THE HYPOTHESIS AND THE EQUATIONS OF THE UNIFIED MATTER FIELD

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ABSTRACT

The purpose of this paper is to state the equations of the unified matter field which is derived from the hypothesis that any spacetime can be regarded as matter. Thus the unification of the GRT and the QM can be approximated, the operators of spacetime magnitudes can be stated and the matter field can be described - in a euclidean spacetime of reference- in its whole extent with spacetime wave functions. The charge space is regarded as an imaginary gravitational space which coexists with the real one, the two of them being interconnected. Thus a system of equations of space as a whole including the antimatter is stated and a possibility of application in the gravitation technology is showed. A verification is given through the fractal geometry which seems to apply in many matter systems characterized by the property of selfsimilarity.

INTRODUCTION

In the case that space and time are considered to correspond to the deeper reasons of reality a scientific formalism is insufficient and a philosophical quest is needed. According to the process through which Goedel's theorem is proved[1] we have the following statement "A": "There exists no system of axioms, those of logic included, represented in Peano's arithmetic , which will not lead into contradiction." Statement "A" is concluded on the basis of the axioms of "Principia Mathematica" [1,2], which codify the typical logic, and Peano's axioms which declare the existence of time since they claim the existence of "earlier" and "posterior". Time however implies space, since space must be the containing of any matter e.g. the containing of a time measuring system. If for reasons of communication consistency we claim the propriety of logic [3], statement "A" will constitute an application of logic in arithmetic and furthermore an application of logic in statements concerning space and time. The contradiction of statement "A" implies that space and time are not simply mental categories as Kant [4] believed, but they behave as reality itself. This leads us to the hypothesis that spacetime may be matter which really is uncertain. With this hypothesis as basis any infinitesimal spacetime behaves like a matter wave, which is - according to the spirit of this work - the basic concept of the unified matter field. It must be noted that there are many ways of approaching the unified field, as through the gauge theories, the superstring theory [5] and new axioms as the axiom of the unity of space -matter-time [6].

The present work is an extension of a previous one with title "The Hypothesis of the Unified Field and the Principles of its Dual Interpretation" [7]. This hypothesis can be stated through the following principles:

Principle I. In the whole extent of a matter field there does not exist any privileged area, and any spacetime of it contains energy due to the spacetime itself, which is matter.

According to the hitherto gained experience this principle can be stated as follows:
"Any infinitesimal spacetime can be regarded as a particle wave"

Principle II: In the whole extent of a particle field only those consequences of the GRT are valid which are compatible with principle I.

The only consequence of the GRT in the unified matter field is that [7]:

$$E = DE_0 \int tr dr^3$$

which is derived from the eqn:

$$dE = DE_0 dV_0 tr \quad \text{or} \quad dE / dE_0 = \tau / \tau_0 \tag{a}$$

where DE_0 the energy density, dV_0 the infinitesimal volume of the spacetime of reference to which dE corresponds, tr the relative time and τ the time of a phenomenon of comparison [7]. From eqn (a) we may notice that τ is equivalent with- i.e. it can measure- the energy dE of any oscillating spacetime element. Thus in the form of an axiom, which could be another expression of principle II, eqn (a) is stated as follows:
"The energy of any oscillating infinitesimal spacetime is equivalent to its internal time ".
where as internal time we call the mentioned time τ. This statement is not relativistic because it is not valid always for the mean value of relative volume. However it becomes relativistic for tr=const. which can be considered as valid for the eigenvalues of the spacetime magnitudes of any particle field, and for the case of any euclidean spacetime of reference.
Principle I leads to the following statements:

Statement I : A particle field can be described through a spacetime wave function which is identical with the particle wave function of the field.

