will be
$m_c = c^2.l_c/ 2.\pi.k^2. K_{el}$, for $\mathbf{l_c = \lambda_{Planck}}$ **(116)**
$\mathbf{m_c = c^2.\lambda_{Planck} / 2\pi.k^2. K_{el} = 2,17671.10^{-8}\ kg = M_{Planck} > 0}$ (117)

c) $\theta_O = 1, \theta_c = \theta_g = 1$

for $\mathbf{2\pi.l_c = (\lambda.\lambda_{Planck}/2\pi)^{1/2} \Rightarrow m_c = M_{Planck} > 0}$ **(118)**

The equivalent mass of the charge is equal to the Planck mass
The relation (117)makes completely compatible the theory GUT with the hypotheses 2, 3, 4.
My opinion is that the ypothesis 5.1.b) is better , because agree to empirical type of proton ,but 5.1.a)agree to applications of the forces in the square of total energy , also ypothesis b) agree that the forces added logarithmicaly, as presents at the end of this article

APPLICATION TO TEMPERATURES OF THE GUT THEORY

(102)$\Rightarrow$ $T = (n_1/n_2)^{-3/2}. N^{-3/2}.1,085\times10^{16}.Q/ (\lambda.l_c)^{1/2}$
, $\lambda = l_c \Rightarrow$ (119)
$T = (n_1/n_2)^{-3/2}. N^{-3/2}.1,085\times10^{16}.Q/ (l_c^2)^{1/2} \Rightarrow$ (120)
$T = (n_1/n_2)^{-3/2}. N^{-3/2}.1,085\times10^{16}.Q/ (l_c^2)^{1/2} \Rightarrow$ (121)
$\mathbf{T = (n_1/n_2)^{-3/2}. N^{-3/2}.1,085\times10^{16}.Q/l_c}$ (123)

1. PROTON

$T = (n_1/n_2)^{-3/2}.N^{-3/2}.1,085\times10^{16}.Q/ l_c$,
$\lambda = l_c = 10^{-15}.m$, (124)
$Q = |e| = 1,602\times10^{-19}C$ (125)
$T = (n_1/n_2)^{-3/2}.N^{-3/2}.1,085\times10^{16}.Q/ l_c$, (126)
$T = (n_1/n_2)^{-3/2}.N^{-3/2}.1,738\times10^{12}\ K \leq 10^{12}\ K$ (127)
For $(n_1/n_2)^{-3/2}.N^{-3/2} \leq 0,575$ (128)
so $(n_1/n_2).N \geq (0,575)^{-2/3} = 1,446$ then $T \leq 10^{12}\ K$ (129)
This is in agreement with the theory.

2. QUARK

For $\lambda = l_c = 10^{-18}.m$ and $Q = |e|$ then
$T = (n_1/n_2)^{-3/2}.N^{-3/2}.1,738\times10^{15}\ K \leq 10^{16}\ K$, (130)
for $(n_1/n_2)^{-3/2}.N^{-3/2} \leq 5,754$ or (131)
$(n_1/n_2).N \geq 0,311$. (132)
This result is in agreement with the GUT theory, where the quark are kept in hadronians (10^{12} K, 10^{16} K)

3. particle X

$\lambda = l_c = 10^{-30}m$, $Q = |e|$ as a constant,
$T = (n_1/n_2)^{-3/2}.N^{-3/2}.1,085\times10^{16}.Q/ l_c \Rightarrow$ (133)
$T = N^{-3/2}.1,738\times10^{27}\ K \leq 10^{28}\ K$ (134)

For $(n_1/n_2)^{-3/2}.N^{-3/2} \leq 5{,}754$ or
$(n_1/n_2).N \geq 0{,}311$. (135)

Electroweak range (10^{16} K, 10^{28} K), Higgs bosons appearaccording to the theory.

4.
(117)$\Rightarrow l_c = \lambda_{Planck}$ Introducing the length of Planck :
$\boldsymbol{\lambda_{Planck}}$, arises a temperature of the big unification (10^{28} K, 10^{32} K).
(102)$\Rightarrow$ $T =(n_1/n_2)^{-3/2}.\ N^{-3/2}.1{,}085\times10^{16}.Q/\ (\lambda.l_c)^{1/2}$,
$Q = |e|$, $l_c = \lambda = \lambda_{Planck}$, are valid
$T = (n_1/n_2)^{-3/2}.\ N^{-3/2}.1{,}085\times10^{16}.e/\ \lambda_{Planck} \Rightarrow$ (136)
$T =(n_1/n_2)^{-3/2}.\ N^{-3/2}.1{,}075\times10^{32}.K$ (137)
for $T \leq T_{Planck} = 1{,}416\times10^{32}$ K $\Rightarrow$ (138)
$(n_1/n_2)^{-3/2}.N^{-3/2} \leq 1{,}416/1{,}075 =$ **1,31663** or (139)
$(n_1/n_2).N \geq 1{,}31663^{-2/3} = 0{,}832 \approx 5/6$ or $10/12$, (140)

But N must be a natural number and at the unification point takes the rate 1.
For N =1 (unification point),
$T = (10/12)^{-3/2}.N^{-3/2}.1{,}085\times10^{16}.\ e\ /\ \lambda_{Planck} \Rightarrow$ (141)

$T = (10/12)^{-3/2}.1{,}075\times10^{32}$ K =
$=1{,}4137\times10^{32}$ K $\approx T_{Planck}$, $n_1=10$, $n_2=12$. (142)

At the highest Planck temperature, the quantum number of the oscillation that is equivalent to the electric energy is the n_1=10 quantum number, equal to the degrees of freedom of the thermal movement, so n_1 expresses the size at the space. The quantum number of the oscillation with the thermal movement is n_2=12 and is as much as the number of waves of λ oscillation that is equivalent to the electric.
The above relation (142)brings into agreement the GUT theory with the analysis of the hypotheses, since for the derivation of equation (102)of the temperature all the basic equations of the analysis of the hypotheses were used.

Examination of hypotheses 6, 7 for $l_c = \lambda = lx$
They could be chosen 1. $E = N.hc/\lambda$, $N.k_{bl}.T = h.c/\lambda$
2. $E = hc/\lambda$, $N.k_{bl}.T = h.c/\lambda$
3. $E = h.c/\lambda$, $N.k_{bl}.T = N.h.c/\lambda$.
4. $E = N.h.c/\lambda$, $k_{bl}.T = h.c/\lambda$.
5. $E = h.c/\lambda$, $k_{bl}.T = N.h.c/\lambda$.
6. $E = N.h.c/\lambda$, $k_{bl}.T = N.h.c/\lambda$.

Case l,
At the **case l**, l = lx = λ, **are valid**
the same with $T = 1{,}4139\times10^{32}$ K $\approx T_{Planck}$.

The equation that is contained at the analysis of the hypothesis 7 will help easily the below calculations in any case with the proper change of N places .

$$\mathbf{G = 2\pi.(n_1/n_2)^2.N^2.K_{el}^3.h^2.c^2.\alpha^2.\beta^2/(h.c/N.k_{bl}.T)^4 \ : N^{-6}}$$

Also $\mathbf{T= N^{-6/4}.1,085\times10^{16}.Q/l \ : \ N^{-3/2}}$

Case 2.

The basic equation of temperatures turns (there is no N^2):

$2.\pi.\alpha^2.\beta^2 = N^{-4}.\pi^{*4}/ T^4$, temperature becomes: $T = N^{-1}.1,075\times10^{32}.K$

and is valid : $(1,31648)^{-1} = 0,7596 > 3/4 = 0,75$ so $(3/4)^{-1} =1,333 > 1,31663$

consequently the temperature should be multiplied to 1,333, and the equation of

$T = 1,333.1,075\times10^{32}.K = 1,433\times10^{32}.K > T_{Planck}$, **is not valid** .

Case 3.

No N at the equation of temperature, the same would be valid for the fraction of degrees of freedom too. Without any N or any fraction of degrees of freedom the temperature would be 1,31663 times smaller from the Planck temperature, **is not valid.**

Case 4.

The basic equation of temperatures becomes (there is no N^4):

$2.\pi.\alpha^2.\beta^2= N^{-2}.\pi^{*4}/ T^4$, and the equation of temperature turns to :

$T= N^{-1/2}.1,075\times10^{32}.K$ So for $N^{-1/2}$ is valid :$(1,31663)^{-2} = 0,576 > 4/7=0,571$

the temperature should be multiplied with $(4/7)^{-1/2} =1,3228$,

so $T=1,3228.1,075\times10^{32}.K=1,4228\times10^{32}.K$ which is much bigger that T_{Planck} and **is not valid**.

