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CONFRONTATION BETWEEN THE FREE FALL OF A FLUID AND GRAVITATION: IMPROVEMENT OF THE UNDERSTANDING OF QUANTIC GRAVITATION EVTD^2

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Abstract: *Electromagnetic primary (mother) wave (EMW) of the EVTD^2 entities theory allows some concepts on phenomena occurring during the free fall of a fluid (water, for example) [1]. The reduction of the water flow diameter is obvious during fall. In this context, through a very simple experience, was shown that some dimensions of falling fluid (diameter, height and volume) are representative for local gravitation. Extrapolating conveniently to "energetic fluid" of the vide, named substratum, we could refine the concept of free falling in vide.*
Key words: *free falling, quantic space-time, EVTD^2 theory, energetic substratum.*

1. INTRODUCTION

The originality of the study of a flow of water falling to check the value of the Earth's gravity has been proposed by Brodard Z. and Ghalayini I. of the lyceum Louis le Grand, in the physical Olympiad in 2009/2010 [1]. The article with the title "Mesure de l'accélération de la pesanteur, *g*" was posted on Internet. A very simple experimentation (fig. 1) is showed for the free falling of the water from a cock.
The measured values of the two diameters of the considered flow, of the height between them and of the volume of water drained into a determined period of time drive, by integrating the final relationship of this study, to the value of terrestrial *g*.
It is well known that the diameter of water flow in its free fall presents a progressive thinning.
Considered fluid mass is conserved during the fall (the speed is too low to consider the relativity effect) and to pass through a less diameter it is necessary to increase its speed, hence the acceleration, i.e. that of gravity.
It is to compensate the lack of knowledge of initial and final speeds of the water flow, that the measures, reported above, are done (fig. 1) using a digital camera.

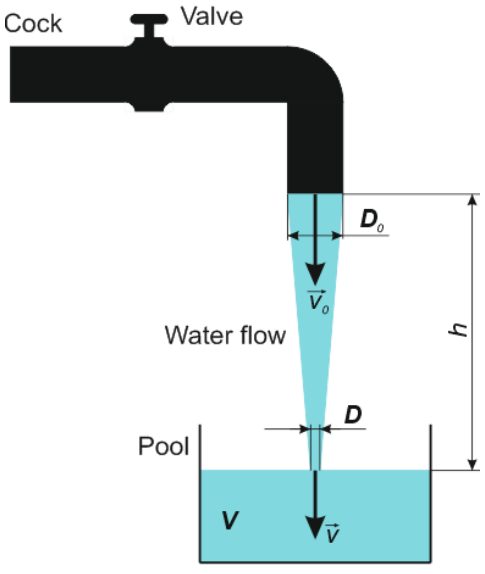

Fig. 1. Experiment on the water flow free falling.

To improve the understanding of the bodies' free fall in EVTD^2 theory by analogy with the study on water free falling it would be desirable to review the concept of space-time in EVTD^2 in the introduction of the article [2], in the same issue of this journal. The quantic gravitation in EVTD^2 theory [3] was already described [4-7] as well as the bodies' free falling [8].

This means to take into consideration the compacting work of vibrating action of EMW on the substratum, which would be the constitutive energetic element of space-time free of condensed matter.

As the matter mass (through the $E=mc^2$ relationship) *is equivalent, globally, to an energy condensation,* results that the entire universe could be imaginative considered as a recipient containing a mixture of sand and gravel of different sizes which would be submitted to a general vibration.

Continuing the analysis, under the vibratory action of a wave, the mixture of different grains of rock will be tiered into strata, where the grain of comparable sizes gather in homogeneous areas.

In this analogy *matter rock, common constituent to sand and gravel, is comparable to the energy itself*, in its different concentrations (proportions of energy) following size grain in question. Under the action of EMW the trend, in this conception of the universe, is therefore to the clusters of particles and material objects in comparison with the energetic substratum that does not present a great energy density (condensed matter + pure energy).

This general concept to describe the gravitation as a global work and especially around the physical body (singularities from the substratum) whose respective masses cause interactions between them. But, more, by their high energetic densities, the bodies would produce in space a ranking of the energetic layers that would be descending with the distance to this mass poles and so, driving to equal potential gravitational curves.

We will therefore adapt terrestrial experimentation of water flow as to be possible to reproduce it imaginary on the Moon using data convention-nally known.

