The meaning of Quantistic Astrophysics

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98.80.Bp Origin and formation of the Universe

Abstract

Our previous publication, ([1]) with the discovery of the definition of the force of Planck $F_P = \frac{c^4}{8\pi G_N} \equiv \frac{mP \cdot c^2}{8\pi \cdot lP}$ (in which the term on the left of the identity is in relative units and the one the right in Planck units), lead us to continue our investigation in relation to its action and to its new aspects in physics (hydro-dynamic regime) in which the foreseen gravitational curvature bosons $F_P \to W_K^{\pm,0}(\mu, e, \tau)$ determine in astrophysics, and which we are presenting in this paper. With the aim of obtaining a *uniqueness in representation* of the physical phenomenon taken into examination, we impose conditions around the boundaries of definitions regarding parameters and that the pseudotensorial bosons $W_K^{\pm,0}$ establish in relation to their curved rays $r_{K_{WK}}$, to their energy density $\rho(m_{WK}c^2, V_{WK})$ and to the local Schwarzschild metrics $ds^2(g_{\alpha\beta})$, in the time-space of our Solar System (SS) taken into examination, as an astrophysics sample. The univocal consequences of the spontaneous symmetry breaking are examined in between the curvature field $R_{\alpha\beta}$ (R) and the metric field $-\frac{1}{2}Rg_{\alpha\beta}$ (ds^2) in the field equation of General Relativity (GR), in a hydro-dynamic regime.

Introduction

A first investigation is carried out referred to astrophysics body trial runs in the SS, laying down the conditions around interval $0 \to r_{K_{WK}}$, between zero and the corresponding curvature ray $r_{K_{WK}}$, which the original curvature boson $W_K^{\pm,0}$ establishes in space-time with the action of the pseudotensorial curvature force $F_P \to M_{\alpha\beta}(F_P)$ which has the property of acting associated with the local Schwarzschild metrics field ds^2 and leads us *to configure the quantity of gravitational binding energy* among planets and their satellites in relation to the Sun.

A second investigation establishes the *Equations of State, of Energy and of inner Curvature which the bosons of curvature establish at the time of Planck*, and *the genesis of time-space codes*. The study is focused on establishing the conditions around the interval $0 \to \tau_P$ related to the inner origin of energy, between zero time and τ_P time of Planck. This leads us by constructing the proper equations of state (with the related functions of state of origin of inner energy and the corresponding inner curvature at interval $0 \to \tau_P$, to associate to the matrix universal constants, *to configure the quantity of universal energy of visible and dark matter of the universe.*

From a thermo-dynamic point of view, the same investigation leads us to configure in the interval $0 \to \tau_E$, between zero and τ_E time of the present expansion of the universe the quantity of dark energy here present. The first and second investigations are able to give the basis for an algebraic theory, purely theoretical of the Quantistic GR (QGR) of which some formal aspects are shown.

1- First investigation related to gravitational binding energy and solar system in the field of General Relativity.

§1.1-Planck potential and the force of the pseudotensorial curvature.

In order to describe the energy generation exchange related to $W_K^{\pm,0}$ bosons we consider the potential of form

1) $$P_P = -\frac{C_{N/C}}{4}[\varphi^2 - \eta^2]^2$$

in which $C_{N/C} = \frac{(m_e \cdot m_{\bar{e}}/r_e^2)G_N}{(e \cdot e/r_e^2)\varepsilon_0^{-1}} = 1.9098 \cdot 10^{-44}$ is the a-dimensional constant related to gravitational N (Newton's) coupling, the electron and the electric repulsion of Coulomb's (C= Coulomb) discharged electron, potential which is independent from distance. We decided to denominate the potential P_P [1] Planck's potential .

To have a better understanding of this generational exchange of energy, we consider in the potential [1] the two fields of physics $\varphi(R_{\alpha\beta}) = r_{K_{m_P}} F_P$ and $\eta(ds^2) = -(8\pi)^2 m_P c^2$ (in which $F_P = \frac{mP \cdot c^2}{8\pi \cdot lP}$ is the force of Planck ([1])), in the pseudotensorial representation of Landau-Lifshitz's form (LL) ([2]) with the structure here below :

2) $$t_{LL}^{\mu\nu} = -\frac{c^4}{8\pi G_N} G^{\mu\nu} + \frac{c^4}{8\pi G_N(-g)}[(-g)(g^{\mu\nu}g^{\alpha\beta} - g^{\mu\alpha}g^{\nu\beta})]_{,\alpha\beta}$$

in which $G^{\mu\nu}$ is Einstein's tensor (which is constructed from the metric system); $\frac{c^4}{8\pi G_N} \equiv \frac{mP \cdot c^2}{8\pi \cdot lP}$ is the force of Planck parameter; $G^{\mu\nu}$ is the opposite of the metric tensor ; $g = det(g_{\mu\nu})$ is the determinant of the metric tensor; $,\alpha\beta = \frac{\partial^2}{\partial x^\alpha \partial x^\beta}$ are the secondary partial derivatives. Tensor [2] satisfies the law of conservation $\left((T^{\mu\nu} + t_{LL}^{\mu\nu})\sqrt{-g}\right)_{,\mu} = 0$ and the real fields of physics $\varphi(R_{\alpha\beta})$ and $\eta(ds^2)$ can now be reported to pseudo-tensors

3) $$M_{\alpha\beta}(t_{LL}^{\mu\nu}) = \begin{bmatrix} \left(\frac{W_K c^2}{V_{WK}}\right)(r_{WK})^2 0 & 0 & 0 \\ 0 & .-1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & 0 & 0 & -1 \end{bmatrix}$$

in which $\frac{m_{WK}c^2}{V_{WK}} = \rho$ is the density of energy of the boson curvature m_{WK} (which is twenty-one times the mass of Planck); V_{WK} is the volume of the boson mass $W_K^{\pm,0}$ and $\left(r_{K_{WK}}\right)^2$ both derive from the conclusive Schwarzschild matrix (see the matrix form which follows), which are sufficient conditions in order to standardize it to the pseudo-Landau-Lifshitz tensor $t_{LL}^{\mu\nu} \rightarrow t^{\mu\nu}(M_{\alpha\beta})$ so that [2] becomes

4) $$t^{\mu\nu}(M_{\alpha\beta}) = -M_{\alpha\beta}G^{\mu\nu} + M_{\alpha\beta}\frac{1}{(-g)}[(-g)(g^{\mu\nu}g^{\alpha\beta} - g^{\mu\alpha}g^{\nu\beta})]_{,\alpha\beta}$$

and [3] becomes

5) $$M_{\alpha\beta}(t^{\mu\nu}) = \begin{bmatrix} \rho(r_{K_{WK}})^2 0 & 0 & 0 \\ 0 \quad .-1 & 0 & 0 \\ 0 \quad 0 & -1 & 0 \\ 0 \quad 0 & 0 & -1 \end{bmatrix}$$

$\rho(r_{K_{WK}})^2$ has the physical dimensions of a single force and the tensor $M_{\alpha\beta}$ shall be named pseudotensorial curvature force which has what is needed to react associated to the local matrix field ds^2, as shall be shown later. This tensor satisfies the conditions of representation [4] when at the stage of expectation in the vacuum field $\eta(ds^2) = -(8\pi)^2 m_{WK} c^2$ the symmetry of the two fields $\eta(ds^2)$ and $\varphi(R_{\alpha\beta})$ spontaneously breaks down and also satisfies the law of conservation.

4)bis $$\left(\left(T^{\alpha\beta} + t^{\mu\nu}(M_{\alpha\beta})\right)\sqrt{-g}\right)_{,\alpha} = 0$$

in which $\sqrt{-g}$ is the absolute value of the jacobian determinant in which g is the jacobian determinant $det[g_{\alpha\beta}]$ of the Schwarzschild metric and $(t^{\mu\nu}(M_{\alpha\beta})\sqrt{-g})$ is the tensorial density of the pseudotensorial force. This physical hypothesis is able to describe the *quantity of gravitational binding energy* that the pseudotensorial bosons establish in relation to their energy density and to their curvature rays and to the local Schwarzschild metric, in the curvature field in the S.S. time –space, as a system sample in astrophysics testing, all to be shown in paragraph **§1.3**.

The [5] is the insurgence of the force of Planck mutation ([1]) of RG when the symmetry between the curvature field and the metric field are locally broken down spontaneously, in such a way that the relation between the two forces is

5)bis $$F_P K(m_P) r_{W_K}{}^2 \rightarrow |M_{\alpha\beta}|$$

In which $K(m_P)$ is the curvature of the Planck mass and r_{W_K} is the ray of curvature of the boson of curvature m_{WK}. [5bis] explains the behaviour of [5] in relation to the RG force of Planck.