Statement II : Any physical magnitude can be expressed, in a coordinate system of a euclidean space, both as a spacetime and as a quantum magnitude.
From principle I the following corollary holds:

Corollary I: The existence or the non existence of energy implies the existence or the non existence of spacetime, and consequently of any geometry.
The main conclusions of the mentioned hypothesis are:

1) In a particle field, relative time, relative volume and the square of the relative length (in a direction $\vec{n}$ with respect to the spacetime of reference with energy $E_0=m_0c^2$) have operators:

$$\hat{TR} = \frac{i\hbar}{E_0}\frac{\partial}{\partial t}, \quad \hat{VR} = -\frac{iE_0}{\hbar}\frac{1}{\partial/\partial t}, \quad (\hat{LR}_n)^2 = 1 - c^2\frac{\partial^2/\partial x_n{}^2}{\partial^2/\partial t^2} \tag{b}$$

2) The acceleration of gravity in a matter spacetime system is:

$$\vec{g}(r,t) = \frac{c^2}{P(r,t)}\nabla P(r,t) = \frac{c^2}{\overline{tr}(r,t)}\nabla \overline{tr}(r,t) \tag{c}$$

where P(r,t) the matter position probability density of the system. This eqn shows the unification of all forces since it is valid for all gravitational fields.

3) It is valid that:

$$E\langle V_E\rangle = hc \tag{d}$$

where E an energy eigenvalue of a gravitational particle field and $\langle V_E\rangle$ the mean value of the volume which contains this energy .

As spacetime of reference of a particle field we define a Euclidean spacetime to which through a coordinate transformation the field corresponds. This spacetime of reference is not only a geometrical notion, since according to the present hypothesis it is matter; any magnitude of it will be denoted by the subscript $_0$. A point A_0 of the spacetime of reference by the action of the field occupies a position $A \neq A_0$. Thus we have the transformation $A_0 \rightarrow A$ through the transformations $\chi^i \rightarrow \chi^{D^i} = f(\chi^i)$ which are not simply coordinate transformations but transformations of deformity. In this paper when we refer to description through a coordinate system of a euclidean spacetime of reference we mean the description through the transformations of deformity which apply to the euclidean spacetime of reference which has not been deformed by the action of the field. Any magnitude of the field eg. relative time or relative length in a direction $\vec{n}$, is described through a coordinate system of the spacetime of reference but corresponds to that point of the field which is defined through the transformations of deformity. Thus the statements I, II do apply, since the description of a particle field according to the QM is achieved by the aid of a ψ wave function through a coordinate system of a euclidean space which has not been deformed by the action of the field.

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As image of a field it is defined *the hypothetical field which consists of the reference spacetime at every point of which it is considered that the real characteristics of the corresponding, through the transformations of deformity, point of the field exist.* A relative spacetime magnitude according to statement II can be expressed also with quantum terms in the image of a particle field. For a relative-with respect to the spacetime of reference- spacetime magnitude $\overline{sr}$ by definition it is valid that:

$$\langle\overline{sr}\rangle = \frac{1}{V_0}\int \overline{sr}\ (r,t)dr^3$$

For the probability density it is valid that $\int P(r,t)dr^3 = 1$. Thus we will have:

$$\int P(r,t)\langle\overline{sr}\rangle dr^3 = \frac{1}{V_0}\int \overline{sr}\ (r,t)dr^3 \quad \text{and} \quad \overline{sr}(r,t) = \langle\overline{sr}\rangle V_0 P(r,t) \tag{1}$$

where $\overline{sr}(r,t)$ is the observable mean value of that magnitude at point (r,t) of the image of the field and V_0 the volume of the reference spacetime . Eqn (1) is compatible with corollary I according to which the existence or not of energy entails the existence or not of any geometry. In order for a complex relative magnitude to exist so that:

$$\sigma r(r,t) = c_{\sigma r}\psi \quad \text{and} \quad \overline{sr} = \delta_s|\sigma r|^2 \qquad \text{(statement I)}$$

it should be valid:

$$c_{\sigma r} = (\langle\overline{sr}\rangle V_o)^{1/2} \quad \text{and} \quad P(r,t) = \delta_s|\psi|^2$$