Then we will complete in transposing, the findings were found for this study [1], to the free fall of objects in vide, on the Earth and on the Moon, taking mostly in account the *energetic fluid of the vide that we called substratum.* [3-8]

2. CHARACTERISTICS OF THE FREE FALLING OF A FLUID ON THE EARTH AND ON THE MOON

Correlated with the communication [1] it is obvious that there is a difference of kinetic energy between two sections in the water flow, separated by the distance h (Fig. 1).

Neglecting the friction with the air, there is more than the labor of height (mg) acting on the system.

From [1] results, for the speeds (v_0 and v) of the considered constant mass in respective sections D_0 and D:

$$v^2 = 2gh + v_0^2 \tag{1}$$

The lack of knowledge on the speeds v_0 and v will be compensated by the use of water volumes V_0 and V flow during a period of time Δt through each respective section. Hence:

$$V_0 = \frac{\pi D_0^2}{4} \cdot v_0 \cdot \Delta t \text{, et } V = \frac{\pi D^2}{4} \cdot v \cdot \Delta t \,. \tag{2}$$

From the expression of density $\rho=m/V$, the constant mass, $m_0=m$ and equation (2):

$$\rho \frac{\pi D_0^2}{4} \cdot v_0 \cdot \Delta t = \rho \frac{\pi D^2}{4} \cdot v \cdot \Delta t \,, \tag{3}$$

$$\Rightarrow v = \frac{v_0 D_0^2}{D^2} \,. \tag{4}$$

Replacing in (1) v given by (4) we have:

$$v_0 = \sqrt{\frac{2gh}{D_0^4 / D^4 - 1}} \tag{5}$$

During the time *t,* through the section D_0 flows a mass of water $M = \rho \frac{\pi D_0^2}{4} \cdot v_0 \cdot t$ equal to the mass collected in the pool in the same period of time. Hence:

$$\rho \frac{\pi D_0}{4} \cdot v_0 \cdot t = \rho V \text{ , and } V = \frac{\pi D_0}{4} \cdot v_0 \cdot t . \quad (6)$$

It is very interesting to note that the density of the fluid is eliminated. Replacing the expression of v_0 given by (5) we get:

$$g = \frac{8\left(D_0^4 - D^4\right) V^2}{\pi^2 h \cdot t^2 \cdot D_0^4 D^4} . \quad (7)$$

Therefore, knowing the local value of *g* we fix a D_0 on the water flow and, according to the relation (7), we choose in a consistent manner the parameters *h* and *t*, there will be unknown only *D* and *V*. In the case when it would be possible to better approximate *V,* the only unknown to determine from (7) stays *D*. Results that *h* and *t* must be correlated.

There is a well known relation between them: $h=(1/2)\cdot gt^2$ corresponding to the distance in free falling with gravitation *g* travelled by a mass with speed zero at *t=0*. Considering a time *t=2 s,* the correspondent distance is *h=2g*. For example, on the Earth at the Equator, where g=9,78 $m \cdot s^{-2}$, *h* is 19,56 *m*.

Considering the great differences between the water flow diameters and the height, its thinning could be estimated in a first approximation as a truncated cone with sections with diameters D_0 and *D* and height *h*. The volume of this truncated cone is:

$$V = \frac{\pi}{12} h\left(D_0^2 + D^2 + D_0 D\right). \quad (8)$$

Replacing *V* in relation (7) we obtain:

$$g = \frac{h \cdot \left(D_0^4 - D^4\right)}{18\, t^2 \cdot D_0^4 \cdot D^4} \left(D_0^2 + D^2 + D_0 \cdot D\right)^2$$

and this drives to the general equation (9):

$$D^8 + 2D_0 D^7 + 3D_0^2 D^6 + 2D_0^3 D^5 + \frac{18gt^2}{h} D_0^4 D^4 - $$
$$- 2D_0^5 D^3 - 3D_0^6 D^2 - D_0^7 D - D_0^8 = 0. \quad (9)$$

For the case of the Earth, if we consider D_0=2 *cm*, *t*=2 *s* and *h*=19,56 *m*, the found value of *D* is: D_T=1,0806 *cm*.

Considering an analogue experiment on the Moon, where g_L=1,62 $m \cdot s^{-2}$, the equation (9) is the same and for D_0 and *t* adopted in the same conditions as on the Earth, h_L=3,24 *m*. According to the equation (9), a similar value is found $D_T=D_L$=1,0809 *cm,* results that at first glance may seem astonishing.