§1.2- Comparison with Tolman-Oppenheimer-Volkoff's metric state equation

Historically, according to our present-day knowledge, Tolman-Oppenheimer-Volkoff's state of equation ([3]) , ([4]) , which places limits on the structure of a symmetric spherical body of isotropic matter, which is in gravitational static equilibrium, based on RG models, has shown to be imprecise for a star of neutrons. The value obtained also for delimited mass is affected my the same imprecision, but we refer to it simply by a pure conceptual significant. Said equation comes from the Field Equation (FE) of RG for a general metric which does not vary in time, which is

6) $$ds^2 = e^{\nu(r)} c^2 dt^2 - (1 - 2G_N m(r)/rc^2)^{-1} dr^2 - r^2(d\theta^2 + sin^2\theta d\phi^2)$$

If the Tolman-Oppenheimer-Volkoff equation (which is reported here within), is applied to a sphere surrounded by isotropic material in the vacuum, we should, as in our case, impose the condition to the contour zero pressure (r)=0 is the condition $e^{\nu(r)} = 1 - 2G_N m(r)/rc^2$. Such condition is imposed in order to keep the metric continuous, with a sole static solution, symmetric of the field equations in the vacuum, which is the metric of Schwarzschild.

By applying such conditions to the contour and by using Schwarzschild's metric $g_{\alpha\beta}\,(ds^2)$ and by describing it in the matrix form:

7) $$g_{\alpha\beta} = \begin{bmatrix} 1 - \dfrac{l_P \cdot m_E}{m_P \cdot \left| r_{(K_E)} \right|} & 0 & 0 & 0 \\ 0 & \left[1 - \dfrac{l_P \cdot m_E}{m_P \cdot \left| r_{(K_E)} \right|}\right]^{-1} & 0 & 0 \\ 0 & 0 & -\left[r_{(K_E)}\right]^2 & 0 \\ 0 & 0 & 0 & -\left[r_{(K_E)}\right]^2 \cdot Sin\theta \end{bmatrix}$$

in which l_P, m_P are respectively the length and mass of Planck, m_E is the mass of the astrophysics body sample, in this case the astrophysics proof of the Earth ; r_{K_E} is the curvature ray of the Earth. We can, as we will see, evaluate the limits of the gravitational binding energy on the inner side of the curvature $r_{K_{m_{WK}}}$ = 3.015113·$10^6\,m$ of the boson m_{W_K} (which is the same as twenty–one times the mass of Planck) established by the boson itself and that it satisfies the field equation of RG and the potential [1] and the metric [7]; θ is the corner of curvature coupling.

§ 1.3- The gravitational binding energy

$m_0\,(r_0)$ is the total mass on the inner side of the curvature ray $r_{K_{m_{WK}}} = r_{K_{m_{WK}}}(0)$ measured by the metric field by an observer placed on the external circumference limit of the curvature ray $r_{K_{m_{WK}}}$ which satisfies the condition surrounding $m_0\,(0) = 0$. If at the contour it is worth $r = r_{K_{m_{WK}}}$ the continuity of the metric [7] requires the definition of $m_E(g_{\alpha\beta})$ and the potential P_P, require that

8) $$m_0 = m\left(rK_{m_{WK}}\right) = \int_0^{rK\left(m_{WK}\right)} \frac{D(\eta)\left[rK\left(m_{WK}\right)\right]^2}{1 - \frac{l_P \cdot m_E}{m_P \cdot rK_{m_E}}}\, drK_{m_{WK}}$$

in which $D(\eta) = \frac{\eta}{V_{m_{WK}}}$ is the density of the originate constant energy; $\eta = 21(8\pi)^2 m_P c^2$ is the value of the originate energy in a vacuum state, which divided by the volume of the original mass of Planck, determines the energy density of boson $W_K^{\pm,0}$, while

9) $$1 - \frac{l_P \cdot m_E}{m_P \cdot rK_{m_E}} = g_{00}$$

is the temporal component of metric [7]. The calculus of the mass calculated integrating the density $D(\eta)$ compared to the radical component g_{11} of the metric [7] in order to satisfy the condition at contour $e^{v(r)} = 1 - 2G_N m(r)/rc^2 = 1 - l_P m(r)/m_P r_{K_{m_E}}$ require that

10) $$m_1 = \int_0^{rK_{m_{WK}}} \frac{D(\eta)\cdot\left[rK\left(m_{WK}\right)\right]^2}{\left(1 - \frac{l_P \cdot m_E}{m_P \cdot rK_{m_E}}\right)^{-1}}\, drK_{m_{WK}}$$

The difference between quantity [8] and [10] will be the **gravitational binding energy** W_B of the astrophysics object $m_E/c^2 = m_{Moon}$ which, as we calculated coincides, for the level of the Earth's energy, exactly with the mass of the terrestrial moon. The difference written, by substituting the symbols of the terms integrating with other similar compact symbols (pseudotensorial force and metric terms) supplies the equation

11) $$\delta m = \int_0^{r_{K m_{WK}}} \frac{|M_{\alpha\beta}|}{g_{00}}\, dr_{K m_{WK}} - \int_0^{r_{K m_{WK}}} \frac{|M_{\alpha\beta}|}{-g_{11}}\, dr_{K m_{WK}} = \frac{m_{Moon}}{c^2} = W_B$$

The limit of gravitational binding energy W_B (B=Binding) on the inner curvature ray $r_{K_{m_{WK}}}$ (of the boson $m_{WK}^{\pm,0}$) are expressed by the difference of the two defined integrals of which integrals are the rapport between the pseudotensorial force $M_{\alpha\beta}$ (pseudo-tensor, which disappears algebraically according to [4] after generation energy) and the temporal and radical components g_{00} and g_{11} of Schwarzschild's metric [7]. The pseudo-tensor disappears algebraically after its transformation of [4], because at a local level it requires that it contains only partial prime derivatives and its determinant $det|M_{\alpha\beta}|$ has the property of changing the volumes contained in local space and to also transfer the angular moment. While the continuity of the Schwarzschild metric is expressed by the difference of the two integrals

12) $$\int_0^{r_{Km_{WK}}} \frac{1}{g_{00}} dr_{Km_{WK}} - \int_0^{r_{Km_{WK}}} \frac{1}{-g_{11}} dr_{Km_{WK}} = r_{Km_{WK}}(g_{\alpha\beta})$$

The equation [11] of the gravitational generation binding energy of the astrophysics body sample, the Earth, also explains the reason of the unicity of the Schwarzschild metric. It is unique because it has the exclusive property of connecting the metric field of the local time-space with the production of the gravitational binding energy.

§1.4- Conclusions referring our first investigation

The scenery which equation [11] reveals referred to the generation of the gravitational binding energy W_B is of great geometric harmony compared to GR which, despite the presence of the new pseudotensorial force $M_{\alpha\beta}$, it enriches it intact validity by *extending it to the basic quantistic dimension on an astrophysics level.*

The generation of the gravitational binding energy applied to a sphere surrounded by isotropic material in the void satisfies the conditions surrounding the zero pressure and the conditions of continuity imposed by the metric of Schwarzschild, that is the only static solution symmetrically spherical of field equations in the vacuum. Equation [11] reduces the integrates of the generative equation to only two entities. The pseudotensorial force $|M_{\alpha\beta}|$ and the two temporal and radial components g_{00} and g_{11} of the Schwarzschild metric $g_{\alpha\beta}$.

The gravitational binding energy is manifested when, the local symmetry breaks down between the curvature field $\varphi(R_{\alpha\beta})$ and the metric field $\eta(g_{\alpha\beta})$ with the production of local pseudotensorial bosons $W_K^{\pm,0}$.

This mechanism establishes a limit (quantized according to lunar mass units) to the gravitational binding energy compared to the central symmetric sphere of the boson curvature and to its extended volume of curvature $r_{K_{WK}}$, volume which becomes modified and transferred integrally from determinant properties of the pseudotensorial force $|M_{\alpha\beta}|$. Such limit, as we calculated, is exactly equal to the energies of the astrophysics moons taken into examination and that placed themselves at a minimum distance (from the center of the planet's symmetric sphere) necessary in order to not interact with the sphere of the curvature ray $r_{K_{WK}}$ and of the tensorial pseudo-boson $W_K^{\pm,0}$. The number of the moons relevant to the energetic levels of the geodectics of the solar system is given by the relation between the ray of the planet with the curvature ray $r_{K_{WK}}$ of the pseudotensorial boson $W_K^{\pm,0}$

13) $$\frac{r_{Planet}}{r_{K_{WK}}} \cdot \pi = n^{\circ} moons$$

Our calculations and the present results explain and describe the role of the moons compared to the observed planet and to its stars. In other words, the moons are the limit of the gravitational binding energy masses established by he planet compared to its central static curvature ray $r_{K_{WK}}$ due to the pseudotensorial boson $\eta = W_K^{\pm,0}$ in order to be able to follow the geodetic around its own star.