Case 5.

The basic equation of temperatures becomes: $2.\pi.\alpha^2.\beta^2 = N^4.\pi^{*4}/ T^4$,

and the equation of temperature becomes: $T= N^1.1,075\times10^{32}.K$. So for N^1 is valid :

$(1,31663)^1 < 4/3 = 1,333\ 333$ so the temperature should be multiplied with 1,333, case 2 where T is bigger that T_{Planck} and **is not valid** .

Case 6.

The basic equation of temperatures becomes: $2.\pi.\alpha^2.\beta^2 = N^2.\pi^{*4}/ T^4$,

and the equation of temperature turns :$T = N^{1/2}.1,075\times10^{32}.K$.

So for $N^{1/2}$ is valid :

$(1,31663)^2 =1,733 > 12/7=1,714$ or $< 7/4 = 1,75$

so the temperature should be multiplied with $\mathbf{(12/7)^{1/2}} = 1,3093$ or the $(7/4)^{1/2} =1,3228$,

$T =1,309.1,075\times10^{32}.K=$**$1,408x\ 10^{32}.K$**, **accepted** and

$T =1,3228.1,075\times10^{32}.K= 1,4228\times10^{32}.K$, **is not valid** .

The temperature for 12/7 fraction dimensions (with power to 1/2) approaches T_{Planck} but with smaller approach as concern to fraction of dimensions 10/12 (with power to -3/2).

From the above we see the necessity intodocing the degrees of freedom, since N is a natural number and not decimal and at the unification point it will take the value of 1.

The degrees of freedom will be ordered as following:

a) $E = n_1.N.h.c/\lambda$, $N.k_{bl}.T = n_2.h.c/lx$, the basic equation of temperature is : $2\pi.\alpha^2.\beta^2 = (n_2^4/n_1^2).N^{-6}.\pi^{*4}/ T^4$ so the temperature is :
$T = (n_2/n_1^{1/2}).N^{-3/2}.1{,}085\times10^{16}.|e|/ \lambda_{Planck} \Rightarrow$ $T = (n_2/n_1^{1/2}).N^{-3/2}.1{,}075\times10^{32}.K$
For N =1 and $T = T_{Planck}$ it should be : $(n_2/n_1^{1/2}) =1{,}31663$ η $n_1^{1/2}/ n_2 =0{,}7596 \approx 3/4 = 9^{1/2}/4$, but as before (case 2) it will arise the temperature bigger than the Planck temperature (is not valid).
b) But since the fraction of dimensions gives the bigger approach to Planck temperature when is in power -3/2, it should at the basic equation of temperatures to be at the power -6.

5.
Introducing the **Avogadro (N_A)** constant, to the quantity of the load, we obtain a temperature near of the big unification $T_{Planck}=1{,}416\times10^{32}$ K
If $Q = N_A.|e|$, $\lambda= l = l_e = 5{,}291\times10^{-11}$m or $l = l_e/ N_A$, $Q = e$ then
$T = N^{-3/2}.1{,}085\times10^{16}. N_A.|e|/l_e \Rightarrow$
$T = N^{-3/2}.1{,}978\times10^{31} \leq 1{,}416\times10^{32}$ $K\Rightarrow$ $N^{-3/2}\leq1{,}416/0{,}1978 =7{,}158$ or
$N \geq 7{,}158^{-2/3} =0{,}269\approx3/11$, For N=1 (unification point),
$T = (3/11)^{-3/2}.N^{-3/2}.1{,}085\times10^{16}. N_A.|e|/l_e \Rightarrow$ $T=(3/11)^{-3/2}.1{,}978\times10^{31}=$**$1{,}3887\times10^{32}$ K** $\approx T_{Planck}$.
For the fraction **3/11** are valid the same as for the fraction 10/12.
It follows that the hypotheses 5 and 7 are modified in: $E = (n_1/n_2).N.h.c/\lambda$ and $n_1.N.k_{bl}.T = n_2.h.c/lx$ with the introduction of the degrees of freedom and **$n_1=3$, $n_2=11$** in correspondence, in lower temperature from the highest at length l_e and in particles number N_A.

NATURE OF THE BASIC EQUATION AND π*

π* counted 3,1598199 without dimensions .
from the basic identity $h^2.c^2.G / K_e^3. k_{bl}{}^4= \pi^{*4}$

$h.c = E_c.l$, E = energy, l = length, $G = E_G.l/m^2$, m = mass, Q = electrical charge
$K_e = E_e.l/Q^2$, $k_{bl} = E_T/T$, $E = f.l$, f = force, $Q=k.m$, $k = (G/ 2\pi K_e)^{1/2}$
$h^2.c^2.G / K_e^3. k_{bl}{}^4= \pi^{*4} \Rightarrow$
$(E_c.l_c)^2. (E_G.l_g/m^2)/(E_e .l_c/Q^2)^3.(E_T/N.T)^4 = \pi^{*4} \Rightarrow$ (143)
$(f_c.l_c^2)^2. (f_G.l_g^2/m^2)/(f_e .l_c^2/Q^2)^3.(f_T.l_T/ N.T)^4 = \pi^{*4}$,

$l_g = (2\pi)^{1/2}.l_c \Rightarrow$ (144)

$(f_c^2.f_G. /f_e^3 .f_T^4). (2\pi.Q^6.N^4.T^4/l_T^4.m^2) = \pi^{*4} \Rightarrow$ (145)

$(f_c^2.f_G. /f_e^3 .f_T^4).(4\pi^2.Q^6. N^4.T^4/\pi^{*4}.l_T^4.m^2) = 1 \Rightarrow$ (146)

$(f_c^2.f_G. /f_e^3 .f_T^4). f^{*4}=1$ and (147)

$(2\pi.Q^6. N^4.T^4/\pi^{*4}.l_T^4.m^2) = f^{*4}$,

f*= a remnant force $\Rightarrow$ (148)

$$\mathbf{f_c^2.f_G^1. f^{*4} = f_e^3 .f_T^4} \quad \textbf{(149)}$$

f_c: electromagnetic force f_G: gravitational force f_e: Coulomb force
f_T: thermal force, f*: remnant force .
Instead of forces, the above relation can be written with the form of energy interactions:

$$\mathbf{(E/l)_c^2.(E/l)_G^1. (E/l)^{*4} = (E/l)_e^3 .(E/l)_T^4} \quad \textbf{(150)}$$

The following analysis is valid for both relations in relative conditions. For practical reasons it will be used the first relation.
This can be the basis of the hypothesis that forces are added logarithmically. They are probably applied to an exponential loop.

$2\pi.Q^6. N^4.T^4/ l^4.m^2= \pi^{*4}.f^{*4} \Rightarrow$ (151)

$2\pi.Q^6. N^4.T^4/f^{*4}.l_T^4.m^2= \pi^{*4}$ and (152)

$\mathbf{f^*= (2\pi)^{1/4}.Q^{3/2}.N.T/\pi^*.l_T.m^{1/2}}$ (153)

so $\pi^{*2}= (2\pi)^{1/2}.Q^3. T^2/f^{*2}.l_T^2.m$ and $\pi^{*2}=(3,1598199)^2=9,9844618.Cb^3.Kelvin^2/Joule^2.kg$ or $Cb^3.Kelvin^2.sec^4 /kg^3.m^4$

APPLICATIONS TO THE FORCES

From the above relation of forces, we may obtain applications of masses and energy level

$$\mathbf{f_c^2.f_G^1. f^{*4} = f_e^3 .f_T^4} \quad \textbf{(154)}$$

f_c: electromagnetic force f_G: gravitation force f_e: Coulomb force
f_T: thermal force, f*: remnant force .
We may suppose that one solution of the above function of the forces is:

1. $\mathbf{f_c^2.f_G^1= f_e^3}$ and 2. $\mathbf{f^{*4} = f_T^4}$ **(155)**

1. In order to find the entire energy, we should count the mass of the system.

$f_c^2.f_G^1 = f_e^3 \Rightarrow$
$(h.c/l_c)^2 .(G.m^2/l_g^2) = (K_e.(k.m)^2/l_c^2)^3$,
$l_g = (2\pi)^{1/2}.l_c \Rightarrow$ (156)
$(-(2\pi)^{1/2}.h.c/ l_g)^2.(G.m^2/l_g) =$
$= ((2.\pi)^{1/2}.K_e.(k.m)^2)l_g)^3 \Rightarrow$ (157)

$\mathbf{m^4 = (h.c)^2. G/((2\pi)^{1/2}.(K_e.k^2)^3) \Rightarrow}$ (158)
$\mathbf{m_{cge} = 1{,}7209\times10^{-7}.kg}$

We will examine if the sum of energies of interactions is valid.