If in a first approximation, the water flows are assimilated to truncated cones, then this two geometrical figures have identical diameters and are different only by their heights.

The respective water volumes defined for the two thought experiments, according to (8) will be:

$$V_T = 3{,}754 \cdot 10^{-3}\, m^3 \text{ , } V_L = 6{,}218 \cdot 10^{-4}\, m^3 . \quad (10)$$

The heights *h* of the two truncated cones have been chosen in direct link with gravitational accelerations g_T and g_L and it is normal to find for the volumes ratio the same value:

$$\frac{V_T}{V_L} = \frac{g_T}{g_L} = 6{,}037 \quad (11)$$

The results of real experiments in Paris given in [1] are for the value g_T=9,9 $m \cdot s^{-2}$ for approximately 9,81 ms^{-2}, what seems appropriate with regard to the uncertainties of the measures for sections, height and the volume of water.

The only question that remains, in this case, is the level of exact influence of the air resistance on the real thinning of the edges of the fluid to the centre of flow, where there is no air friction of the continuous jet.

Nevertheless this possible impact seems very little comparable to the fall of a rigid body. Indeed, here, the friction of the air is

significantly reduced because the fall is channeled continuously, which greatly removes the influence of the air in this scheme.
To determine the side volumes of each trunks around central fluid volumes which are cylindrical in shape of diameter D and respective lengths h_T and h_L (Fig. 2) it must subtract from the global volume of the truncate cone the volume of its central cylinder. The obtained lateral volumes are:

V_{lT}=19,5914·10^{-4} *m*, V_{lL}=3,2449·10^{-4} *m*.

It is possible to calculate the respective percentages of the lateral volumes of trunks of cone from each of their global volume and, this gives an identical value:

$$\frac{V_{lT}}{V_{ccT}} = \frac{V_{lL}}{V_{ccL}} = 52{,}187\ \%\ .$$

In both cases (on the Earth and on the Moon) there is the same percentage of lateral compaction in each assimilations in truncated cone, which means that there is identity of the report of homogeneity of active physical phenomena in these free falls during the same time.
Therefore if we compare the respective water flow thinning on Earth and on Moon, illustrated in figure 2, we note that the respective angles α_T and α_L are in the inverse ratio of respective gravities.

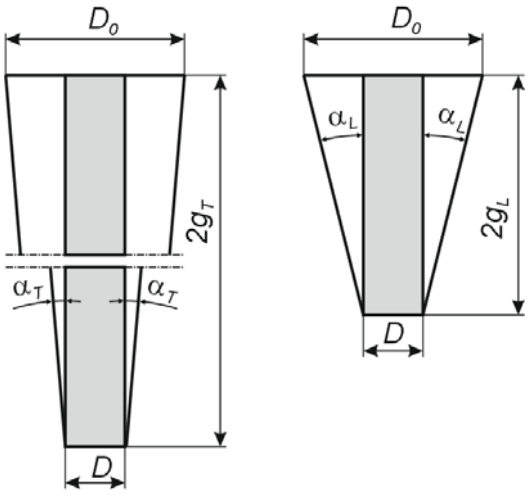

Fig. 2. Truncated cones geometry of water flows on the Earth and on the Moon

Here are equal values D_T=D_L=D and the angles

$$\alpha_T = Arctg\frac{D_0 - D}{2h_T}, \qquad \alpha_L = Arctg\frac{D_0 - D}{2h_L}$$

with their calculated values (expressed in degrees) a_T=2,349·10^{-4}, and a_L=1,14183·10^{-3}. The ratio of the two angles is inverse to the ratio of g: $\alpha_L / \alpha_T = g_L / g_T = 6{,}037$, which is to affirm that *lateral compaction of water flow is, in adopted hypothesis and in angular manner, 6,037 time more efficient on the Moon in comparison with the Earth, during the same time period. This is a major finding, which result in this type of experimentation and hypothesis, wherefrom it follows the question:* ***what are the phenomena that occur in the case of acceleration while they are not apparent in the case of uniform speeds or immobility?*** It seems that the effects of these phenomena could be somehow stabilized for fluids in movement with uniform speeds (homogenous flow sections). But, for fluids in accelerated movements, the sections' thinning can be explained in connection with a physical value linked with the phenomenon of free falling.
It seems logical to assume that the physical quantity in question may be growing instant speed that take in falling water drops. But here the question is: variation of thinning, in reality, is either linear (water flow in the form of truncated cone), or other form of profile curve. For the look of the profile of real thinning experimentation must be redone taking this time many more measures of the various sections of the net of water on the relevant height.
The curve of the profile can be comparable, in a second hypothesis, with a hyperbolic form i.e. "lateral compaction" is, then, more important at the beginning of fall (where the speed is low) that it is late fall where the speed of the water is the greatest. That is, it would be a thinning in deceleration over time.
One might think *that a natural phenomenon would act in the case of gravity, as for thinning (in deceleration that could be connected with the acceleration of g, by with instant speeds) of fluid flow in freefall*.