§1.5- Observed measure

These calculated results, could be compared with experience by putting them to the test with the following observed tests/steps :

a)-By the exact measurement of the ray of the Earth's nucleus compared to the expected boson curvature ray $W_K^{\pm,0}$ and to the measurement of the orbital barycenter of the Moon compared to the motion of the Earth.

b)-By the radial measurement of the continental shift compared to the Earth's nucleus and to the measurements of sysmic waves compared to the ray $r_{K_{WK}}$ of the volume of the Earth's nucleus.

c)-By the exact measurement of Caronte's orbital barycenter compared to the center of Pluto's mass.

d)-By checking the measurements of the limit of energy reproduced in laboratory experiments on Earth. According to our calculations, the limit will not reach twenty-one times the mass of Planck, which is the mass of the boson curvature. The mass (which is still collocated in the barycenter of our planet). Such mass has the intrinsic properties of generating a curvature ray vector, which, if produced in laboratory, would intereact with the curvature field and metric of the boson within the Earth. If an anti-curvature boson were to be produced in a laboratory, it would generate a wave-like annihilation.

2- Second investigation – The Equations of State, of Energy and of the inner Curvature during Planck's time and the genesis of the temporal-space curves.

Introduction

This study refers to the preceding one belonging to paragraph §**1** entitled : « *The gravitational binding energy and the Solar System, in the General Relativity field* » which, as we have seen, has enabled to determine, by applying opportune conditions to the contour of the form of Oppenheimer-Volkoff's model ([2]), some important physics parameters and the definition of a pseudo-tensor built with energy density, twenty-one times the mass of Planck, associated to the corresponding curvature ray square. Curvature that such mass establishes and in the study of the generation gravitational binding energy in the pause of integral limits from $0 \rightarrow r_{K_{WK}}$, from zero to the boson curvature ray pseudotensorial of curvature $W_K^{\pm,0}$ ([1]), (which has a mass twenty-one times that of Planck's).

In relation to parameters (expressed in Planck natural measurement units) we are now faced to study the physical state of the curvature field K_{WK} of the pseudotensorial boson curvature $W_K^{\pm,0}$ and of the metric field of Schwarzschild in the interval of time $0 \rightarrow \tau_P$, measuring it with a watch from zero time to Planck's time, using the formalism of the conditions of boundaries of the integral limit $\binom{\tau_P}{0}$ in the form of Tolman-Oppenheimer-Volkoff ([3]) ([4]).

Such investigation, as will be seen, leads to the result that energy generated from the interval of time $0 \rightarrow \tau_P$ is exactly equal to the energy of a particle which has the size of twenty-one times the mass of Planck, previously named by us as pseudo-tensorial boson of curvature $W_K^{\pm,0}$. This energy emerges as primary inner energy due to the integral limit $\binom{\tau_P}{0}$ which imposes as a logical consequence the question, which answer follows, as to how it is related compared to the four universal constants : the speed of light, Newton's, Fermi's and Planck's inevitably subjected. This is necessary in order to construct the relative Equations of State, with the means of the General Relativity (GR) and by following the last indications given by A. Einstein : *it is essential to formulate conditions on boundaries in order to have a complete determination of the system of equations relative to the field under examination.* ([5]) .

§ 2.1- Some formal information contained in the fundamental parameter of physics

According to our calculations, we have noticed that the temporal coordinate $v(c)t$ in Minkowski's generic time-space is equal to the curvature ray $r_{K_{WK}}$ of a particle which is twenty-one times the mass of Planck, named by us pseudotensorial boson $W_K^{\pm,0}$ if the speed of diffusion is considered 1/10 of c ; meaning $v(c) = \frac{1}{10\pi^2}c$, and time t is equal to one second, consequently

14) $$vt = \frac{1}{10}c\frac{sec}{\pi^2} = r_{K_{WK}}$$

where the curvature ray is given by the formula of GR

15) $$\left[\sqrt{8\cdot\pi\cdot G_N\cdot\frac{W_K}{V_{(m_P)}\cdot 21\cdot c^2}}\right]^{-1} = r_{(K_{WK})}$$

where W_K is $21\times m_P$ is twenty-one time the mass of Planck ; $r_{K_{mWK}}$= 3.015113$\cdot 10^6\ m$ and $V_{m_P}\cdot 21 = V_{WK}$ is the volume of m_P. We will later see the role that [14] takes on in the matrix formation of the four universal constants $c\tau, G_N, G_F, \hbar,$ regarding Newton's, Fermi's and Planck's speed of light. The importance of the curvature ray must be restated $r_{K_{WK}}$ because, as we will later see, its quadratic form makes up the metrical components g_{22}, g_{33} of the metric of Schwarzschild.

It follows that the time unit in the parameters of quantum physics of [14] spontaneously arises according to the relation

16) $$10\cdot\frac{r_{(K_{WK})}}{c}\cdot\pi^2 = 1 \text{ sec}$$

§ 2.2 –The boundary conditions and the inner relative gravitational energy in the space interval $\mathbf{0 \to \tau_P}$

Following the same indication of paragraph §1.2 we re-write the metrics [7] with a new parameter of the boson $W_K^{\pm,0}$ curvature ray $r_{K_{WK}}$

17) $$g_{\alpha\beta} = \begin{pmatrix} 1-\frac{l_P\cdot m_P}{m_P\cdot\left|r_{(K_{WK})}\right|} & 0 & 0 & 0 \\ 0 & \frac{-1}{1-\frac{l_P\cdot m_P}{m_P\cdot\left|r_{(K_{WK})}\right|}} & 0 & 0 \\ 0 & 0 & \left[-\left[r_{(K_{WK})}\right]\right]^2 & 0 \\ 0 & 0 & 0 & \left[-\left[r_{(K_{WK})}\right]\right]^2\cdot\Theta \end{pmatrix}$$

In which l_P , m_P are respectively the length and the mass of Planck ; $r_{K_{WK}}$ is the of boson curvature ray, we can therefore estimate the limits of the inner gravitational energy at the time limit of Planck where boson $W_K^{\pm,0}$, establishes its curvature ray $r_{K_{mWK}}$ of the [15] of the boson itself and timed by the time-watch of an observer placed at the time limit of Planck and that satisfies the field equation of the GR and the metrics [7] ; θ is the curvature coupling corner. With the same procedure followed in our first investigation, we now write the condition is the of boson curvature ray

18) $$\delta m = \left|M_{\alpha\beta}\right|\cdot\int_0^{\tau_P}\frac{\left(\frac{1}{10}\cdot\frac{c}{\pi^2}\right)}{1-\frac{l_P\cdot W_K}{m_P\cdot r_{(K_{WK})}}}d\tau_P - \left|M_{\alpha\beta}\right|\cdot\int_0^{\tau_P}\frac{\left(\frac{1}{10}\cdot\frac{c}{\pi^2}\right)}{\frac{-1}{1-\frac{l_P\cdot W_K}{m_P\cdot r_{(K_{WK})}}}}d\tau_P = \frac{W_K}{c^2}$$

which produces inner gravitational energy of the astrophysic object $m(\tau)$, divided by $c^2 = W_K$ which, as we calculated, coincides with level $0 \to \tau_P$ of energy at Planck's time exactly with the quantity of twenty-one times the mass of Planck. With [18] we have therefore acquired a relevant principle of physics, being that the inner gravitational energy in the time break $0 \to \tau_P$ is equal to the pseudo-tensor boson energy $W_K^{\pm,0}$ and it is a functional state of energy.

Having undergone all these calculations, it seems that the physics information have already been included in the interval of time $0 \to \tau_P$, *which represent a sort of temporal-space programme evolution*, as if $W_K^{\pm,0}$ were a primary universal *cell organism*.

At this point, we must make a significant observation. The metrics terms of equation [18], according to our calculations, take on the values of 1 and -1 respectively. Therefore, the metrics components g_{00} , g_{11} do not influence on the inner gravitational energy generation. The pseudotensorial force $\mathrm{M}_{\alpha\beta}$ remains which is made up of an energy density $21 m_P c^2 / V_{WK}$ and by the metrics component [17] $g_{22} = r_{K_{WK}}{}^2$. The result is that the generational energy of [18] depends on the force of $\mathrm{M}_{\alpha\beta}$ which for the conservation of [4]bis, in relation to the metrics field is also the action of a tensorial density $\mathrm{M}_{\alpha\beta}\sqrt{-g}$.