The entire energy :
$E_{cge} = -E_c - E_g+E_e = -f_c.l_c - f_g.l_g + f_e.l_c \Rightarrow$ (159)
$E_{cge} = (h.c/l_c - G.m^2/l_g + (K_e.(k.m)^2/l_c)$,
$l_g = (2\pi)^{1/2}.l_c$ (hypothesis 5.1.a) $\Rightarrow$ (160)
$E_{cge} = (-(2\pi)^{1/2}.h.c - G.m^2 + (2\pi)^{1/2}.K_e.(k.m)^2).(1/l_g) \Rightarrow$ (161)

$\mathbf{E_{cge} = A.(1/l_g)}$, (162)

$A = (-(2\pi)^{1/2}.h.c – G.m^2 +(2.\pi)^{1/2}.K_e.(k.m)^2)$,
A = -nc - ng + ne (163)

$nc=(2\pi)^{1/2}.h.c$,
$ng = G.m^2$,
$ne=(2\pi)^{1/2}.K_e.(k.m)^2$ **(165)**

In order for the forces to be equally important, the A-factor must have an order of magnitude equal to 10^{-26} (h.c), so the mass should have an order of magnitude of 10^{-7} ($G.m^2$), so it should be m_{cge}. Specifically, the algebraic addition of the factors is to multiply each one with the number of the dimensions that concerns each interaction. But there is a more important reason: the A-factor must have such a value as to give n_1=10 and n_2=12.

Before this, we should calculate the value of N in the thermodynamic equations. We consider that the system is a black body, so we have:
$n_1.N.k_b.T=n_2.h.c/l_g$ (hypothesis 7) and the force of monochromatic emission

$P = h.c/l_g.\delta t = a.\sigma.S.T^4$, (166)
$\sigma = 5{,}6704\times10^{-8}$ watt/$m^2.K^4$,
$\delta t = l_g/c$, $S = l^2$ ἀρα :
$T = (n_2/n_1).h.c/l_g.k_b.N$ and
$h.c^2/l_g^2 = = a.\sigma. l_g^2.((n_2/n_1).h.c/l_g.k_b.N)^4 \Rightarrow$ (167)
for a=1, $(n_1/n_2)^4.N^4 = a.\sigma.h^3.c^2/k_b^4 = 40{,}8 \Rightarrow$ (168)
$(n_1/n_2).N = 2{,}527$ (169)
for n_1=10, n_2 =12 $\Rightarrow$
N = 3,03 so $l_g = (n_2.h.c)/ n_1.N.k_b.T \Rightarrow$ (170)

$\mathbf{T.l_g = 5{,}755\times10^{-3}.m.K}$. **(171)**

We notice that the number N is the index of the electric force or to sum of the indices of gravity and electromagnetic force. This supports the hypothesis that the indices are dimensions at the space.

$\mathbf{n_1.N.k_b.T = n_2.h.c/l_g =}$
$\mathbf{=E_{cge} = A/\ l_g}$ **(hypothesis 7),** (172)

$N=3$ so $n_1=E_{cge}/N.k_b.T \Rightarrow$ (173)
$n_1=A/N.k_b.\ l_g.T,\ \ l_g.T =5{,}755\times10^{-3}.m.K$. (174)

In order for the number n_1 to be $n_1\approx10$, the A-factor should be:

$\mathbf{A = 3.(-(2.nc)^2-ng^2+(3.ne)^2)^{1/2} =}$
$\mathbf{=2{,}5041\times10^{-24}.J.m/kg^2}$ **(175)**

$2.nc = 9{,}9585\times10^{-25}.J.m/kg^2$, $ng = 1{,}976\times10^{-24}.J.m/kg^2$, $3.ne =2{,}365\times10^{-24}.J.m/kg^2$
The calculations arise from ypothesis 5.1.a

if $\mathbf{A_c=A/3=(-(2.nc)^2-ng^2+(3.ne)^2)^{1/2}}$
then $\mathbf{E_{cge} = 3.Ac/\ l_g =6{,}1815.10^{10}.J}$ **(176)**

So $\mathbf{n_1=A/N.k_b.5{,}755\times10^{-3} = 10{,}50}$ and $\mathbf{n_2=A/h.c=12{,}60}$

the deviation from the required prices 10 and 12 is 5% .
So the sum of the energies is not valid, but the sum of the squares of the energies multiplied by the square of the number of the spatial dimensions of each corresponding interaction:

$\mathbf{E_{cge}^2 = -4.E_c^2- E_g^2 +9.E_e^2}$ **(177)**

$\mathbf{E_c =-3.h.c/\ l_c\ ,\ E_g= -3.G.m^2/\ l_g\ ,}$
$\mathbf{E_e=3.(K_e.(k.m)^2/l_c\ \ ,\ \ l_c = \lambda_{Planck}}$ **(178)**

$\mathbf{2.f^{*4} = f_T^{\ 4}}$ and
$\mathbf{f^*= (2.\pi)^{1/2}.Q^{3/2}.N.T/\pi^*.l_T.m^{1/2}}$ **(179)**

so $\mathbf{f^* = f_T}$, for $Q = |e|$,
$T = T_{Planck} = 1{,}416\times10^{32}.K \Rightarrow$
$E^*= f^*.l_T = (2\pi)^{1/2}.Q^{3/2}.N.T_{Planck}/\pi^*.m^{1/2}$ (180)
$\Rightarrow m.c^2 = (2\pi)^{1/2}.Q^{3/2}.N.T_{Planck}/\pi^*.m^{1/2}$,

for $\mathbf{Q = |e|\ ,\ m = m_{eg}} \Rightarrow$ (181)
$N = \pi^*.m^{3/2}.c^2\ /(2\pi)^{1/2}.|e|^{3/2}.T_{Planck} \Rightarrow$ (182)

N = 3,9713 or **N = 4**

and **5.1a) $E^*=4,189.10^8.J$** ,
5.1b) $E^*=6,632.10^8.J$ (183)

Thus, the electric energy of the remnant force is equivalent to the mass of the electric charge of positron at the Planck temperature The degrees of freedom of the thermal movement that is equivalent to the remnant force are 4 and corresponded to the dimensions of the space.
It may be noticed that the degrees of freedom in both cases are the index of the basic force or the sum of the indices of the forces in each site of equivalency. The force of the electric charge was defined in 3 dimensions of space and remnant force in 4. This fact shows the validity of the theory and its agreement with the real data, as the degrees of freedom arose from universal constants. The forces at that situation of unification are 5 and the sum of the indices 14. But we have already calculated $n_1=10$ as a sum of the dimensions of space and the remnant force consist of electric and thermal interactions , so these are two separate systems and thermal force is between of them . The remnant force is unknown and interact by thermal force .
The final hypothesis for the nature of equation ($h^2.c^2.G / K_{el}^3. k_{bl}^4 = \pi^{*4}$) is that it constitutes a fundamental relationship according to the GUT theory and it describes a relationship among the electromagnetic, gravitational, Coulomb and thermal forces.
Their dimensions are as follows:

Gravitational force	: 1 dimension
Electromagnetic force	: 2 dimensions
Coulomb force	: 3 dimensions
Thermal force	: 4 dimensions
Total:	1+2+3+4 = 10

Remnant force : 4 dimensions

EMPIRICAL TYPES (inclusion of the Avogadro number)

There is an empirical relation that connects the quantities :
M_{Planck}, N_A: Avogadro number, , l_g (length of gravity interaction)=$\lambda_{Planck}.(2\pi)^{1/2}$.
$l_e=5,291\times10^{-11}.m$

$$\mathbf{(m_{eg}.l_e^2 .N_A^{-2}+M_{Planck}.l_g^2)/2=p.(m_{eg}.M_{Planck})^{1/2} .l_e.l_g. N_A^{-1}}$$

$p=1,0000086$ (183)