This could be understood, for this type of thinning, as a result depends on a certain frequency of compaction, uniform and universal, in a quantum mechanically defined space occupied by a very small mass of water for a very small time quantified. That is, for a low instant speed, longer travel time of the very small water quantity in quantified space in question, more active solicitations of compaction of the EMW wave and therefore a greater yield of thinning.
The reverse result occurs to the grandeur of the thinning, over time, when the speed becomes more important.
That is, the thinning performance decreases proportionately in free fall and the general profile of water flow is then organized in hyperbolic pseudo symmetry.

3. EXTRAPOLATION OF THE STUDY IN EVTD^2: TO SUBSTRATUM AND EMW

It is obvious that these experiences on the water flow cannot be made in a vacuum very pushed because of the water vaporization phenomena. In *the hypothesis where the friction of the air, on the edges of water, is not predominant on the thinning*, it seems logical, seen the correlations between the degrees of thinning and the effects of accelerations g_T and g_L, that *in the end: either the same phenomena that can cause these two simultaneous effects*.
A simplistic thinking queries us if one considers, for example, a very thin disk of water in the D_0 section, part of a water flow continuously falling, g is uniform for all considered water molecules, no notable effect of the air, all these molecules should fall vertically in a consistent manner, so without deformation of the section of the water jet.
Hence the question: ***what could be the understanding of this real thinning***? In EVTD^2 theory, gravity is generated by the compacting labor of EMW on intercalary energy substratum between the mass centers of bodies [4-8]. Specific areas of space-time where there is compaction, i.e. positive pressures on substratum, these generate the attractive effects of gravity: *this substratum compaction could be assimilated to the dark matter* that is, conventionally, yet enigmatic. In all other areas there are *negative pressures of substratum (dark energy)* which creates a repellent effect of gravity, [4-6], sending here, in fact, the expansion of the universe in such areas.
As to this theory, space-time is fully quantified in dimensions and time, thus, appears in the same logic, *if there is indeed compaction of energetic substratum in some areas by EMW structuring everything (space and matter), this could be done only in a quantum manner as in the image of the very essence of EMW*.
In the continuity of such assumptions, for a phenomenological understanding, it is normal to think that the density of energy substratum, on the Lunar soil is 6,037 times lower than the probable on the Earth soil, because of the respective gravitations (attractive to the masses and therefore energy because $E = mc^2$) following the hierarchy of the equal potential of gravity. From this point of view, it may seem reasonable to argue that the compaction on the axis of the centers of gravity of two material bodies cannot be initiated from a certain degree of compressibility suitable (which would be quantified gradients) in substratum in question.
Then it would be possible to involve, for example, the modulus of elasticity K for isostatic compression which is the inverse of the coefficient of compressibility χ_T whose thermodynamic definition relationship is:

$$\frac{1}{K} = \chi_T = -\frac{1}{V}\left(\frac{\partial V}{\partial P}\right)T \,. \qquad (12)$$

Thus, K is homogenous in pressure; indeed from the relationship of perfect gas $PV = nRT$, derived as $P\,dV+V\,dP=0$, it is possible to observe $\chi_T=1/P$, and therefore: $K=P$.
Trying to transpose the previous phenomenon of water flow free falling, by analogy, we can compare it with compaction of energetic substratum located under a material body falling in deep vacuum. It can, therefore, also be understood by this compaction analogous to flow to the ground of the fluid perfect substratum ***because its initial volume that has been compacted disappears as if it had flow, during the fall, being integrated completely in other EVTD^2 located down in the chronology of the fall***. By deductions from the theory of

EVTD^2 (isotropic space-time) it is inherent that compaction will be permanently and quantum way, for all three dimensions in a balanced manner.