These observations indicate that the gravitational energy (in the absense of oscillations in metrics fields) should be indicated as energy of curvature (of the curvature field generated by the same mass of origin of $21 \times m_P c^2$). This is why we called the pseudotensorial boson $W_K^{\pm,0}$ curvature boson. We observed that by acting in timespace, force $\mathrm{M}_{\alpha\beta}$ acts as tensor density that acts with isotropic characters and ways.

§ 2.3-The need to construct the matrix of universal constants in order to determine the relative equations of state

Equation [18] causes the physics parameters described in the phenomenon mentioned. It imposes, as its logical consequence, the involvement and consequence of the universal constants $c\tau_P, G_N, G_F, \hbar$, : regarding the speed of light associated to Planck, Newton and Fermi's time, in the interval of time $0 \to \tau_P$. For the simple reason that at the origin (in the interval of time $0 \to \tau_P$) these said constants had to, as previously mentioned, inevitably be associated to the generation of the origin of primordial energy of the pseudotensorial curvature boson.

The physics idea, which seems to us the most reasonable, is that the universal constants are expressed in the matrix form and that this matrix is interpreted as a proportional link compared to the functions of state, since the inner matrix of interval $0 \to \tau_P$. In its components $\mathrm{K}_{00}; \mathrm{K}_{11}; \mathrm{K}_{22}; \mathrm{K}_{33}$ the basic dimensional state of relativity, gravitation, electroweak interaction and quantistic interaction is represented respectively. Its explicit form is

19)
$$K_{\alpha\beta} = \begin{bmatrix} \tau_P \cdot \left(\frac{1}{10} \cdot \frac{c}{\pi^2} \right) & 0 & 0 & 0 \\ 0 & G_N & 0 & 0 \\ 0 & 0 & G_F & 0 \\ 0 & 0 & 0 & h\pi \end{bmatrix}$$

in which $\mathrm{K}_{00} = \frac{1}{10\pi^2} c\tau_P$ is the temporal connected to Planck's time that has the dimension of length [14]; G_N , G_F, $\hbar$, are, respectively, the experimental values of Newton, Fermi and Planck's constants. The property of this matrix is to possess the dimension of its absolute value $|K_{\alpha\beta}|$ which is homogeneous to the determinant of Schwarzschild's metrics $det[g_{\alpha\beta}]$ and the opposite of the square curvature $1/K_{WK}^2$ of boson W_K. Moreover, it is important to point out that this is necessary in order to find the specific quantities of energy and local speed linked to phenomenons of physics that involve it and that come up in the following intervals : $0 \rightarrow \tau_P$ and $0 \rightarrow \tau_E$. By having, however, the skill to use it mathematically in the ES, it exchanges the indexes of components K_{11}, K_{22}; K_{33} and alternating the constants (in order to seperately describe their action) compared to the intervals of time involved. This detailed research will not be described in this paper.

§ 2.4- The Equation of state of visible matter and dark matter in time interval $0 \rightarrow \tau_P$

Let's begin by building the equation of state in a dynamic gravitational equilibrium which contains the components g_{00} and g_{11} of Schwarzschild matrix. In the interval of time, $0 \rightarrow \tau_P$, takes on the following form :

20)
$$\frac{\dfrac{\int_0^{\tau_P} \dfrac{|M_{\alpha\beta}|\cdot\frac{c}{10}}{g_{00}} d\tau_P - \int_0^{\tau_P} \dfrac{|M_{\alpha\beta}|\cdot\frac{c}{10}}{g_{11}} d\tau_P}{|K_{\alpha\beta}|}}{(K_{WK})^2} = W_U(\tau_P)$$

where $|K_{\alpha\beta}|$ is the matrix of universal constants belonging to [19] and its absolute value (in the interval of time $0 \rightarrow \tau_P$) has the dimension of metres at the fourth power.

The equation of state [20] can now be written concisely with the relative functions of state, in the following way listed here below :

21)
$$\frac{\dfrac{E_{IG}(W_K)}{|K_{\alpha\beta}|}}{K_{W_K}^2(g_{\alpha\beta})} = W_U(\tau_P)$$

where: $E_{IG} = W_K$ is the inner gravitational energy of [18] and is exclusively generated by the boson curvature W_K ; $K_{\alpha\beta}$ is the matrix of the constant universal variables of [19], $K_{W_K}^2$ is the inner curve (which is a function of state) of radicating the formula [15] at the square. From [21] we deduct that at the origin there was the boson curvature $W_K^{\pm,0}$ (particle, anti-particle and neutral) described with the following symbols : $+,-,0$, and by associating it to the universal constants, it generated dark and visible matter.

22)
$$\frac{W_U(\tau_P)}{c^2}\cdot|K_{\alpha\beta}|\cdot(K_{WK})^2 = W_K$$

where $W_K \equiv E_{IG}/c^2$ is the mass of such said particle, anti-particle and neutral, which has the property to generate, besides the final, dark and visible astrophysics masses (which each mass contains copied in its inner nucleus), also the property to establish the equilibrium between the curvature field and the time-space metrics field. This gives origin to all masses, to space and directs time. By being diffused and regulated by $K_{\alpha\beta}$ which is the matrix of the four universal constants, it also establishes a system of primary field information of oscillations of the metrics field compared to the curvature field for the formation of future astrophysics bodies. The information is regulated by oscillations and described by the temporal and radial metrics components g_{00} and g_{11} from [17] where, in the place of the terms of mass and the respective curvature rays, they are substituted by the astrophysics bodies studied. Our calculations show that the energy of the visible and dark matter, originating from the whole universe of [21] is $W_U(\tau_P) = +1{,}9373 \cdot 10^{89} joule$, in the interval of time $0 \rightarrow \tau_P$. [22] shows the essence of character of unicity of W_K .

At this point we observe that, form a point of view of the visible and dark matter (planets, satellites and dusts), the universal constants act in completion, in particular the constant of Fermi which have the dimensions of and energy per volume and is present in all phenomenons of electroweak interaction and in the atomic transformation of stars. It is therefore reasonable to interpret the matrix [19] in equation [20] of the universal constants as corresponding matrix to visible and dark matter measurable in the universe. Whereas, from a dark energy point of view, the same matrix [19] acts without Fermi's constant components and with a positive sign of Newton's constant, all according to our calculations.

§ 2.5- Equations of State of dark matter in interval of time $0 \rightarrow \tau_P$

Consequent to reasons and principles mentioned in the previous paragraph, original dark energy will be given to the Equation of State in the given form [21]

23) $$\frac{\frac{E_{IG}(W_K)}{|K^D_{\alpha\beta}|}}{K^2_{W_K}(g_{\alpha\beta})} = -W_{U_D}(\tau_P) \quad .$$

Our calculations show that $-W_{U_D}(\tau_P) = -8.9873 \cdot 10^{81} joule$ is the original ,dark, universal energy (in the interval of time $0 \rightarrow \tau_P$), where matrix $K^D_{\alpha\beta}$ (*D* = Dark) is the matrix 4x4 of the universal constants of [17] but without Fermi's constant component and with the positive sign of Newton's constant. Equation [23] shows that energy $-W_{U_D}$ (with minus sign) is due to the relationship between particle energy and the pseudo-tensorial boson W_K ($W_K^{\pm 0}$) and the matrix of the universal constants K^Dwithout Fermi's constant divided by the curvature square of the boson itself. What must be pointed out is that the curvature involves the density of energy W_K^0. Schwarzschild's metrics field does not influence the physics phenomenon because components g_{00} and g_{11} of [8] in [21] as also in [14] are exactly equal to 1 and -1. In other words, the metrics does not oscillate, therefore there is no gravitational energy field. It is deduced from these considerations that the sole observable physics quantity is the pseudo-boson W_K ($W_K^{\pm 0}$) which can be researched in future revelations of space probe with opportune measurement techniques from the influence of the curvature ray which is then established on visible and dark bodies.