where $\delta_S = 1$ for matter and $\delta_S = -1$ for antimatter.
The possibility that a negative probability density exists will be shown later. In this case the angle between the real and the imaginary axis is not always equal to 90^0 and P is not restricted only to the form $\psi^*\psi$ or $\psi^+\psi$ [7]. That is possible because the factor that gives sense to the complex representation is the physical meaning of various magnitudes and not the complex representation itself. [7]. Thus it holds:

$$\sigma r = (\langle\overline{sr}\rangle V_o)^{1/2}\psi, \quad \tau r = (\langle\overline{tr}\rangle V_0)^{1/2}\psi, \quad \lambda r_n = (\langle\overline{lr_n}\rangle V_o)^{1/2}\psi$$

$$\text{and} \quad \overline{sr} = \delta_s|\sigma r|^2, \quad \overline{tr} = \delta_s|\tau r|^2, \quad \overline{lr_n} = \delta_s|\lambda r_n|^2 \tag{2}$$

where σr, τr, λr_n any complex spacetime relative magnitude, the complex relative time and the complex relative length in a direction $\vec{n}$ respectively.
The analysis which has been made in the spirit of this work [7] has showed that a particle field is possible to be described with spacetime terms. However there always exists a function ψ depending on a mass m. A more general description of space should be independent of any notion of mass. In a system with $\hbar = c = 1$, Schroedinger's eqn becomes:

$$\Box\psi = -m^2\psi \quad \text{and} \quad \frac{\Box\psi}{\psi} = -m^2 \quad \text{where} \quad \Box = \frac{\partial^2}{\partial t^2} - \nabla^2$$

and therefore:

$$\frac{\partial}{\partial x_i}\frac{\Box\psi}{\psi} = 0 \quad (i = 1,2,3,4) \qquad [3] \tag{3}$$

This eqn, according to principle I, will be valid also in the case of a many-bodies system in order to avoid any notion of a spacetime particularity. That means that spacetime is described anywhere by a unique equation. This holds on the condition that ? wave function is everywhere derivable but at the same time its partial derivatives are discontinuous; the latter implies that eqn (3) is valid in the neighbourhood of any point (r,t) but with a different m, which means that the generalized Ψ function locally describes a particle field. Fractal geometry, e.g. Koch's curve [8], can introduce us to discontinuous and derivable functions. Thus eqn (3) is valid in the whole extent of the image of any matter field and is determined by the imposed boundary conditions. However one may notice that eqn (3) does not take into account the potential which acts from a far distance. According to the present hypothesis there is not action from a far distance but action of space itself characterized by eqn (3). According to principle I, the local probability density P_i should have the same form as in the case of a particle field. Thus it should be valid that:

$$P_i(r,t) = (i/2m_i)\left(\psi^*\partial_t\psi - \psi\partial_t\psi^*\right)$$

Contrary to the fact that P_i, according to what has been accepted, cannot be considered as probability density, it can on the condition that P_i refers either to matter for $P_i > 0$ or to antimatter for $P_i < 0$. In that way the symbol P(r,t) of Schroedinger's relativistic eqn [9,10] can be regarded as probability density. According to eqn(c)(introduction) the above probability density creates a gravitational acceleration. Therefore eqn (3) describes any gravitational field completely. Since eqn(1) expresses a statistical identity, on condition that corollary I is valid, it generally applies to a matter system. On the basis that the generalized ? function locally describes a particle field, eqns (1), (2) it is possible in general to apply to any matter system. Thus eqn(3) is valid for the referred function:

$$\Gamma r(r,t) = \sigma r(r,t) / \left\langle \overline{sr} \right\rangle^{1/2} = V_0^{1/2}\psi \tag{4}$$

and in the case that $\left\langle \overline{sr} \right\rangle = \mathrm{const}$ for the function $\sigma r(r,t)$. *In this way it can be noted that the Ψ wave function has a different, than the presently accepted , significance i.e. it represents any referred complex relative spacetime magnitude of the image of the field that it describes.* Thus the generalized eqn which describes the geometry of any gravitational field is:

$$\frac{\partial}{\partial x_i}\frac{\Box \Gamma r}{\Gamma r} = 0 \quad (i = 1,2,3,4) \tag{5}$$