On one hand, it will thus appear a multi compaction, on parallel directions to the ground all around the substratum fluid flow (underlying the mass) and on the other hand, internally to it, which will be vertically *and, it is the latter who, specifically, will generate the free fall of mass with which, by associations of energies, the substratum is closely related*. So, affecting one (substratum) it leads the other (mass): i.e. *vertical compaction of substratum, will result in mass movement on the same direction and orientation as the substratum to which it is intimately and strongly related*.

What seems interesting in this, is that we had already mentioned in the different [4-8] works on the quantum gravity in EVTD^2 about the vortex (of form pseudo hyperbolic) which would precisely be the volume form where the compaction work appears and resulting in the attraction of gravity. Indeed in [5], for the case of foresight attractive vortex in quantum gravity, they lie between the two considered masses.

Figure 3 reproduces a series of symmetrical envelopes (around the axis of mass centers of gravity) of vortex in the case of two masses *m* and *m'* in a report of *m/m'=3* and placed at a distance of 3 m.

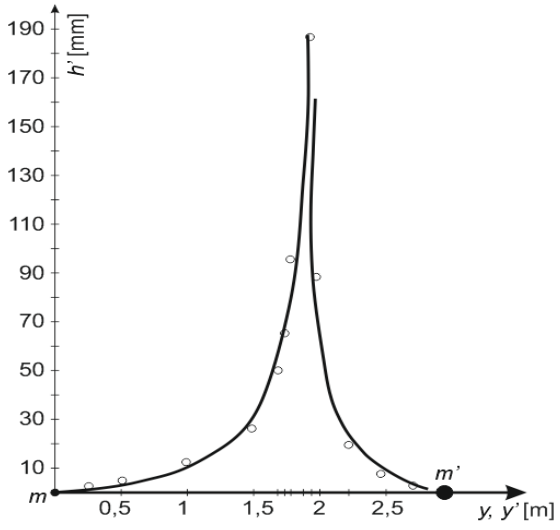

Fig. 3. Mono track of attractive vortex envelope between *m* and *m'* and his axis of symmetry *Oy* [5]

Was found in [5] the boundaries of vortex on two sides of the resulting zero equal potential at a distance of approximately 1,908 m of the mass *m*. It is to note (Fig. 3) that the two vortex are strongly, tangential and pseudo symmetric widening in rapport with resulted zero equal potential.

This seems to mean, if one adheres to the hypothesis of EMW causing a uniform 3D vibratory action in the space of universe, that differences in compaction effectiveness levels, for the same duration, depend on evolutionary values of a substratum characteristic.

Speaking of compaction, it cannot be other than a feature related to evolutionary compressibility suitable to *specific densities of this energetic environment, single occupant of any space-time free of any condensed matter*. By this understanding is inferred that substratum on lunar surface, is 6,037 times more difficult to compact than the one at ground level, which could be understood as resulting from different elasticity values. So, at the rate of EMW uniform labor, on the Moon will be necessary 6,037 times more solicitations unit pressure of compaction for a density similar to what happens on Earth. But the number of EMW solicitations is time constant. Indeed the stable EMW frequency is deter-mined by:

$$\frac{c}{L_P} = \frac{299792458}{1{,}616 \cdot 10^{-35}} = 1{,}8551513490 \cdot 10^{43}\ Hz,$$

where L_P is Planck's length. Happens then that on Moon, in comparison with the Earth, *the necessary "consumption of oscillations" for lateral and vertical compaction is 6,037 times greater than that needed on the Earth for the same time interval, i.e. the efficiency is 6,037 less on the Lunar soil*. In the same idea, one can try to take into account the stiffness *k* which expresses the general relationship of proportionality between the force *F* applied to a point and the resulting *x* deflection in this point: *k=F/x*.

The stiffness is also usable in traction - compression, as in shear. In a bar of constant section in traction - compression stiffness expresses on Young's modulus *E* is $k = \frac{A \cdot E}{L}$, where *A* is the surface of bar section and *L* is bar length. If the considered area *A* is the

section of an elementary EVTD^2 it will be equal to half of Planck length ($L_P/2$) to square, while the length L of the element is $L_P/2$ because the elementary entity is a cube of edge $L_P/2$. Thus, the expression of k is, here: $k = E \cdot \frac{L_P}{2}$/. The entities EVTD^2 on Earth and on Moon have almost same dimensions and thus the Young's modules of respective substratum densities are again related to the report of gravities, giving, by analogy, k_T=6,037·k_L. It is known that deformation energy E_{acc} in an element with stiffness k, for mono axial deformation x, is:

$$E_{acc} = \frac{1}{2} k x^2 = \frac{1}{2} \frac{F^2}{k} = \frac{1}{2} F \cdot x$$