§ 2.6- Comparison between the Equations of State [21] and [22] and the equations of state with parameters of time interval $0 \rightarrow \tau_E$, from zero to present time of expansion

Let's begin from equation [20], substituting the integral limits in time interval $0 \rightarrow \tau_P$ with timerval of time $0 \rightarrow \tau_E$ from the present state of expansion of the universe, meaning forty-six billions of earth years τ_E

$$46 \cdot 1^9 \cdot tE = \tau_E$$

We, therefore, substitute the temporal component with component [14] and considering the universal constant matrix with negative sign for Newton's constant component and we write integral terms indicating them with notions β_1 and β_2; and τ_E (E=Earth) is the interval of time now considered, the corresponding Equation of State [23] becomes

24) $$\frac{\frac{\int_0^{\tau_E} \beta_1 \, d\tau_E - \int_0^{\tau_E} \beta_2 \, d\tau_E}{\left|\begin{pmatrix} \frac{1 \cdot sec}{10} \cdot \frac{c}{\pi^2} & 0 & 0 & 0 \\ 0 & -G_N & 0 & 0 \\ 0 & 0 & G_F & 0 \\ 0 & 0 & 0 & h_\pi \end{pmatrix}\right|}}{(K_{WK})^2} = W_U(\tau_E)$$

Equation of state [24] expresses dark inner energy in time interval $0 \rightarrow \tau_E$ measured by a time-watch programmed at time limit τ_E. The calculations shows that $W_U(\tau_E) = +2.777 \cdot 10^{98} joule$.

§ 2.7- Comparison between inner ES energies during time interval $0 \rightarrow \tau_E$ with inner ES energies during time interval $0 \rightarrow \tau_E$.

In order to compare the intensity of energy emitted in time interval $0 \rightarrow \tau_P$ compared to the present expansion in time interval $0 \rightarrow \tau_E$ (E=Earth), here below are re-written the corresponding calculations of quantity previously carried out.

a) $W_U(\tau_P) = +1{,}9373 \cdot 10^{89} joule$

Is the quantity of inner energy of the visible and dark matrix in interval $0 \rightarrow \tau_P$

b) $W_{U_D}(\tau_P) = -8.9873 \cdot 10^{81} joule$

Is the quantity of dark energy in interval $0 \rightarrow \tau_P$

c) $W_U(\tau_E) = +2.777 \cdot 10^{98} joule$

Is the quantity of inner energy of dark and visible matter in interval $0 \rightarrow \tau_P$

d) $W_{U_D}(\tau_E) = -1.3046 \cdot 10^{91} joule$

Is the quantity of dark energy visible in interval $0 \rightarrow \tau_P$.

§ 2.8- Comparison between energetic parameters and Hubble's constant parameter

In order to compare energetic parameters of **§ 2.7,** in relation to present astronomical observations, the following reports are written here below :

1)-The relation between energy inherent to the present state of expansion of visible and dark matter in interval $0 \rightarrow \tau_E$ and the inner energy of visible and dark matter in interval $0 \rightarrow \tau_P$ is given by

25) $$\frac{c}{a} = \frac{W_U(\tau_E) = +2.777 \cdot 10^{98} joule}{W_U(\tau_P) = +1{,}9373 \cdot 10^{89} joule} = +1433644763.330408$$

This parameter divided by Hubble's (HP) constant parameter of 70,08 Mpc 230918715,40765 light years is HP's constant astronomical parameter data which determines the identity minus about $\sim 2\pi$.

26) $$\frac{c/a}{HP} = 6.20843901820941$$

2)-The relation between inherent dark energy inherent to the present state of interval $0 \rightarrow \tau_E$ and dark energy in interval $0 \rightarrow \tau_P$ is given by

27) $$\frac{d}{b} = \frac{W_{U_D}(\tau_E) = -1.3046 \cdot 10^{91} joule}{W_{U_D}(\tau_P) = -8.9873 \cdot 10^{81} joule} = +1451603929.990$$

This parameter divided by Hubble's (HP) by 70,8 Mpc = 230918715,40765, which is the astronomical data of Hubble's constant, determines the identity at minus 2π.

28) $$\frac{d/b}{HP} = 6.2862116951489$$

The inequality between parameter [26] and parameter [28] is given by

29) $$\frac{c/a}{HP} \leq \frac{d/b}{HP}$$

This expresses and explains the accelerated character of the present expansion observed.

If we carry out the difference between parameter [26] and parameter [28], we notice that the accelerated expansion depends exclusively on a dark energy curvature field. The mathematical equation of state can actually be prepresented with constitutive elements

30) $$\frac{A/B}{C} = W_{U,D}(\tau_P, \tau_E)$$

Where **A** is the primary energy curvature generated by boson W_K^0 . **B** is the matrix of the universal constants in where its absolute value has the dimension of a distance at the fourth power (dimension corresponding at the determinant of Schwarzschild's matrix) and gives origin to the four coordinate dimensions that we perceive. **C** is the square of A's curvature ray.

§ 3- Conclusions to our second investigation

Our investigation has lead us to recognise the following points, which are explicitly unavoidable (in the sense that we cannot be at random) in order to understand the correspondants of the equations of state.

1°)- The quantity of [14]

31) $$vt = \frac{1}{10} c \frac{sec}{\pi^2} = r_{K_{WK}}$$

has indicated a temporal coordinate that has an identical distance to the curvature ray (according to GR formula) of an energy twenty-one times the mass of Planck. Moreover, it indicated that it intrinsically contains time unit of [14] and [16] and that may now be defined as the duration of $1/\tau_P$ periods of diffusion corresponding to the curvature transition phase from $K_{WK} = 0$ to $K_{WK} \to \tau_P$

32) $$K_{WK} = 0 \quad \to \quad K_{WK} \to \tau_P$$

of the fundamental origin of matter from $0 \to \tau_P$, where $\tau_P = 5.391 \cdot 10^{-44} sec.$

2°)-from distance (curvature ray) $r_{K_{WK}}$ we can algebraically go back to the inner energy of the astro-physics body originally expressed even by defined integrations of [18] in interval $0 \to \tau_P$.

3°)- from a thermo-dynamic point of view, the variations of inner energy is given by the difference bewtween the final expansion state (present) and the initial state at the time of Planck.

33) $$\Delta W(\tau_E, \tau_P) = W_U(\tau_E) - W_U(\tau_P) = 2.77739998062 \cdot 10^{98} joule$$

while work from time τ_P at the present state of expansion τ_E is given by the sum of inner energy and by present expansion

34) $$L(\tau_P, \tau_E) = W_U(\tau_P) + W_U(\tau_E) = 2.77740 \cdot 10^{98} joule$$

The total quantity of heat exchanged is the sum between work [34] and the variation of energy of [33]

35) $$Q = L(\tau_P, \tau_E) + \Delta W(\tau_E, \tau_P) = 5.5548 \cdot 10^{98} joule$$

which, according to the principles of thermo-dynamics is an extensive quantity, from which [35] follows the corresponding density of energy inherent to heat

36) $$đQ - đL = dW(\tau_P) = 0.0000127182807 \; joule/m^3$$

Considering the present volume of universe of

37) $$\frac{4}{3}\pi r_U^3 = V_U = 4.367571447924811 \cdot 10^{103} m^3$$

In which present ray is calculated in $r_U = 2.184659728 \cdot 10^{34} m$, we can write the present formula

38) $$Q \frac{V_{WK}}{V_U} \pi = 4.00511734606695 \cdot 10^{-23} joule$$

Where [38] indicates that the deep radiation observed by the present universe at $2.5 \cdot 10^4 volt =$ $4.005117346 \cdot 10^{-23} joule$ corresponds to the quantity of heat Q of [35] compared to the relation between volume $V_{WK} = 1.00239055 \cdot 10^{-18} m^3$ of the astrophysics body origin W_K^0 and volume V_U of the present universe.

By reporting the quantity of heat of [35] with Boltzmann's constant k_B , we obtain the value of the corresponding temperature which coincides with the temperature of background radiation of the universe observed today :

39) $$Q\frac{V_{WK}}{V_{U}}\pi \cdot k_B^{-1} = T = 2.9011\ \mathrm{K}^0$$

In other words, according to our calculations, the background radiation presently measured is actually due to the density of heat, which is part of the original inner energy measured during Planck's time and measured today, which causes energies a,b,c,d found in paragraph **§ 2.7**, and results belonging to the original curvature compared to the watch measurements of time $0 \to \tau_P$ and time $0 \to \tau_E$.

From a geometrical point of view, the equations of state express a particular dimensional homogeneity in their functions of state, where Schwarszchild's determinant of matrix in **A** has the dimensions of distance at the fourth power, as the absolute value of matrix **B**, and the opposite of dimension of distance at the fourth power made up by the square of curvature in **C.** This dimensional, homogeneous character favours the transformation of one parameter of state to another. This transformation describes and explains the homotopic character of the function of state.

The cosmology model that results from SE highlights a universe that had origin from a primary, minute energy inside Planck's time that which for evolutionary, organic reasons (causes the action of force $M_{\alpha\beta}$ in **A** and in field **C**), which was **replicated** and evolved to form the present state $W_{U,D}(\tau_P, \tau_E)$.