The issue then of what the difference is between the gravitational (g) and the electromagnetic (em) space arises, because according to this hypothesis they are both described in spacetime terms. The answer to that question can be given on the assumption that real space has not only our known dimensions but also dimensions that correspond to electromagnetism and to antimatter. Thus, every phenomenon can be described, under the same principles, in spacetime terms but through its relevant domain. Real space can be described through a coordinate matrix $\left(x_{gi}, x_{\overline{gi}}, x_{emi}, x_{\overline{emi}}\right)$ (i=1,2,3,4) where the symbol (–) corresponds to antimatter. This means that real space consist of four coexistent quantum spacetime gravitational fields i.e. the gravitational field (g), the antigravitational field $(\overline{g} \text{ or antig})$, the electromagnetic field (em) and the antielectromagnetic field $(\overline{em} \text{ or antiem})$.
Since those spaces coexist they are interconnected with a scale which we shall try to define.
As has been mentioned earlier eqn.(3) is the unique eqn of gravitational fields. This means that the SRT is valid on condition that its results are acceptable only through the QM. Because of principle II velocity c is the same in the (g) and the (em) reference spacetime and because of Lorentz's transformations it is valid:

$$\partial x_{gi} / \partial x_{emi} = \gamma \quad (i = 1,2,3,4) \tag{6}$$

where γ the correlation scale of (g) and (em) space. Upon the assumption that $\hbar_{em} = \hbar_g$ - which is found to be correct in the later- for particle fields it holds [9] that:

$$\Box_{em} + m_{em}^2 = \frac{\partial^2}{\partial t_{em}^2} - \nabla_{em}^2 + m_{em}^2 = \gamma^2\left(\frac{\partial^2}{\partial t_g^2} - \nabla_g^2\right) + k^2 m_g^2 = 0$$

Therefore the mass scale will be k=±γ. Taking into account the formulation of various physical magnitudes as mass, energy, force, constant G (for gravitational particle pairs it is valid: $G_{em}M_{em}m_{em} = G_g M_g m_g = \hbar c$ [7]) acceleration of gravity and constant $\hbar$, we obtain the following:

$$\tau_{em}/\tau_g = \gamma, \quad l_{em}/l_g = \gamma^{-1}, \quad m_{em}/m_g = E_{em}/E_g = \gamma,$$
$$F_{em}/F_g = \gamma^2, \quad G_{em}/G = 1/\gamma^2, \quad \vec{g}_{em}/\vec{g}_g = \gamma, \quad \hbar_{em} = \hbar_g \tag{7}$$

Thus the assumption that $\hbar_{em} = \hbar_g$ *is correct and it is noted that G is not the same for all gravitational spaces.* The same are valid in the case of $(\overline{g})$ space. Applying eqn (d) (introduction) to a pure gravitational field and to the energy levels of the atom of hydrogen [7] we obtain:

$$2\pi E_g r_g = hc, \quad 2\pi|E_{em}|r_g = \alpha hc \quad \Rightarrow \quad |E_{em}| = \alpha E_g \quad \text{and} \quad |\gamma| = \alpha$$

Because of eqns (6) γ should have the form: $\gamma=(1-v^2/c^2)^{-1/2}$. Given that $\alpha < 1$ we will also have that $\gamma < 1$. However this is valid only when $v > c$ and γ is an imaginary number. Thus it holds: $|\gamma|=\alpha$ and $\gamma=\pm i\alpha$. For $|\gamma|=1 \Rightarrow \gamma=\pm 1$ where the sign (–) corresponds to $(\overline{g})$ space. All these are compatible with the view that Schroedinger's eqn can have either real or imaginary eigenvalues [7]. Therefore we have the following correspondence:

$$\gamma = 1 \to g, \quad \gamma = -1 \to \overline{g}, \quad \gamma = i\alpha \to em, \quad \gamma = -i\alpha \to e\overline{m} \tag{8}$$