Therefore, for the complete compression of an EVTD^2 in its neighbor, deformation x is $L_P/2$. Either: $E_{acc} = \frac{E}{2} x^3 = \frac{E}{2} \left(\frac{L_P}{2} \right)^3 = \frac{1}{2} F \cdot \frac{L_P}{2}$, so for homologue Young modulus $E = F \left(\frac{2}{L_P} \right)^2$, with F being the force developed by EMW for total compression of an EVTD^2 entity in the volume of its neighbor. Thus, analogous to the stiffness of substratum on Earth and on Moon, is reached also, the conclusion that the respective Young modules are related by E_T=6,037·E_L.

Planck deduced from his work, on black body emission that the energy carried by electromagnetic radiation was quantized and function of wave frequency ν and of Planck quantum h in value h=6,62606876·10^{-34} J·s by the relationship: $Energy = h \cdot \nu$. In our previous work [9] we have tried to refine the understanding of this quantification effect, especially for photons emission or rather for quantum electromagnetic effect (EE) of electrons in orbit around the atomic nucleus. This is, in theory EVTD^2, shocks impulses of the electron on entities of the orbit, which transmit these shock-pulses from one to its neighbor throughout the reporting path and, this to the speed of light c. EMW, being the wave that structures the space-time entities EVTD^2 then, it is likely the transported energy by this wave, respects the above relationship with its already set frequency: 1,855·10^{43} Hz. It is known that wave length of EMW consists of two integrated entities, and thus the energy h is corresponding to two entities; i.e. for every EVTD^2 the quantified unit energy is $h/2$. One can think that this must be equated to the accumulation of energy when an EVTD^2 is fully compressed, and it passes entirely in the entity which is immediately adjacent. It results, in the case of the Earth surface that accumulated energy by an entity is:

$$E_{acc} = \frac{h}{2} = \frac{E_T}{2} \left(\frac{L_P}{2} \right)^3 = \frac{1}{2} F_T \cdot \frac{L_P}{2},$$

Where from:

$$E_T = \frac{8h}{L_P^3} \text{ et } F_T = \frac{2h}{L_P}.$$

Thus, $E_T = \frac{F_T^3}{h^2}$, i.e. the necessary force to compress an entity in its neighbor, on Earth, is related by h to Young modulus of respective energetic substratum:

$$F_T = \sqrt[3]{h^2 \cdot E_T}\ .$$

It is therefore that, which has advocated above, Young modules respective to various densities of substratum, just as the compaction force by EMW, are quantified. Therefore, a major constancy *in the original organization* is found: *an unavoidable quantification in anything, especially in very small dimensions and in their phenomena, related to the total quantification of space-time and condensed matter, which is advocated in the theory of EVTD^2 entities*.

4 CONCEPTION OF THE STATE AND THE FLOW OF SUBSTRATUM THROUGH MASS IN FREE FALL

It is necessary in a new theory, such as that of EVTD^2 entities, to be in osmosis with the

characteristics and the bases of initial assumptions; more as the ultra fine study of considered phenomena in extremely small dimensions (those of Planck) supposes a very great and unusual abstraction effort in conception. Indeed, it is particularly necessary to take into account the proportion of the vacuum energy also in what concerns the large dimensions of the cosmos as those very small, less than the nucleons of the atomic nucleus.

It was demonstrated, for the space-time of a nucleon [10] and for cosmological space-time, that condensed matter represented only around 5% of the total volume, while there would be a unique 95% percentage: on one hand, for the whole matter and dark energies of the cosmos and on the other hand, also in nearby proportion, to the vacuum energy component of a nucleon consisting of quarks related by gluons.

It appears therefore that condensed matter would, at least in these two (very different in their dimensions) considered scales, be constituted at least 95% of vacuum energy. In the theory of EVTD^2 entities, the vacuum energy represents a global space-time, which, following scales, is occupied at least 95% of energy substrate.

This indicates a perfect homogeneity and homothetic organization of the "fill", of various scales of space-time, by the different dimensions of the condensed matter which is currently appreciated by our knowledge and means of investigation. *The remaining 5% are certainly occupied by condensed matter in which shall be, itself, still many vacuum*.