From our point of view, the question of singularity is not taken into question because in a model which comes spontaneously from SE, point zero at time zero is established as the beginning of time [16] and of growth. This growth is generated by information contained within (a spontaneous symmetry breaking in of the two continuing fields of metrics and curvature) and transmitted from energy A from matrix B, which acts as the *gene* to the boson of curvature ***messenger cell*** W_K , in interval $0 \to \tau_P$.

4- Final conclusions inherent to our First and Second investigation :

From a general point of view of the description of temporal space phenomenons in physics, which all known solutions up to today of GR field equations, are reduced to a *unique character of Schwarzschild's solution.* This singleness of character allows us to formally extract from GR only the metrics of Schwarzschild built with the parameters of [7] in which the matrix components $g_{00,}g_{11,}g_{22,}g_{33}$ and its determinant are those which come into play in the algebraic formula representations. This algebraic representation is able to describe discrete, quantistic phenomenons in a finite system, of finite energy, in relation to the spontaneous rupture of symmetry in the curvature and metrics fields which are on-going fields.

In other words, the difficulty that in the past made the description of the representation of field theories (GR) incompatible with the theory of discrete representation (TQ), is overcome by the unitary representation in GR. This foresees the spontaneous rupture of symmetry (discrete generation), that reconciles the ongoing character of the geometric fields of GR with the representation of TQ quantum numbers. This is why the study of our two researches can constitute the basis for an algebraic theory of General Quantistic Relativity. This makes out the meaning of a Astrophysics Theory, Quantum (ATQ), which shall be described with a few principles here below.

5- Formal brief exploration

§5.1- The intensive energetic coupling with $W_K c^2 (0 \to \tau_P)$ on a leptonic and adronic level

In paragraph §1.1, we showed the mutation [5bis] of the force of Planck ([1]) $F_P K(m_P) r_{W_K}{}^2 \to |M_{\alpha\beta}|$ and its action when the symmetry is spontaneously breaking between the curvature field and the metrics field in the local time space and in paragraph § 2.2 also showed the production of inner energy $W_K c^2 (0 \to \tau_P)$ of [18]. In the gravitational decay phenomenon, the energetic coupling intensity $W_K c^2$ on a leptonic and hadronic level corresponds, according to our calculations, to the constant value of $C_{N/C} \rightarrow C_{N/C}^{\frac{1}{2}}$ (in which $C_{N/C} = \frac{(m_e \cdot m_{\Xi}/r_{\Xi}^2)G_N}{(e \cdot e/r_{\Xi}^2)\varepsilon_0{}^{-1}} = 1.9098 \cdot 10^{-44}$) and determines, in a hydro-dynamic regime, the arisal of new foreseen exchange of pseudo-temporal curvature bosons $W_K^{\pm,0}$.

In order to obtain a possible generational hypothesis of decaying gravitational processes on a leptonic level, one begins by calculating a simple parameter report which connects the energy of curvature bosons $E_{W_K} = W_K^{\pm,0} c^2 (0 \rightarrow \tau_P)$ with the energy of electron E_e and the constant of intensity coupling $C_{N/C} = \frac{(m_e \cdot m_{\Xi}/r_{\Xi}^2)G_N}{(e \cdot e/r_{\Xi}^2)\varepsilon_0{}^{-1}} = 2.076115 \cdot 10^{-43}$, associated to the corresponding generating fracture of coupling numbers. The formula is

40) $$\frac{(3)^3}{(2)^5} \frac{W_K^{\pm,0} c^2 (0 \rightarrow \tau_P)}{\pi^2 \sqrt{C_{N/C}}} = E_e$$

which when resolved compared to variable c^2 produces expression :

41) $$\begin{bmatrix} \left[\frac{4}{3}\sqrt{2}\pi\sqrt{C_{N/C}}\right]\frac{1}{W_K^{\pm,0}} \times \sqrt{\frac{W_K^{\pm,0}}{\sqrt{C_{N/C}}} E_e} \\ \left[\frac{-4}{3}\sqrt{2}\pi\sqrt{C_{N/C}}\right]\frac{1}{W_K^{\pm,0}} \times \sqrt{\frac{W_K^{\pm,0}}{\sqrt{C_{N/C}}} E_e} \end{bmatrix} = \begin{bmatrix} \delta c \\ -\delta c \end{bmatrix}$$

Matrix [41] has the notable property of representing and describing parametrically, for each line, the two physics quantities that come into play in phenomenons of gravitational decaying, meaning, the transformation of the boson curvature masses and its quantity of motion. These quantities are related to the space-time variation of a specific speed compared to that of light. The quantity of the first term found in the first matrix line [41] represents the transformation of the mass of the curvature boson in an electron, in which the compensation of energy is given by the electroweak bosons and by the neutrinos

42) $$\left[\frac{4}{3}\sqrt{2}\pi\sqrt{C_{N/C}}\right]\frac{1}{W_K^{\pm,0}} = \rightarrow m_e + W_e + \sum_{k=1}^{3}\left(\nu_e, \nu_\mu, \nu_\tau\right)_k$$

While the quantity of motion of coupling between the boson mass $W_K^{\pm,0}$ and the energy of the electron E_e in the positive and negative components (which are interpreted as particle and anti-particle) is the term :

43) $$\overrightarrow{Q_e} = \sqrt{\frac{W_K^{\pm,0}}{\sqrt{C_{N/C}}} E_e}$$

Observations : the motion quantity is independant from the quantum number (it is not quantized) while the transformation of [42] is $W_e \rightarrow W_K^{\pm}$.

The terms of matrix [41] point out the possibility of an experimental study (and observed in the cosmos) in relation to the change of speed collision compared to $\begin{bmatrix} \delta c \\ -\delta c \end{bmatrix}$ (or related to the explosive speed similar to supernovas) ; by using and verifying the intensity of the coupling constant $\sqrt{C_{N/C}}$ by the measurement readings of the physics event.

44) $$\frac{(3)^3(11)}{(2)^4} \frac{W_K^{\pm,0} c^2 (0 \rightarrow \tau_P)}{\pi \sqrt{C_{N/C}}} = E_\mu$$

45) $$\begin{bmatrix} \left[\frac{4}{99}\sqrt{33}\pi\sqrt{C_{N/C}}\right]\frac{1}{W_K^{\pm,0}} \times \sqrt{\frac{W_K^{\pm,0}}{\sqrt{C_{N/C}}}E_\mu} \\ \left[\frac{-4}{99}\sqrt{33}\pi\sqrt{C_{N/C}}\right]\frac{1}{W_K^{\pm,0}} \times \sqrt{\frac{W_K^{\pm,0}}{\sqrt{C_{N/C}}}E_\mu} \end{bmatrix} = \begin{bmatrix} \delta c \\ -\delta c \end{bmatrix};\ \left[\frac{4}{99}\sqrt{33}\pi\sqrt{C_{N/C}}\right]\frac{1}{W_K} \to m_\mu + \nu_\mu;\ \overrightarrow{Q_\mu} = \sqrt{\frac{W_K^{\pm,0}}{\sqrt{C_{N/C}}}E_\mu}$$

While [40], [41], [42], [43] for proton with W_K^0 are given with the following expressions:

46) $$\frac{(2)^2 5^3)}{(3)}\frac{W_K^{\pm,0} c^{2}{}_{(0\to\tau_p)}}{\pi\sqrt{C_{N/C}}} = E_p$$

47) $$\begin{bmatrix} \left[\frac{1}{50}\sqrt{15}\pi\sqrt{C_{N/C}}\right]\frac{1}{W_K^0} \times \sqrt{\frac{W_K^0}{\sqrt{C_{N/C}}}E_p} \\ \left[\frac{-1}{50}\sqrt{15}\pi\sqrt{C_{N/C}}\right]\frac{1}{W_K^0} \times \sqrt{\frac{W_K^0}{\sqrt{C_{N/C}}}E_p} \end{bmatrix} = \begin{bmatrix} \delta c \\ -\delta c \end{bmatrix}\ ;\ \left[\frac{1}{50}\sqrt{15}\pi\sqrt{C_{N/C}}\right]\frac{1}{W_K^0}\sqrt{\frac{W_K^0}{\sqrt{C_{N/C}}}E_p} \to m_p + \nu_\mu\ ;\ \overrightarrow{Q_p} = \sqrt{\frac{W_K^0}{\sqrt{C_{N/C}}}E_p}$$

§5.2-The intensity of energetic coupling with the curvature boson on an astrophysics bodies level

In order to obtain a possible prediction of generational processes of gravitational decay regarding astrophysics bodies, we can write a similar report [40], in parametric form, which connects the mass and energy E_{W_K} of the origin of the curvature bosons with the energy of the astrophysics bodies being tested starting from the sun and the peculiar coupling scale of intensity. The report is given by