The quantities $m.l^2$ are moments of inertia and the second member contains a middle rate of moment of inertia. The average is equal to geometric average so:

$$\mathbf{m_{eg}.l_e^2\ .N_A^{-2} = M_{Planck}.l_g^2}$$
$$\mathbf{m_{eg} > 0,\ M_{Planck} > 0} \qquad (184)$$

This m_{eg} is of ypothesis 5.1a)
From the above relation we obtain the length : $\mathbf{l_e/N_A}=8{,}788\times10^{-35}.m$
The tendency of inactivity of the equivalent mass of the electric charge of the electron at the length of the electric charge l_e is equal to the tendency of inactivity of the Planck mass. This relation makes compatible the hypothesis 2: Q=k.m with the theory GUT.
The interesting part of the above relation is that though the Planck mass presupposes temperatures that do not occur our empiric world, m_{eg} as an equivalent mass of the charge of the electron, which is valid everywhere. Even the neutral particles may considered to have mutual-confutation charges and the same is valid and for each point of a filed that can create mutual-confutation particles. The taking from the space of m_{eg} transfers the unification relations to the compatible space of the observed particles.
Empirical form of angular momentum that it relevant to the mass of proton.

$$\mathbf{(N_A.m_p.\ (m_{eg}/(2\pi)^{1/2}))^{1/2}\ .c.\ \lambda_{plank}} = p.\mathbf{10.h},\ p = 1{,}0065$$
$$\mathbf{m_{eg} > 0} \qquad \mathbf{(185)}$$

This $(m_{eg}/(2\pi)^{1/2}$ is m_{eg} of ypothesis 5.1.b
m_p=mass of proton, l_g (length of gravity interaction)=$\lambda_{Planck}.(2.\pi)^{1/2}$.
Since m_{eg} contains the constant k of the hypothesis 2, which means that has a real existence to the above formation angular momentum of the proton

END

PAPER TWO (2006OCT-2008 SEPT)

Abstract
By the below analysis arises the substance of fine structure constant and the connection of mole of proton with gravity , also we have prediction of neutrino energy .The mechanism , the shape and the factor of CMB radiation . Using a unified mass meg we can calculate and explain the nuclear energies of particles : proton, π^0+ , W ,…..The mass meg related with mass of plank .We explain the length 7,25fermi of proton's spectrum . Also the function of density mass under pressure of gravity in agreement with Sun's core temperature .

INTRODUCTION

We use the functions of paper with title :

Electromagnetic interaction of gravity. Proposal for unified field theory. http://www.wbabin.net/science/alexandris.pdf

(we will name :first paper , symbol : **fp**) , author : Nikos Alexandris .It is the same with paper : http://www.acadjournal.com/2006/V17/part5/p2/ , (second paper,symbol :**sp**) but have numbers all the functions .

Symbols

meg = 4,66.10^{-9}.kg = 2.61x10^{18}.GeV/c^2 of 5.1a) function (108) fp or (15) of second paper (sp), function 103 of paper fp or next line to (14) function of second paper(sp): m=e/k > 0 , e+ : positron electric charge , K_e: Coulomb constant ,

k = $(G/2\pi.K_e)^{1/2}$ = $(2G.\varepsilon 0)^{1/2}$=3,437.10^{-11}.Cb/kg, G: gravity constant ,π =3.14..,c:speed of light ,λ_{plank} : length of plank , h: plank constant , le:radius of Bohr(a_0) or lengthof electric charge or radius of H , 5.29x10^{-11}.m , Na:avogadro's number , k_b: Boltzman's constant .

Main article

RELATIVITY

It is usefull to study some of the basic subjects of our work and try the application of the proposed equations.

Function 8 first paper(fp) or close to (2) at second paper(sp): electric potential Ue=Um/k and Ue=c^2/k , Um=c^2 , k=q/m ,

q : electrical charge , m : equivalent mass of the electric charge , c : speed of light, k : a constant .

These equations are referred to some kind of equivalence between the electric charge and a mass having some specific properties. The potential cannot be of the form Ue=v^2/2k because it is not relativistic; the charge remains constant with velocity and its equivalent mass of the charge too. ***This mass (meg) follows the Principle of charge conservation.***

This mass has been called meg . The meg exists into the laws of the Nature as a simple factor; it has the property of gravity mass but it has not the property of the inertial mass.

The meg is introduced into Newton's, Coulomb's.

The ***absence of the relativistic variation of the meg*** is compensated by the relativistic length variation.

Function (2) first paper(fp) or close to (1) second paper(sp): The ½ factor in the energy of the self-induction $E= (1/2) L.i^2$ is found in the $8\pi^2$ of function (16) fp (or (4) sp) as $\theta o^2/2$ (θo is the coefficient of the shape); the factor ½ is seen in the functions (38) fp (or (7) sp) and (46) fp (or (8) sp) as parameter of β (disappearing from the final equations).
The ½ in function (18) fp (or first line hypothesis 4 of sp)does not affects the function (20) fp (or fourth line of hypothesis 4) i.e. $\tau\alpha = Cgx^2/k^2$. The relativity exists into the equations but the results remain the same.

For small velocities probably the length lg is double and the reaseant perhaps is relativity :
γ is relativity parameter 1/sqrt(1-(v2/c2))

$$\text{for } \upsilon << c \ , (\gamma-1).c^2 = v^2/2 \quad , (01a)$$

and the constant of the (102) fp (or 3rd line next to (14) sp) takes the half of the original value; thus the (102) gives Wien's law for N=1, $n_1=10$, $n_2=12$, but must lg = lc . We give the solution of this disagreement with hypotheses in other paragraph : 1….CMB

SQUARE OF ENERGIES

175 function fp (or paragraph applications to the forces , middle , A parameter sp) $A=2{,}5041\times10^{-24}.J.m$, is valid for $T.lg = 5{,}755\times10^{-3}.m.K$:171 function and $n_1=10{,}5$ and $n_2=12{,}6$, but for $n_1=10$ and $n_2=12$, $A=2{,}383\times10^{-24}.J.m$: 177 function
so we call this factor $A_{177}=2{,}383\times10^{-24}.J.m$
From 172,174 functions $A= n_1.N.k_b(l_g.T)$ arises in Wien's law system:

$$A_{wien}= n_1.N.k_b(l_g.T)/2 = 1{,}1918\times10^{-24}.J.m, \ n_1=10 \ , N=3 \quad , (01b)$$

We believe that we can use the squares of energies (179,180 functions fp or applications to the forces ,middle,sp) in variable lengths , for atom of hydrogen (H) and proton wile in former paper we used the function 179 for lengths close to Plank lengths .
The approximation in 176,178 can be zero by the following analysis :
Function (179) $E_{cge}^2 = -4.E_c^2- E_g^2 +9.E_e^2$

$E_c =-3.h.c/ l_c$, $E_g= -3.G.m^2 / l_g$, $E_e=3.(K_e.(k.m)^2/l_c$, $l_g=l_c.sqrt(2\pi)$
From (158) function ,fp (paragraph applications to the forces , at beginning):
$m = m_{cge} = 1{,}7209\times10^{-7}.kg$ and this mass comes from function 155 :

$$f_c^2.f_G^1= f_e^3 \qquad (02a)$$

the relation of forces : electromagnetic , gravitational and electrical force . We rename the E_{cge} to

$$E_{sqrt} =sqrt(-4.E_c^2- E_g^2 +9.E_e^2) \qquad (02b)$$

$$E_{sqrt} =6{,}5963\times10^{-14}.J \qquad (03)$$

From 162,172 could be : $E_{cge} = A_{175}/sqrt(2).\ l_c$,
E_{sqrt} / E_{cge} = 1,97 or (04)
for A_{177} sqrt(2). l_c , we have :E_{sqrt} / E_{cge} = 2,07 (05)
thaus E_{cge} = 2.A/sqrt(2). l_c or (06)
E_{cge} = A/(sqrt(2)/2). l_c = A/(sqrt(2)/2).
l_c = A/cos45°. l_c (07)
so E_{cge} = A/cos45°. l_c (08a)

Applications :

1. cosmic radiation CMB
2. Fine structure constant analysis
3. Proton
4. Nuclear particles
5. Fine structure of Proton
6. Function of density of mass under pressure of gravity

1.cosmic radiation CMB

Function 171 of first paper(sp) or applications to the forces , middle,sp
The relation of length and temperature incites us to examine whether the system works at low temperatures

T.lg = 5,755x10^{-3} .m.K .