Then, it is possible to extrapolate this to the vicinity of the dimension of Planck; which would be to apply that what we call matter would be mainly constituted by an agglomerate, ultimately, slightly less than 100% of substratum energy.

That is, strictly speaking, the representation of a sum of energies of different more or less high levels, according to the different types of structural states of matter. This is accredited by the enormous energy developed in a nuclear explosion in which, *what we define as mass state turns into phenomenal energy*.

But there is also the knowledge that some cosmic rays can pass through very large amounts of condensed matter without being stopped; as if for them the matter was enough white, avoiding thus to meet the least tiny particle which could absorb. From there, we can represent very small dimensions of the material as a reduction of the cosmos to the corresponding scale with many vide spacing strongly the tiny constituent particles (quarks for our days).

Thus, the networks of EVTD^2 entities consisting only by energetic substratum virtually form continuity, dotted with a few physical material singularities, widely spaced.

Returning now to the free fall of bodies, following an empty air path, in fact one must imagine, the flow of particles (related and strengthened between them by forces) constituting the condensed matter, in the pseudo energetic fluid, extremely tenuous, called substratum.

Above, in this work, we suggested the idea that substratum between Earth and the mass in free falling was compacted to induce this vertical movement. But then it must be conceded that concentrations of substrate will give locally too large and disparate densities (in comparison with the environment): what should initiate dissemination of substratum in other EVTD^2 around the path.

Therefore, why not, *in and through the networks of EVTD^2 of the mass during its free falling,* knowing that the frequency of EMW is about 10^{43} Hz, which leaves the time to complete certain actions, in the relative low speed fall.

The initial phase of the phenomenon could be understood as a beginning of compaction of substratum by the work of EMW, in the EVTD^2 entities of vortex particular for the falling mass, and specifically in the entities in immediate vicinity of the resulting zero equal potential (Fig. 3).

Because of the great difference between the two specific mass, this zero potential must be positioned very closely to the masse center of falling body.

This would have *the effect of creating a relative pressure in this area of substratum* and this one

will have the trend to flow through the network of $EVTD^2$ in interior of mass and to top, promoting in fact, the movement down as thrust, by reaction, of a thus oriented rocket engine. This hypothesis is the opposite to the advocated above direction of substratum flow, but it does not alter the phenomenon.
The efficiency of substratum compaction in the attractive vortex of the Earth from the zero resulting potential appears to be less than the previous: since in this approach the excessively large mass of the Earth in report causes not own movement due to this significant gravity that is significant in this context. Therefore, it would be a less good possibility of flow for these substratum energetic density surplus, locally anachronistic, from the vicinity, in a reduced number of entities $EVTD^2$ during the free fall of the considered mass. Thus, can be considered that the insignificant gravitational motion of the Earth causes a species of buffer relatively to high densities of substratum flow to Earth. Accordingly, the latter directs it, as just was specified, to top i.e. in and through the mass, which induced the its free falling.

5 CONCLUSION

Through this last approach of free fall, in the theory of $EVTD^2$ entities, it is possible to imagine more finely this gravitational phenomenon from the vibrating EMW work.
These permanent couplings of animation will give the result of gathering together the masses (agglomerate of energy since $E = mc^2$) in respect with energy levels of energetic substratum formatted by the material conditions and the four fundamental forces at work in the various dimensions of space-time.
Thus, a mass may be shown in its intimate dimensions, as the very spaced assemblage of particles connected by trusses of substratum more or less dense (matter and dark energy) in accord with the actions of the four forces.
Due to its constitution essentially from energetic substratum, the moving mass “flows” easily through the space-time filled by a parfait fluid: the energetic substratum, the essential element of the universe.

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Paralelă între căderea liberă a unui fluid şi gravitație: ameliorarea înțelegerii gravitației cuantice EVTD^2

Rezumat: Unda primară electromagnetică (OME) din teoria entităților EVTD^2 permite câteva emiterea câtorva observații asupra fenomenelor care se produc la căderea liberă a unui fluid (de exemplu, apa) [1]. Constatăm o subțiere a diametrului debitului de fluid în timpul căderii. În acest context, printr-un experiment foarte simplu, s-a demonstrat că anumite dimensiuni (diametre, înălțimea considerată şi volumul) ale fluidului care cade sunt reprezentative pentru valoarea accelerației gravitaționale locale. Printr-o extrapolare convenabilă la „fluidul energetic" al vidului, numit substratum, putem să rafinăm conceptul căderii libere cuantice în vid.

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