48) $$\frac{16000}{27} \times \frac{W_K^{\pm,0} c^2{}_{(0\to\tau_p)}}{\pi^6 C_{N/C}^{\frac{7}{8}} m_{Sun} c^2} = 1$$

Which resolved compared to variable c^2 produces the following formula

49) $$\begin{bmatrix} \left[\frac{3}{400}\pi^3\sqrt{30}\, C_{N/C}^{\frac{7}{8}}\right]\frac{1}{W_K^{\pm,0}} \times m_{Sun}c^2\sqrt{\frac{W_K^{\pm,0}}{C_{N/C}^{\frac{7}{8}} m_{Sun}c^2}} \\ \left[\frac{-3}{400}\pi^3\sqrt{30}\, C_{N/C}^{\frac{7}{8}}\right]\frac{1}{W_K^{\pm,0}} \times \sqrt{30}\, m_{Sun}c^2\sqrt{\frac{W_K^{\pm,0}}{C_{N/C}^{\frac{7}{8}} m_{Sun}c^2}} \end{bmatrix} = \begin{bmatrix} \delta c \\ -\delta c \end{bmatrix}$$

In which

50) $$\left[\frac{3}{400}\pi^3\sqrt{30}\, C_{N/C}^{\frac{7}{8}}\right]\frac{1}{W_K^{\pm,0}} \to m_{Sun} + W_e + \sum_{k=1}^{3}(\nu_e, \nu_\mu, \nu_\tau)_k$$

represents the transformation of the boson curve in the astrophysics body of the Sun, in which the compensation of energy is supplied by the electroweak bosons and by neutrinos.

The quantity $\pm\frac{1}{W_K^{\pm,0}}$ is the opposite of the boson curvature $\pm W_K^{\pm,0}$ and $\pm\left[\frac{3}{400}\pi^3\sqrt{30}\, C_{N/C}^{\frac{7}{8}}\right]$ are the parametres of coupling intensity , while the greatness

51) $$\overrightarrow{Q_{Sun}} = \pm\, m_{Sun}c^2\sqrt{\frac{W_K^{\pm,0}}{C_{N/C}^{\frac{7}{8}} m_{Sun}c^2}}$$

is the quantity of motion of the coupling intensity between the quantity $\pm\sqrt{\frac{W_K^{\pm,0}}{C_{N/C}^{\frac{7}{8}} m_{Sun}c^2}} = sec/m$ that involves the boson mass $W_K^{\pm,0}$ and energy $m_{Sun}c^2$ of the solar body being tested in the matrix components [49].

What must be observed is that this is where Lorentz's relativistic parametre comes into play with factor

$\gamma = \frac{1}{\sqrt{1-v^2/c^2}}$ in which v is the relative speed between boson $\pm W_K$ and the observer which, in our case, is given by the variation $\begin{bmatrix} \delta c \\ -\delta c \end{bmatrix} \rightarrow \pm v$ compared to the speed of light of [49], which calculations show that Lorentz's factor correspondent is in the case $\gamma = -16.837419940203 68i$, and the final astrophysics body mass is given by

52) $$\frac{\overrightarrow{Q_{Sun}}}{c(-1+\sqrt{2})\gamma} = m_{Sun} \quad ,$$

while solved [49] compared to the variable $m_{Sun}c^2$ produces the equation

53) $$\frac{16000}{27} W_K^{\pm,0} c^2 \frac{1}{C_{N/C}^{\frac{7}{8}} \pi^6} = E_{Sun}$$

in which $E_{Sun} = m_{Sun}c^2$ is the energy of the astrophysics body and shows the role of energy E_{W_K} of the curvature boson in its quantum couplings.

Our calculations show that equation [53] for Earth is given by

54) $$\frac{81}{64} W_K^{\pm,0} c^2 \frac{1}{C_{N/C}^{\frac{3}{4}} \pi} = E_{Earth}$$

And for the moon

55) $$\frac{1}{64} W_K^{\pm,0} c^2 \frac{1}{C_{N/C}^{\frac{3}{4}} \pi} = E_{Moon}$$

§ 5.3 -The Solar System characterisation with quantum numbers

In the analogy with any quantum system, even in the SS as a tested physics system on a geodetic temporal space level, we can determine the quantum number of self value observable of energy E_{Sun} of [48] and establish the value of the quantum number which is observable in the parameter $\frac{16000}{27} = \frac{(2)^7(5)^3}{(3)^3}$ which, also being a periodic number, admits the generational fraction of $\frac{3000}{9}$ which factorises renders $\frac{(2)^3(3)\,(5)^3}{(3)^3}$.

This number depends on the energy $W_K^{\pm,0}c^2$ of the curvature boson placed in the at the centre of the astrophysics body of each geodetic level and resembles the geometric collocation of the astrophysics bodies in groups of three levels of the nine planets.

We can therefore write equation [53] in the form of eigenstate $\mathrm{A}_{\alpha\beta}$ of energy E_{Sun} as a dynamic variable of the system and we obtain

56) $$\mathrm{A}_{\alpha\beta} = \left[\frac{(2)^7(5)^3}{(3)^3}\right] \times \frac{\sum_{k=1}^{3} \mathbf{W}_{\alpha\beta}}{\pi^6 C_{N/C}^{\frac{7}{8}}} = E_{Sun} + W_e + \sum_{k=1}^{3} \left(\nu_e, \nu_\mu, \nu_\tau\right)_k$$

in which

57) $$\frac{\sum_{k=1}^{3} \mathbf{W}_{\alpha\beta}}{\pi^6 C_{N/C}^{\frac{7}{8}}} = \Psi_{\mathrm{Sun}}$$

is the wave function of system e $\mathbf{W}_{\alpha\beta}$, while

58) $$\mathbf{W}_{\alpha\beta} = \begin{bmatrix} (W_K^{\pm,0}c^2)0 & 0 & 0 \\ 0 & (1) & 0 & 0 \\ 0 & 0 & (1\sqrt{-1}) & 0 \\ 0 & 0 & 0 & (-1\sqrt{-1}) \end{bmatrix}$$

is the matrix 4x4 of the curvature boson energies ; from calculations, excess of energy by ~0,33% is due to the generation of planets and their satellites and to the emissions of the inner electroweak bosons W_e and by the emissions of neutrinos, $\sum_{k=1}^{3}(\nu_e,\nu_\mu,\nu_\tau,)_k$, which compensate it.

Another quantum number is $C_{N/C^{\frac{7}{8}}}$, meaning the parameter on the electronic gravitational coupling intensity observable by matter constituting the astrophysics body taken into examination (the Sun).

In the Earth-Moon system, the main quantum number factorised for the Earth is $\frac{(3)^4}{(2)^6}$ and for the Moon $\frac{1}{(2)^6}$, while the constant of electronic gravitational coupling intensity is the same $C_{N/C^{\frac{3}{4}}}$.

The evaluation of coupling intensity of curvature bosons with the force of astro-physics bodies (for example the tested portion of Earth and Moon) can be given by the logarithmic report :

59) $$\frac{\frac{81}{64}W_K\frac{c^2}{C_{N/C^{\frac{3}{4}}}\pi} - \frac{1}{64}W_K\frac{c^2}{C_{N/C^{\frac{3}{4}}}\pi}}{\frac{\ln(10)}{\ln(2\pi)}} = W_K$$

§5.4-Link between the observable eingenstates $A_{\alpha\beta}$ and the Solar System energies with the pseudotensorial force of curvature $M_{\alpha\beta}$

Now, as an example, we are looking to present a physics role that the pseudotensorial force of curvature $M_{\alpha\beta}$ of [5] eingenvalue $A_{\alpha\beta}$ from the energy of the astrophysics bodies as proof of the solar system and shows the geometric measurable links belonging to the astrophysics bodies being observed. By using [56] the report may be written in the following way

60) $$|M_{\alpha\beta}|\left\{\frac{\left[\frac{(2)^7(5)^3}{(3)^3}\right]}{[10]^{k-1}}\right\}^{-1}|\hat{g}_{\alpha\beta}|\, r_{Sun} = \left[\frac{(2)^7(5)^3}{(3)^3}\right]\frac{\sum_{k=1}^{3}W_{\alpha\beta}}{\pi^6 C_{N/C^{\frac{7}{8}}}} = A_{\alpha\beta}$$

in which $\frac{\left[\frac{(2)^7(5)^3}{(3)^3}\right]}{[10]^{k-1}}$ is the parameter of quantum numbers belonging to the eingenstate of the astrophysics body taken into examination (it comes from the serial geometric study of geodetic distribution which we will see later on) ; $|\hat{g}_{\alpha\beta}|$ is an anti-symmetrical matrix ; r_{Sun} is the observable ray of the body taken into study. Equation [60] solved compared to variable r_{Sun} produces the following expression :