Function 171 of paper :

$$T.lg = 5{,}755x10^{-3}.m.K$$

this constant is the double the Wien's constant .That arises for lg = sqrt(2.π).lc , n1/n2=10/12 , N=3
Function 102 in the paper (fp) (or 3rd line next to (14) sp) gives the double constant of Wien's law :

$$T = (n_1/n_2)^{-3/2}.\ N^{-3/2}.1{,}085\times10^{16}.Q/\ (\lambda.l_c)^{1/2}$$

Type error λ = lc , we put in case this hypothesis for simplicity .
For n1=10 , n2=12 , N=1 , Q = e , electron-positron electric charge *(APPLICATION TO TEMPERATURES OF THE GUT THEORY)* arises Tplank , if we introduce lg = λplank .$(\lambda.l_c)^{1/2}$ = lg from the hypotheses of the paper .

It is in force that $\lambda=2\pi lc$, $lg = (2\pi)^{1/2} .lc$, $lg = \lambda/(2\pi)^{1/2}$, lg is the wavelength of gravity , but this function gives T.lg ≠ Wiens's constant. Especially for $lg = \lambda/(2\pi)^{1/2}$ arises $T.\lambda \approx$ 2.Wiens's constant. That means ***this function does not work with CMB radiation*** .

In function (102) we find Planck's temperature if we use lg as Planck's length and we find the indexes n1=10 , n2=12 at (142) . But the problem with GUT is that lc is the smaller length and not lg .This asymphony with GUT arises because in (94) we use the density of electric charge $\rho c\lambda=Q/\lambda.lc^2$ and not $\rho c =Q/ lc^3$ .If we do that, then (102) we have temperature that depends only on lc and not on $(\lambda.lc)^{1/2}= lg$ .Because lc is the smaller length, we use lc = Planck's length and we have planck's temperature and indexes n1=10 , n2=12 .Also for length lg we have

T.lg ~2. Wiens's constant , (08b)

The same relation T.lg we find in (171) ,fp , in ''application to the forces'' ,using the Stefan-Boltzman's law and hypothesis 7. We find the ***double constant of Wien's law*** Also we find again n1=10 , n2=12 .In (176) , (177) in the squares of energies we find indexes n1=10,5 and n2=12,6 .These aproximations of indexes are improved in this paper at first paragraph .

So $T.l_g = 5,755\times10^{-3}.m.K$ = 2.Wien's constant , (08c)

sqrt(2.π) comes from values of length λ = 2πlc= lg.sqrt(2π), hypothesis 5

the functions 102 fp and 171 fp are not the same but they give the same constant for N=1 (102) fp and N=3 (171) fp

CMB radiation has energy $P/S = 1,9X10^{-3}.w/m^2$,

this value in the law of Stefan-Boltzman without shape $P/S=\sigma.T^4$,
gives 13,52K

Then in modified law of Wien (in function 171) $T.lg=5,755\times10^{-3}.m.K$ so
lg = 0,42mm
λ=2πlc , lg=sqrt(2π).lc so
λ=sqrt(2π).lg =1,052mm , (09)
the cosmic microwave background radiation (CMB).

1.1.Factor of CMB Radiation

We use the functions 151,153 fp or end of paragraph : nature of the basic equation and π* we have :

$$\pi^{*2} = (2\pi)^{1/2}.N^2.Q^3.T^2/(f^{*2}.l^{*2}.m) \quad ,(010)$$

f: force , l:length,m:mass ,T:temperature ,Q:electric charge .

This function comes from (77) fp or end of hypothesis 7(*) and we call that equation central : $h^2.c^2.G / K_e^3. k_{bl}^4 = π^{*4}$ **.**

(*) But we must fix the error line 6 : $l_g=(2π)^{1/2}.l_c$ *so* $4π^2$ *must be* $2π$

So we replace the energy E =f*.l and we have :

$$π^{*2} = (2π)^{1/2}.N^2.Q^3.T^2/(E^2.m) \qquad ,(011)$$

We replace energy E with m. c^2 so arises

$$π^{*2} = (2π)^{1/2}.N^2.Q^3.T^2/(m^3 .c^4) \qquad ,(012)$$

With Q=k.m , hypothesis 2 of paper electromagnetic interaction of gravity(k is 51a constant ,$3,437.10^{-11}$.Cb/kg) *, the function is:*

$$π^{*2} = (2π)^{1/2}.N^2.k^3.T^2/ c^4 \qquad , (013)$$

And : $π^{*2}. c^4 / (2π)^{1/2}. k^3 = N^2.T^2 \qquad ,(014)$

So $$\mathbf{N.T= π^*. c^2 / (2π)^{1/4}. k^{3/2}} \qquad \mathbf{, (015)}$$

$k =(G/2π.K_e)^{1/2} = (2Gε_0)^{1/2} = 3,437.10^{-11}$.Cb/kg 5.1a .For N=1 then T=2π.Tplank

If l*=l/2π so T=Tplank .The l length will be λ and l* = lc , hypothesis 4 : λ = 2π.lc

Using the function (12) of mass or energy -Temperature and replacing as temperature, the value T=2,73.K (that is the temperature of CMB radiation), we find the rest mass of an electron or positron. Because positrons are required in space, so CMB radiation comes from ***positrons*** *.*
the function is :

$$\boldsymbol{m^3 = (2π)^{1/2}.N^2.e^3.T^2/(π^{*2}.c^4)} \qquad \boldsymbol{, (016)}$$

m = mass , e = electric charge of electron or positron , T = temperature, π*=3,1598 with units, c = speed of light, N=1, π =3,14... ,T_{plank} : temperature of plank = $1,416.10^{32}$*K.*

1.2Mechanism of CMB radiation

The conclusion is that the CMB radiation comes from another oscilation than in Wien's law. Especially the radiation of ***CMB comes from the λ oscilator*** and not from the lg oscillator, if we use the Stefan-Boltzman law without shape.The modified Wien’s law with the temperature of the Stefan-Boltzman’s law without the shape of the surface, is :

$\mathbf{T.\lambda_{max} = 2.(2\pi)^{1/2}}$.***Wien's constant ,***

$\mathbf{\lambda_{max}=(2\pi)^{1/2}}$.*lg* , *(017)*

But we can see that the function of energy-temperature for CMB temperature 2,73K gives the mass of an electron or positron, so the function works with Wien's law.

Using the function of density in the solar system, we find that lg is the radius or diameter of a body. That means the double constant of Wiens we found arises because lg is diameter lg = 2r, r: radius of the body

In the beginninig of paper we put in case the hypothesis that double Wien's constant is caused by relativity:

$(\gamma-1)c^2/v^2=1/2$ so Wien's law is :

T.lg = $(\gamma-1)c^2/v^2$.2.Wien's constant , (018)

If these conditions are the same for CMB, the emition comes from the λ oscilator and lg = $\lambda_{max}/(2\pi)^{1/2}$, lg is the wave length of gravity. If in experiments we do not find any diference in Wien's law at different velocities, the conclusion is that lg is the diameter of the body.
For the Stefan-Boltzman law, if it is in agreement with Plank's law of temperature, the conclusion is that CMB is a special phenomenon with a strange structure. It remains to examine and test the function of temperature-energy, but we must try it with Stefan-Boltzman's law and Plank's law of temperature.

1.3Shape of CMB factor

We can see that the function energy-temperature works with Wien's law. We know that the problem of CMB radiation is that Wien's law is in disagreement with the Stefan-Boltzman law if the body is an ideal black body with coeficient 1 . In my theory, if we accept the existence of three oscilators lc,lg,λ , the Stefan-Boltzman law gives in the modified law of Wien, the same result of length emition with Plank's law and Wien's law. But the Stefan-Boltzman temperature is 5 times that of the Plank law, so we have two temperatures.
If we introduce the coeficient of shape of the CMB body, it must be $\mathbf{(2.(2\pi)^{1/2})^4}$, so the temperature of Stefan-Boltzman is the same as the Plank temperature and Wien's law does not change. The coefficient of shape of the CMB factor is $(2.(2\pi)^{1/2})^4 = 16.4\pi^2$, if the surface is l^2 in Stefan-Boltzman's law then the **surface of shape** is $16.4\pi^2.l^2$ or

$$S = 64\pi^2 . l^2 \quad , (019)$$

Now we will use Wien’s law to find the length of emition.
If we use Stefan-Boltzman’ law without the shape of the body, we must use the modified Wien's law.
The modified Wien's law has a constant double of Wien's law. A convenient solution is to accept that the lg is diameter of the body so Wien's constant remains, with lg = 2.radius of the body.
We put in case of the hypothesis, that 1/2 could come from relativity. We know that the atomic clocks depend on relativity, so why not the emition in Wien's law? If that happens we must see again all the problems one more time.
In CMB radiation, the emition of Stefan-Boltzman comes from the λ oscilator. In Plank's law, the emition comes from Wien's length. It remains to examine if the velocity of oscilation influences Stefan Boltzman's law and Wien's law. What makes the diference: relativity or the structure? The function of mass-energy and temperature works with protons and high energies? Can we see the three lengths λ,lc,lg ?