In the case that a (g) particle field coexists with an (em) it will be valid that:

$$i\hbar\partial\psi_g/\partial t_g = \langle E_g\rangle\psi_g, \quad i\hbar\partial\psi_{em}/\partial t_{em} = \langle E_{em}\rangle\psi_{em} \tag{9}$$

and because of eqns (6):

$$(i\alpha)i\hbar\partial\psi_{em}/\partial t_g = \langle E_{em}\rangle\psi_{em} \tag{10}$$

The energy mean value is independent of any position of the field and therefore its change is a function of time only. So taking into account the energy conservation principle, the fact that (em) energy is imaginary and eqns (9), (10) we have that:

$$\partial_{tg}(\langle E_g\rangle - i\langle E_{em}\rangle) = 0 \quad \text{and} \quad \partial_{tg}(\partial_{tg}\psi_g/\psi_g + i\alpha\partial_{tg}\psi_{em}/\psi_{em}) = 0 \tag{11}$$

Eqn (11) shows the connection between (g) and (em) space, and is valid at every point of the coexisting particle fields which describe a particle matter field as a whole. According to principle I , eqn(11) should be extended in the case of a matter system on condition that it is valid in the neighbourhood of (r,t) in the same manner as eqns (3), (5). Taking into account the gravitational nature of spaces and replacing the function Ψ with the referred function Γr, because of eqns(5), (6), (11) we have:

$$\partial x_{ig} \frac{\Box_g \Gamma r_g(r,t)}{\Gamma r_g} = 0, \quad \partial x_{ig} \frac{\Box_g \Gamma r_{em}(r,t)}{\Gamma r_{em}(r,t)} = 0, \quad (i = 1,2,3,4) \tag{12}$$

$$\partial_{tg}\left(\frac{\partial_{tg}\Gamma r_g(r,t)}{\Gamma r_g(r,t)} + i\alpha \frac{\partial_{tg}\Gamma r_{em}(r,t)}{\Gamma r_{em}(r,t)}\right) = 0 \tag{13}$$

where $\Gamma r_{em}(r,t)$ symbolizes the referred function of (em) space expressed in a coordinate system of (g) space. The local probability density, because of eqns (3), (4) will be:

$$P_i(r,t) = (i/(2(-\frac{\Box\psi}{\psi})^{1/2}))\left(\psi^*\partial_t\psi - \psi\partial_t\psi^*\right) = \frac{1}{2V_0}\left(\frac{\Gamma r}{\Box\Gamma r}\right)^{1/2}\left(\Gamma r^*\partial_t\Gamma r - \Gamma r\partial_t\Gamma r^*\right) \tag{14}$$

Since eqn(1) expresses a statistical identity, on condition that corollary I is valid, it generally applies to a matter system. Thus we have:

$$\overline{sr} = \langle\overline{sr}\rangle_i V_0 P_i(r,t) = \langle\overline{sr}\rangle V_0 P(r,t) \tag{15}$$

where $\langle\overline{sr}\rangle_i$, P_i refer to local particles and $\langle\overline{sr}\rangle$, P to the matter system as a whole.