61) $$r_{Sun} = \left[\frac{(2)^{14}(5)^6}{(3)^6}\right]\frac{W_K^{\pm,0}c^2}{C_{N/C^{\frac{7}{8}}}\{\pi^6[|M_{\alpha\beta}|[10]^{k-1}|\hat{g}_{\alpha\beta}|]\}}$$

which shows the connection between the curvature boson (the sole energy in play) with the specified quantum number of the eigenstate being considered and with the force of the pseudotensorial expressed with the related intense parametric coupling. It should be kept in mind that, during its action, force $|M_{\alpha\beta}|$, in component M_{00} , contains the density of boson energy W_e and the square of curvature boson ray itself in components g_{22} and g_{33} of Schwarzschild's local metric, thus guaranteeing its continuation in the local timespace. The serial geometric distribution of geodetic levels of quantum numbers of the SS, built with the observed parameters (which come from the equations of form [48]), is given by the expression :

62)
$$\sum_{k=1}^{10}\frac{\left[\frac{(2)^7(5)^3}{(3)^3}\right]}{[10]^{k-1}}$$
$$+\frac{\left[\frac{(2)^8(7)}{(3)^3}\right]}{[10]^{k+7}}+\frac{\left[\frac{(2)^7(5)^3}{(3)^3}\right]}{[10]^{k+6}}+\frac{\left[\frac{(3)^4}{(2)^6}\right]}{[10]^{k+8}}+\frac{\left[\frac{(1)}{(2)^6}\right]}{[10]^{k+10}}$$
$$+\frac{\left[\frac{(2)^8(5)^2}{(3)^3}\right]}{[10]^{k+7}}+\frac{\left[\frac{(2)^4}{(3)^2}\right]}{[10]^{k+6}}+\frac{\left[(2)^6(5)^2\right]}{[10]^{k+7}}$$
$$+\frac{\left[\frac{(2)^4(5)}{(3)^3(11)}\right]}{[10]^{k+8}}+\frac{\left[\frac{(2)^4(5)}{(3)^3(11)}\right]}{[10]^{k+9}}+\frac{\left[\frac{(5)}{(2)^6(3)^2(7)}\right]}{[10]^{k-10}}$$
$$=\frac{1\cdot((2)\cdot(5)^4)}{\alpha}=1.3703598\cdot 10^6$$

Sun
Mercury Venus Earth Moon
Mars Jupiter Saturn
Uranus Neptune Pluto
Parameter Number

Number [62] tends towards the numeric quantity, equal to a hierarchical scale of force, related to the alfa electronic constant with a fine structure, same as the overall interactive coupling parameter on an astrophysics scale of $10^4/\,\alpha$.
In other words, the quantum numbers of the SS represent, along with constant $C_{N/C}$,, a component of intensive curvature coupling, which generates the astrophysics bodies mediated through the curvature bosons $W_K^{\pm,0}$ In particular, said intensity is variable in the following two parametres : $C_{N/C}^{\frac{3}{4}}$ related to rocky planets , and $C_{N/C}^{\frac{7}{8}}$ related to the Sun and gaseous planets. Variable of $C_{N/C}$ spontaneously produces, in calculations, even in $W_K^{\pm,0}$ in corners of boson couplings cosines with the Sun's ray and gaseous planets if [60] is resolved compared to variable $C_{N/C}^{\frac{7}{8}}$ and by using the absolute value of matrix $\left|\mathbf{W}_{\alpha\beta}\right|$. The physics study of phenomenon [13]→ $\frac{r_{Planet}}{r_{K_{WK}}}\cdot\pi = n^{\circ}moon$. is therefore completed.

§5.5- Generational Sequence of Astrophysics bodies in the Solar System related to the Sun

We can begin our investigation which unites [53] with quantum numbers [63] related to the Sun

63)
$$W_K^{\pm,0}c^2\left\{\left[\frac{(2)^7(5)^3}{(3)^3}\right]\frac{1}{C_{N/C}^{\frac{7}{8}}\pi^6}\right\}=E_{Sun}$$

and study this energy comparing it to the energies at play, known by the planets and their satellites in the SS, in a unique relation which includes both the numerator and the denominator in the complete solar energy. To the numerator are the energies $W_K^{\pm,0}c^2$ of curvature bosons and to the denominator without curvature bosons, but with elettro-weak boson energies and neutrinos

64) $$\frac{W_K^{\pm,0} c^2 \left\{ \left[\frac{(2)^7 (5)^3}{(3)^3}\right] \frac{1}{C_{\frac{N}{C}}^{\frac{7}{8}} \pi^6} \right\}}{(E_{Sun} + \frac{1}{2E_{Mercury}+2E_{Venus}+2E_{Earth}+50E_{moon}} + \frac{1}{2E_{Mars}+2E_{Yupiter}+2E_{Saturn}} + \frac{1}{2E_{Uranus}+2E_{Neptune}+2E_{Pluto}} + \frac{1}{\sum_{k=1}^{3}(\nu_e,\nu_\mu,\nu_\tau)} + \frac{1}{E_{W_e} \cdot 10^{36})}} = 1$$

in which in the denominator , (except the energy of the Sun), the planet and the sun's energies are doubled (in virtue of virtual energy in the perturbative process ([6]) are moreover added those of standard bosons E_{W_e}, and those of neutrinos ν_e, ν_μ, ν_τ..

If we solve equation [64] compared to variables of any planetary energy, we obtain the following corresponding formula :

65) $$\frac{\sum E_{planet/c^2} - \left\{ \left[(2)^7 (5)^3 \, C_{\frac{N}{C}}^{\frac{1}{8}} \right] W_K^{\pm,0} \right\}}{\pi^6 C_{N/C}} = m_{one\ specific\ planet}$$

which shows the role of quantum numbers of the sun and the role of intensity among constants

66) $$\frac{C_{\frac{N}{C}}^{\frac{1}{8}}}{C_{\frac{N}{C}}} = \frac{1}{C_{\frac{N}{C}}^{\frac{7}{8}}}$$

in determining the coupling intensity value with bosons $W_K^{\pm,0}$ of curvature in order to generate the mass being searched for. The boson of curvature interaction with the Sun according to equation [65] generates (for Jupiter for example)

67) $$\frac{C_{\frac{N}{C}}^{\frac{7}{8}} \pi^6 \, m_{yupiter} - \left\{ \left[(2)^7 (5)^3 \, C_{\frac{N}{C}}^{\frac{1}{8}} \right] W_K^{\pm,0} \right\}}{\left[(2)^4 (3) (5)^4\right] 2\pi^7 C_{N/C}} = m_{Yupiter}$$

And the uniqueness of intensity [67] is shown by the existance of the following relation

68) $$\frac{\left[(2)^7 (5)^3\right] C_{N/C} \, \pi^6 \, m_{Sun}}{\left[(3)^3\right] C_{\frac{N}{C}}^{\frac{1}{8}} W_K^{\pm,0}} = 1$$

which comes from the solution of [67]. In a hydro-dynamic regime (post-explosive), the intensity of coupling of the boson curvature comes with the following constant electro-gravitational coupling values :

$C_{\frac{N}{C}}^{\frac{7}{8}}$ for gaseous planets;

$C_{\frac{N}{C}}^{\frac{6}{7}}$ for rocky planets;

69) $C_{N/C}$ for the Sun compared to planets;

$C_{\frac{N}{C}}^{\frac{1}{8}}$ for the curvature boson compared to planets;

$C_{\frac{N}{C}}^{\frac{7}{8}}$ for the curvature boson compared to the Sun;

$C_{\frac{N}{C}}^{\frac{7}{8}}$ for standard bosons compared to the curvature ones.

We believe it reasonable to deduct that parameters [69] of intensive coupling scale are due to various post-explosive states of matter : gasseous, mineralised, polverised referred to magnetic fields, atomic and molecular matter, which have been governed by the quantistic, aggregate, physics temporal-space described. The various evolutionary states of matter in the universe are linked to the intensity of homotopic transformations among the curvature and metric fields. These transformations necessarily involve curvature bosons and electronic decay, and which intensity is governed by the scale of constant coupling $C_{\frac{N}{C}}^{\frac{1}{2}} \rightarrow C_{\frac{N}{C}}^{\frac{1}{8}} \rightarrow C_{\frac{N}{C}}^{\frac{7}{8}}$. Such transformations are measured by a stop-watch which is placed on a limit of a contour condition of each spontaneous symmetry breaking between the local curvature field and the local metric field of Schwarzschild.

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