2a.Fine structure constant

We start with these empirical types of angular momentum of meg

2π.(5meg).c.λplank/h=1.071 , (1)
2π.(6meg).c.(le/Na)/h=6.986 , (2)
2π.(5meg).c.λplank/h =
= 2π.(6meg).c.(le/Na)/7.h so , (3a)

5.(7/6) = le/(Na.λplank) , (3b)

le : radius of Bohr or length of electrical charge (a_0) = 5.29.10.$^{-11}$ .m, , Na : Avogadro number , λplank : length of Plank = 1.616.10.$^{-35}$.m

We find the 5.(7/6) parameter in nuclear particle index in proton mass

We use 6/7 to analyse the fine structure
137,3134.(6/7).meg = Na.me
me = mass of electron also , (4)

for proton
Mp:mass of proton , Lp: length of proton
From function 195 fp or paragraph , empirical types , we have :

(Na.mp.meg/(2π)^{½})$^{1/2}$.c.λplank=10,0067.h
Na.mp = 100.h^2.(2π)$^{1/2}$/meg.c^2.λplank^2

$$\mathbf{N_a . m_p = A . m_{eg} \quad , (5)}$$

$A=100.h^2.(2\pi)^{1/2}/meg^2.c^2.\lambda plank^2$, (6a)
From function 5 : A_5= 216110,057 , (6b)
And from function 6a :
A_6= 215826,3357 , A_5/ A_6=1.0013 , (7)
Also for electron :

$\mathbf{N_a.m_e = B.m_{eg}}$ **, (8)**

And B=137,3134.(6/7)=
=$(6/7).(E1/E2)^2$, (9)

$E1/E2 = (137,3134)^{½}$=
=$137^{1/2}$ = 11,7 , (10)
11,7.(6/7)=10,04 , (11)
so B=10.(E1/E2)=(6/7).(1/a) , (12)
Na.me = 10.(E1/E2).meg , (13)

For proton
Eplank/Emeg = 4,670113 = $(1/ap)^{½}$, (14a)
Fine structure constant of proton : ap = 0,04585

E_{plank}^2/E_{meg}^2=21,80995 , (14b)

$E_{plank}=m_{plank}c^2$, m_{plank} = $2.176.10^{-8}$ .kg
This number comes from angular momentum of electron(J_e)

$\mathbf{E_{plank}^2/E_{meg}^2=J_e/h}$ **=**

$\mathbf{=1/a_p}$ **= 21,80995 , (15a)**

so positron ,electron and proton are linked.

We need to refer the 194 , fp function or paragraph , empirical types sp :

$m_{eg}.l_e^2.N_A^{-2} = M_{Planck}.l_g^2$, charge and length of charge(radius of Bohr , a_0) are connected by meg and length of plank
A.ap = 9895,71

and $\mathbf{a_p/a=2\pi}$ **or** $\mathbf{a_p=2\pi.a}$ **,**
a =1/137,035 , (15b)

2b.Neutrino

An other way to analyse the fine structure constant of electron is :

p.(6/7).160,1989.(6/7).meg= Na.me ,
approximation p = 1 , (16)

m_e : mass of electron = $9.109.10^{-31}$.kg

$p.(6/7)^2.5.2^5$.meg = Na.me ,
with p=1,0012 , (17)

and 5.2^5 =160

that's mean the fine structure constant is :
1/137.14 = (7/6)/5. 2^5 , (18a)

137,***14***-137,035 = 0.1 , (18b)

We propose for angular momentum of electron in meg system :

Je.meg=137,035.h/2π + h/10.2π or

Je.meg=137.h/2π + 0,14h/2π , (19a)

(18a) function gives the fine structure 1/137.14 , that's mean energy : E = 0.14.h.c/2π.le = $8.36x10^{-17}$.J =
=522.eV/c2 so , (19b)

for one level the energy is :
E/137 = 3.81eV , (19c)

also h/10.2π gives energy :
E = 0.10.h.c/2π.le =
=372,8.eV, E/137 = 2,72.eV , (19d)

I remind you that meg and proton are linked , and these empirical types will give us the potential of spectrum verification .

3.Proton

Mp:mass of proton , ***Lp***: length of proton
From function 195 fp and function 1 of 2a paragraph of the present paper we have :

$(Na.mp.meg/(2\pi)^{1/2})^{1/2}$.c.λplank=10,0067.h
2π.(5meg).c.λplank=1.071.h , we have

$(Na.mp.meg/(2\pi)^{1/2})^{1/2}$.c.λplank/10=2π.(5meg).c.λplank , (20)

arises :

$$\mathbf{p.N_a.m_p = 10^4.\pi^2.(2\pi)^{1/2}.m_{eg} , p = 1,1447} \quad \mathbf{, (21)}$$

Function (1) this paper: 2π.(5meg).c.λplank/h=1.071 , (22)
With the angular momentum of proton :

mp.c.Lp = np.h and 2π.(5meg).c.λplank=h , (23)
mp.c.Lp/np = 2π.(5meg).c.λplank , (24)
arises : Lp/np = 10.π.meg.λplank/mp = 1.4147 fermi

for np=1 without 2π , (25)

with 2π Lp/np =0.225 fermi , (26)

The length in 25 function could arise from a dynamic of meg $c^2/2$
so Lp/np=1fermi , (27)

The length in 25 function could arise from a dynamic , $c^2/2$, because
1.414=sqrt(2) and length will be 1fermi

From function (26) we get length 0,225fermi
At first it seems that exist this length , but we find that proton has **fine structure constant : 1/21,8** or **2π.α** , α is the fine structure of electron 1/137,035 .

So the angular momentum of proton is : mp.c.4,9fermi = 21,8.(h/2π) .
4,9fermi is characteristic length of nucleus .
Perhaps we can analyse more **4,9fermi** as 1,96fermi.2,5 = 1,96fermi.sqrt(2π)= lg , lg is gravity length , the electromagnetic lengt is lc=1,96fermi and existe λ=2π.lc = 12,3fermi .The lengths lg,lc,λ comes from hypotheses of first paper .So we can experementantly examine these hypotheses .

4.Nuclear particles

parameter: **6/7** from functions (2),(4),(18) this paper
2π.(6meg).c.(le/Na)/h=6.986
137,3134.(6/7).meg = Na.me , me = mass of electron
Structure of proton
1/ap=21,8 from functions (14),(15) this paper
Eplank/ Emeg = 4,670113 = $(1/ap)^{½}$
ap/a=2π or ap=2π.a , a=1/137,035

energy to be 1/ap=21 :
E_0 =0.8hc/(2π.1fermi)=159,82 MeV/C2 , (28)

3μ=2 E_0

K+=3 E_0

(6/7).η=3 E_0
(6/7).p=5E_0
(6/7).n=5.E_0
Λ=7 E_0

(6/7).Ξ0=7 E_0
(6/7).Ξ-=7 E_0
(6/7).Ω=9 E_0
π+=(6/7)E_0
π0=(6/7)E_0

Boson W(kg) =(6/7).100.mp = 1.43375.10^{-25}
mp = mass of proton

	MeV/C2	MeV/C2		diverse MeV/c2
μ	105.7	106.546	0.004	0.85
τ	1784		9.568	
K+	493.7	479.46	2.647	-14.24
K0s	497.7		2.669	
			0	
η	548.8	559.37	2.943	10.57
p	938.3	932.283	5.032	-6.02
n	939.6	932.283	5.039	-7.32
Λ	1115.6	1118.74	5.983	3.14
Σ+	1189.4		6.379	
Σ0	1192.5		6.395	
Σ-	1197.3		6.421	
Ξ0	1315	1305.196	7.052	-9.80
Ξ-	1321	1305.196	7.085	-15.80
Ω	1672	1678.11	8.967	6.11
π+	139.6	136.988		-2.61
π0	135	136.988		1.99

	Real	Calculated	Diverse
Boson W(kg)	80.398.GeV/c2	80.426.GeV/c2	0.028.GeV/c2

From this approach it seems that we talk about unified theory were the particles π+ and boson have very good approximation , also we can see the numbers of particles η ,(p,n) ,Ξ , Ω : 3, 5, 7, 9 in order in an approximation of 0,8-1,5 %. The unified approach was obvious from proton equations in the former paper of applications .