Observable magnitudes can be derived with the aid of eqns (14), (15). According to what has been mentioned, eqn (15) is valid for all gravitational fields i.e. for $(g, \overline{g})$ and $(em, \overline{em})$ spaces. The mean value $\langle\overline{sr}\rangle_i$ can be calculated with the aid of the spacetime operators and the aid of statement II. However this calculation is beyond the scope of this work and could be the subject of a new paper. Taking into account the definition of the image of the field and that relative time and a relative length are defined both as quantum and as spacetime magnitudes (statement II) we obtain:

$$\overline{tr}(r,t) = \left.\frac{dt}{d\bar{t}(r,t)}\right|_{r=const}, \quad \overline{lr}_n(r.t) = \left.\frac{dx_n}{d\overline{x}_n(r.t)}\right|_{t=const} \tag{16}$$

$$\text{and} \quad \bar{t}(r,t) = \int_0^t \frac{dt}{\overline{tr}(r,t)}, \quad \overline{x}_n(r.t) = \int_0^{x_n} \frac{dx_n}{\overline{lr}_n(r.t)} \tag{17}$$

Eqns (12) to (16) and (a) to (d) (introduction), constitute the proposed system of eqns of the image of the unified matter field i.e. of ***the image of the quantum-spacetime****. Eqns (17) define the transformations of mean deformity of the unified matter field.* The above transformations do not describe a spacetime continuum and therefore they cannot apply in the GRT [11,12].

VERIFICATION

1) From eqns (7) we have that:

$$m_{\overline{g}}g_{\overline{g}} / m_g g_g = 1, \; m_{em}g_{em} / m_g g_g = -\alpha^2, \; m_{em}g_{\overline{em}} / m_g g_g = \alpha^2,$$

$$m_{\overline{em}}g_{em} / m_g g_g = \alpha^2, \; m_{\overline{em}}g_{\overline{em}} / m_g g_g = -\alpha^2$$

From the above relations it is noted that: a) the gravitational force of $(\overline{g})$ space has the same direction with the one of (g) space which means that the action of antimatter is not opposed to gravity. b) considering the negative load as (em) space and the positive one as $(e\overline{m})$ it is confirmed the common verification that oppositely charged loads attract each other while similarly charged repel. With these as basis and taking into account the interpretation of probability density of Schroedinger's relativistic eqn we see that for the case of cooperated oppositely charged loads (e.g. loads in the atom of hydrogen) we can observe the distinction between matter and antimatter. According to the spirit of this work the same are expected for the case of $(\overline{g})$ and (g) spaces.

2) Due to the statistical nature of space, from eqn (15) we have:

$$\overline{sr} = \langle\overline{sr}\rangle V_0 P(r,t) = \langle\overline{sr}\rangle_k V_k P_k(r,t), \quad \int P_k(r,t)dr^3 = 1$$

where k indicates any region around (r,t) and P_k the renormalized probability density the region considered as a whole. Thus in the case of relative length in two accidental directions $\vec{n}_1, \vec{n}_2$ it is valid that:

$$\frac{\overline{lrn_1}(r,t)}{\overline{lrn_2}(r,t)} = \frac{\overline{d\ln_1}}{\overline{d\ln_2}} = \frac{\langle\overline{lrn_1}\rangle_K}{\langle\overline{lrn_2}\rangle_K} = \frac{\langle\overline{lrn_1}\rangle}{\langle\overline{lrn_2}\rangle} \qquad [3]$$

where $\overline{d\ln_1}, \overline{d\ln_2}$ the mean real infinitesimal lengths in the directions $\vec{n}_1$ and $\vec{n}_2$ respectively, corresponding to the same infinitesimal length of the reference spacetime, at any point in the field. The above relation expresses selfsimilarity of a particle field at time t in the whole of its extent, and in the case that P(r,t) expresses a matter probability density , a relation of selfsimilarity of a matter system in general. This selfsimilarity constitutes a strict geometrical relation in the infinitesimal scale while it constitutes a trend in every scale k being compatible with fractal geometry [8,13] . The latter is a geometry of nature and has been already applied in various matter systems. From what it has been mentioned it is obvious that the compatibility of the quantum spacetime structure of matter with fractal geometry consists a confirmation of the present hypothesis of the unified matter filed. With these as basis the question is whether the mean geometry of the unified matter field is fractal geometry according to the meaning that B.B. Mandelbrot [13] attributes to it. Perhaps, we can reach to the fractal geometry through Riemann's geometry when as the fourth dimension we consider the fraction (c'/c) of the dimension of time, that is essentially the *timevelocity* [3], where c' the local velocity of light. The fact that this velocity is not constant in a matter system has been confirmed experimentally [14,15] while observations of the behaviour of electrons in magnetic fields have lead P.Beckmann [16] to the conclusion that the speed of light is constant in reference to the dominant filed and not to the observer.