In particle index the energies come from structure of proton(coefficient 0,8),6/7 and length 1fermi . The same results we can have in 1,072fermi with 0,8 and without 6/7 , also in 0,9fermi without 0,8 and 6/7 .

We can experementantly to examine these lengths and particle approach .
proton structure 1/ap=21,8
21,8/3=7,26 this is equal to coefficient of nuclear spectrum function(like Rydberg function).

Some interesting calculations:

if we use the approximation 1,1447 of 21 function (this paper)
1.4147 fermi/1,1447 =1,2358 fermi

and 5.0,225fermi=1,125f , (29a)

Also h/(mp.c)=1,321fermi and 1,321/1,1447=1,1547 fermi

so 1,32/1,14=1,1547 ≈ 1,16=7/6 and , (29b)

7,25/6,28 =1,15 ≈ 7/6 or 2π/7,25 ≈ 6/7 , (30)
this must be the natural mater of 6/7

7,25fermi/0,225fermi=32,2 , (31)
32,2=2^5+0.2 , (32)

5.Fine structure of proton

from function (26) we have :

Lp/np=2π.0,225fermi=1,41f =
10π.meg.λplank/mp , np=1 without 2π , (33)
also from (31),(32) we have :
2^5x0,225fermi =7,2fermi ≈ 7,25fermi , (34)

from (31) ,(32),(33)
we have : 2π.(7,25/(2^5))fermi = 10πmeg.λplank/mp so , (35)
mp.7,25fermi = 5.(2^5)meg.λplank

from (18a)we have : a=1/137,035 and
we gave the hypothesis that 1/a=(6/7)x5x2^5
and arises : mp.7,25fermi = (1/a).(7/6).meg.λplank so , (36)

α.mp.(7,25/2π).1fermi = (7/6).(1/2π).meg.λplank , (37) the approximation of this function is 1 if the length is 0,993fermi .

we can see that 7,25/2π equalized to 7/6 and for 1/2π we can say that 1/2π has the meaning of fine structure , but is not the fine structure of meg because 2π.a = ap : the fine structure of proton , a is the fine structure of electron , so meg has fine structure 1
So the right equation is:

$$ap.mp(7,25/2\pi).0,993fermi = f_{meg}.(7/6).meg.\lambda plank \quad , (38)$$

f_{meg} =1 is the fine structure of meg

*The analysis of previus version of paper about **1/2π** is perhaps **wrong** , it is an extreme hypothesis that it will be fine structure of space*

The approximation of this equation is 1 if length is 0,993fermi
Also 1,072fermi gives the particles in order η ,(p,n) ,Ξ , Ω : 3,5,7,9 in index particles So the diverse or fermi is : -0.007f +1fermi + 0,07f
The 0,993fermi gives in function of index particles :

$$E_0 = 0,8hc/(2\pi.l) = 160,94MeV/c2 \quad , (39)$$

as in particle index arises energy of proton
(7/6)x5x160,94.MeV/c2 = 938.8MeV/c2 , (40)
better approximation of index particles
There existe a particle at the meson level that gives the other nuclear particles:
E_0 = 160,94MeV/c^2 at

$$0.993fermi \text{ or } 2\pi 0.993fermi = 6.23fermi . \quad , (41)$$

For this particle is in a force so that :
$5(7/6)160,94.MeV/c^2 = 938.8MeV/c^2 = m_p+m_e$, (42)
From function (3b) of this paper , we know that :
$5(7/6) = l_e/(N_a.\lambda_{plank})$ so arises the interaction :

$$E_0/(N_a.\lambda_{plank}) = (m_p+m_e)/l_e \quad , (43)$$

These interactions act in an atom of hydrogen and there seems to existe microcells in the atom with length , λ_{plank} .
The E_0 particle will be a ***meson Higgs particle .***
Mp : mass of proton , λ_{plank}: plank length ,me: mass of electron , l_e: radius of Bohr (it is refered in paper as length of electric charge , or radius of atom of Hydrogen) , N_a : Avogadro Number

6. DENSITY OF MASS

We 'll use the transformations , next to (47) fp or close to function (9) sp: Also will use the function of papameter ***β*** of function (91) and (104) fp 5.1a (and not (107) because is 5.1b) or function (12) and close to (14) sp next two lines (and not the other next six lines , it is 5.1b)

$\beta = (n_1/n_2)^{-3}.N^{-3}.\pi^{*2}.k.l_c/(2\pi)^{1/2}.\varepsilon_0.T^2$, $a = a_p$, 5.1a , (44)

n1=10 , n2=12 , N=1 , π*=3,1598 with units ,

ε_0=8,8542.10^{-12}, π=3,14… , (45)

5.1a : β=26,738.lc/T^2 or β=10,667.lg/T^2 , (46)

5.1b : β=168.lc/T^2 , lc = lg , (47)

main transformations : k=β.tc

5.1a : k =$(G/2\pi.K_e)^{1/2}$ = 3,43745×10^{-11} C/Kg , , (48)

5.1b : k =$(G/K_e)^{1/2}$ = 8,6164×10^{-11} C/Kg , (49)

so 5.1a tc = k/β = 1,285.10^{-12} .**T^2/lc and**

tc = 3,222.10^{-12} .**T^2/lg , (50)**

5.1b tc = k/β = 0,512.10^{-12} .**T^2/lc** , lc = lg , (51)

N=1 , n1=10 , n2=12 , π*=3,1598 ,with gravity length : lg = (2π) $^{1/2}$**.lc**

main transformations : tc=Ke.m.ρc = Ke.ρm.e

also set : m.ρc=ρm.e , ρc is the density of electric charge : ρc= e/V and ρm is the density of mass :ρm=m/ V , V: volume, e : electric charge of electron or positron. Ke : Coulomb constant = 1/4πεo

5.1a ρm = tc/(Ke.e) = 8,928.10^{-4} .**T^2/lc and**

ρm = 22,379.10^{-4} .**T^2/lg , (52)**

5.1b ρm = tc/(Ke.e) = 3,562.10^{-12} .**T^2/lc , lc = lg , (53)**

Our work can not refuse the 5.1b hypothesis but in our research we can not accept that lc = lg because we accept that lg = (2π) $^{1/2}$**.lc**

ρm = 8,928.10^{-4} .T^2/lc , (54)

and m = 8,928.10^{-4} .V.T^2/lc , (55) First we calculate macrocosmos to examine how functions work :

SUN : m is mass of Sun $m=1{,}989.10^{30}$.kg , density of Sun $\rho m=1{,}41.10^{3}$.kg/m^{3} Radius of Sun $R=6{,}95.10^{8}$.m

so density of mass is : $\boldsymbol{\rho m = 8{,}928.10^{-4} .T^2/lc}$, we do not know from our theory yet the relation about lc and radius of the body . if lc is R then :

$T^2 = \rho m.R/\mathbf{8{,}928.10^{-4}}$ **and** $\mathbf{T= 3{,}31.10^{7}}$ **.K**

This will be the temperature of **core of Sun** that we aspect .So the density function under pressure of gravity concerns the ***core of the body with maximum temperature .***

We do not know the temperature of the core of the Sun so we must try both lengths lc , lg . If the radius of the Sun is lc, then the temperature is $3{,}16.10^{7}$.K for the volume of a sphere. If the radius is lg, the temperature is 2.10^{7}.K, if lg is the diameter of the Sun then the temperature of the core is $2{,}8.\ 10^{7}$.K . We understand that it is difficult to verify the differences of these hypotheses, but we are close to the real temperature of the core of the Sun. The significant thing is that the functions are in force in low temperatures and that gives hope for experiments in a laboratory.

The function of density could be a universal law.So the functions work in macrocosmos as in mirocosmos. That means that the hypotheses cover a complete universal theory.

END

***Paper 3**(oct 2008)*

Predictions of Temperatures at High Energies

We use use the function that gives the rest mass of the positron with a temperature of
2,73.K of CMB radiation .We will test this function in collider conditions at several
energies .

Introduction

We use the functions of the paper entitled: Electromagnetic interaction of gravity.
Proposal for unified field theory.
http://www.wbabin.net/science/alexandris.pdf , (The symbol for this paper: fp) , author : Nikos Alexandris .Similarly with paper : http://www.acadjournal.com/2006/V17/part5/p2/ ,(with symbol :sp) but with numbers
for all the functions.

Description of the Theory

All calculations in this theory include an algebric and computational aproach with
Excel computing . We propose a model with 7 hypotheses. In this model, the universal constants and laws must be in harmony. The beginning of the issue starts
with dimensional analysis and that is why the area or the field is uknown .

Example :

Energies and lengths of waves appear quantized and monochromatic. The energies
and lengths of waves are statistical and thermodynamic . Energies and waves are at
maximum size at characteristic frequencies .That is obvious in cosmic microwave
background radiation (cmb). The oscillators give a continous spectrum, so we can see
an intensity as :

I=E/t =$(hc/\lambda)_{MIDDLE}$ /T , but it is actually Na.$(hc/\lambda)_{MIDDLE}$/(Na.T) , t = Na.T

E= energy , Na=avogadro number , t = time , T=period or 1/frequency .

The statistic function of energy is the Sum(hc/λn), n=index , so hc/λ describes the maximum energy
of interaction at the chracteristic frequency : c/λ of an oscilator.

By the way of these hypotheses it were possible to find the parameters of oscilator like
n1,n2 and Wien's constant. We have the same situation with the equation in thermodynmics: kinetic energy of **an** atom =(3/2).kb.T, kb = Boltzman's constant

More work is needed for this model to be a completed physics theory with a statistical
and therodynamic aproach .We must advise that this easy and simple aproach includes
300 functions. We understand that a more specific work would make this model enormous, so it is better to test some of the hypotheses or functions of this model in
present theories and experiments .

CMB radiation

As we can see in a body that are in force, our functions exist three
lengths of three oscilations λ, lc, lg and are close to the radius of the body. Also in
CMB radiation, we see that Wien's length is one of three lengths of the λ .
This is a **physics- mathematical proof** but not a 100% physics proof .

a) We input the intensity of CMB radiation in Stefan-Boltzman's law with the shape
of the factor . The shape arises from the hypotheses of the theory. We get the temperature of Wien's or Planck's law.

b)We input the temperature of CMB in the function of energy-Temperature that comes from the same theory and we get universal contants, including the mass of the
electron-positron. If we proove that CMB radiation comes from positrons, we have a
100% physics proof.

We could prove this theory by the fine structure of proton that is calculated at 1/21.8
That constant gives in the angular momentum of the proton, the characteristic length
of the nucleus (core) at 4.9 fermi .That result is close to the proof. The fine structure
of the proton proves the existence of meg.

Also we could prove this theory with:

1.the function of energy - temperature
2.The function of density of mass under pressure of gravity(1)
3.The existence of Higgs meson that proves the existence of meg.
4.Prediction of neutrino's mass that proves the existence of meg(2)
5.The extraction of double Wien's constant(3)

(1)the problem is that the length lc appears in the functionand we do not yet knowthe
relation to the radius of the body .We must find the lc length in the body.

(2)meg is the most difficult hypothesis for acceptence . meg is so accepted than plank
mass (mplank).meg and mplank does not have experemental acceptence. All my
research involved finding a way to get real proofs of the existence of both masses .If
we find proofs of one mass we have a proof of the other .

(3)We must give an explenation for the double constant with its diameter or relativity
but it must agree with CMB radiation and all universal contants
Factor of CMB Radiation

We use the functions 151,153 fp or end of paragraph : nature of the basic equation
and π* so we have :

$$\pi^{*2} = (2\pi)^{1/2}.N^2.Q^3.T^2/(f^{*2}.l_T^2.m) \qquad (1)$$

f: force , l:length,m:mass ,T:temperature ,Q:electric charge .
This function comes from (77) fp or the end of hypothesis 7 and we call that equation
central: $h^2.c^2.G / K_e^3. k_{bl}^4 = \pi^{*4}$

So we replace the energy $E = f^*.l_T$ and we have :

$$\pi^{*2} = (2\pi)^{1/2}.N^2.Q^3.T^2/(E^2.m) \qquad (2)$$

We replace energy E with m. c^2 so arises :

$$\pi^{*2} = (2\pi)^{1/2}.N^2.Q^3.T^2/(m^3 .c^4) \qquad (3)$$

With Q=k.m , hypothesis 2 of paper electromagnetic interaction of gravity(k is 51a
Constant 3,437.10-11.Cb/kg) , the function is:

$$\pi^{*2} = (2\pi)^{1/2}.N^2.k^3.T^2/c^4 \qquad (4)$$

And : $\pi^{*2}. c^4 / (2\pi)^{1/2}. k^3 = N^2.T^2$ (5)

So $N.T = \pi^*.c^2 / (2\pi)^{1/4}. k^{3/2}$ (6)

$k = (G/2\pi.K_e)^{1/2} = (2G.\varepsilon 0)^{1/2} = 3{,}437.10^{-11}$.Cb/kg 5.1a .

For N=1 then $T=2\pi.T_{plank}$
If $l^*=l/2\pi$ so $T=T_{plank}$. The l length will be λ and $l^* = l_c$, hypothesis 4: $\lambda = 2\pi.l_c$

Using function (3) of mass or energy - Temperature and replacing as temperature, the
value T=2,73.K (that is the temperature of CMB radiation), we find the rest mass of
an electron or positron. Because positrons are required in space, so CMB radiation
comes from positrons.

The function is :

$$\mathbf{m^3 = (2\pi)^{1/2}.N2.e^3.T^2/(\pi^{*2}.c^4)} \qquad \mathbf{(7)}$$

m = mass , e = electric charge of electron or positron , T = temperature, π*=3,1598
with units, c = speed of light, N=1, _ =3,14... ,
T_{plank} : temperature of plank =1,416.1032K.

For length l*, we can write function (7):

$$m^3 = 1,277.10^{-91}.T^2 \qquad (8)$$

or $$m= 5,036.10^{-31}.T^{2/3} \qquad (9)$$

or $$\mathbf{m= 0,511.m_e.T^{2/3}} \qquad \mathbf{(10)}$$

m_e = mass of the electron

conclusion :

The function 7-10 gives temperature plank when gravity force is equal to electric force , also gives the rest of mass of electron for cmbr temperature . The rest mass of electron is every where in universe the same as cmb radiation .

Application at high energies

From function (7) the results are :

Index 1

Collision energy

90GeV	gives : $1,79.10^8$.Kelvin	or	0,015.MeV
100GeV	: $2,1. 10^8$.K		0,018.MeV

120GeV	: 2,76. 10^8.K	0,024.MeV
140GeV	: 3,48. 10^8.K	0,030.MeV
160GeV	: 4,26. 10^8.K	0,044.MeV
180GeV	: 5,08. 10^8.K	0,044.MeV
200GeV	: 5,98. 10^8.K	0,052.MeV

0,5TeV	: 2,3.10^9.Kelvin	0,198.MeV
1TeV	: 6,6.10^9.K	0,568.MeV
2TeV	: 1,8.10^{10}.K	1,611.MeV
5TeV	: 7,4.10^{10}.K	6,376.MeV
10TeV	: 2,1.10^{11}.K	18,09.MeV
15TeV	: 3,7.10^{11}.K	31,88.MeV
25TeV	: 8,3.10^{11}.K	71,52.MeV
30TeV	: 1,09.10^{12}.K	93,92.MeV

If the following predicting values do not give parallel diagrams with experimental
values , the function is not in force in colliders .

Possible coefficients of analogy will be : 2п.T or 2sqrt(2п).T=5.T

example :

index 2 , x2π

Collision energy

10TeV	T=6,28x2,1.10^{11}.K = 1,31.10^{12}.K	or	6,28x18,09= 113,6MeV
5TeV	T=6,28x 7,4.10^{10}.K = 46,47.10^{11}.K		6,28x 6,376= 40MeV
1TeV	T=6,28x 6,6.10^9.K = 41,44.10^{10}.K		6,28x 0,568= 3.56MeV

END

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