DISCUSSION

1. Applying principle II for two plain spacetimes containing energies E_0, mc^2 respectively we have that the relative length of these spaces is E_0/mc^2. Therefore it is expected that the operator of the relative length (in a direction $\vec{n}$ with respect to the space time of reference with energy $E_0 \neq mc^2$) will be:

$$\hat{LR}_n = \left(1 - c^2 \frac{\partial^2 / \partial x_n{}^2}{\partial^2 / \partial t^2}\right)^{1/2} \cdot \frac{E_0}{mc^2}$$

The significance of the operators of eqns(b)(introduction) together with the present elucidation becomes clear through statement II given that with this principle as basis it is possible to derive quantum expressions for the local magnitudes of the relative time, volume and length. *Through the use of these operators we can solve the problem of the quantum-spacetime geometry on condition that Ψ wave function is known from the QM.*

2. According to the present work interaction of spaces $(em),(e\overline{m})$ is possible in the case of an electron rotating around a proton. Interaction however means coexistence and coexistence of (em), $(e\overline{m})$ spaces means gradual charge annihilation and radiation which, finally may lead to the entire disappearance of these charges something that is not happening. Therefore the following question is posed: where from comes the energy which replaces this gradual disappearance ? From eqn. (d)(introduction) results that the energy is reduced when the volume is expanding. This is expected because in general the expansion of the particle fields is caused by the expansion of the Universe. Therefore according to the energy conservation principle it can be written: $dE_e + dE_g = 0$ and $Tds = \phi dE_e$ $(0 \leq \phi \leq 1)$ which shows that the gravitational energy loss (dE_g) because the expansion of the Universe is converted into (dE_e) a part of which is the radiation (Tds) . Given that (dE_g) is less than zero it is obvious that [3]: $dS \geq 0$.

Therefore using as basis the present hypothesis and based on the predominant view that the Universe is expanding, the second law is derived; this under certain conditions is possible to be locally invalid showing in that way the possibility of generating order [17]. In the case of deceleration of the electrons of an atom e.g. through proper magnetic fields a falling trend is expected that is an approach of (em) with $(e\overline{m})$ space, an increase in the rate of annihilation-radiation, an increase in the rate of replacement from the gravitational space and a decrease of the energy of the surrounding gravitational space. Due to the equivalence of energy and time a decrease of relative time $\overline{tr}$ will be expected, according to eqn(a) (introduction), and because of eqn (c) (introduction) what is shown in Frg.1a will take place, that is the attraction on an object is attributed to the fact that the space under the object attracts the object more than the upper one and that $\overline{tr_2} > \overline{tr_1}$. If according to what was mentioned above succeed in having $\overline{tr_2}' < \overline{tr_1}$ then an ascending movement of the object will start as it is shown in Fig.1b [3,7] which is the main purpose of the gravitation technology. All these may constitute a new myth for matter and for spacetime, however these are stated here because they are in agreement with the spirit of this work offering to this a possible passage to verification.

$$
\begin{array}{cc}
\overline{tr}_1 & \overline{tr}_1 \\
\Downarrow & \Uparrow \\
\overline{tr}_2 & \overline{tr'}_2 \\
\overline{tr}_2 > \overline{tr}_1 & \overline{tr'}_2 < \overline{tr}_1 \\
a. & b.
\end{array}
$$

Fig.1

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