

**AN EXPLANATION OF THE BODIES’ FREE FALLING
BY THE QUANTA BIPOLAR GRAVITY THEORY OF EVT²**

Michel Conte
Institut National des Sciences Appliquées Lyon
20, Avenue Albert Einstein, 69021 Villeurbanne
France

Ileana Rosca
Transilvania University
29, Bd. Eroilor, 500036 Brasov
Romania

ABSTRACT

Our theory of entities EVT² (Energetic, Volume, Temporal, Dynamics and Deformable) represents a theory of “All” that we could name New Physics in its characteristics triple quantified simultaneously: in energy; space and time. It is an exceptional instrument to be used in explanations for so divers phenomena as these concerning the world from condensed matter to the Universe are. The problem of the bodies’ free falling exists from Galilee and seems to be, in present, explicable by these new theory of quanta double polar gravity (simultaneously attractive and repulsive). Through the notion of space – time’s deformation used in the new approach of gravity, the explanation of the uniform acceleration during the bodies’ free falling becomes very simple. This corresponds to the criterion of duality: on one side, the movement with uniform acceleration for all bodies and, on the other side; an equilibrium state rapidly established by antagonist actions - the variable attraction is equilibrated by the opposite sense variable repulsion if we take into account the proposed approach for gravity.

Keywords: gravity, quanta, and entity.

1. INTRODUCTION

The well known gravitational Newton's force as well as the poor understanding of the bodies’ free falling since Galilee, stood to science two great enigma that are not yet resolved presently. Albert Einstein with its general relativity tried to answer to the two enigma and especially to the first one, considering the gravitation not as a force but as a geometrical property of the all vide space – time curved in accord with the masses.

But, in this case another **enigma** is born: *the nothingness could it have a curved space – time, or could one take principally into account only the effects depending on a certain organization of the space correlate with the time* without considering the causes of these effects?

At the end of his life, Einstein advocated another way in research after understanding that it was a supplementary development in his theory **granting a privilege to the simplification of phenomenon and making as complicated as necessary the space - time.**

In order to give a more coherent image to the gravitation between electrically neutral masses (as it is so difficult to explain), the “All” theory, based on elementary indivisible entities EVT² (**Energetic, Volume, Temporal Dynamic and Deformable**) was elaborated and it arrived **to propose a quanta bipolar gravitation, that is in the same time attractive and repulsive** [1,2,5]. It makes possible to return in a certain manner to the restricted relativity as to consider some of its results concerning the respective elasticity of time and length. In comparison with the consequences of general relativity,

that means, taking into account only the constant speed movements, in Galilee bases the time and lengths revolve for a motionless viewer observing a high speed mobile. The external motionless viewer will see, internally to the constant speed moving body, the time passing more slowly. For the same case, by another experiment, the observed lengths will be contracted in the direction parallel to the movement. By a reciprocal reasoning, an observer placed internally to the considered moving body will view the space in front of it (for example, an astronaut coming towards the Earth) as decreasing length: mountains as knolls, hills as dunes etc.

Considering all above mentioned major consequences of the general and restraint relativity, without doing any hypothesis on the nature of space - time, it results that it is elastic and deformable as well as for the time of certain space dimensions and for the dimensions of the bodies being inside it. This consequence is true but not in the same manner for the accelerated or constant speed moving body and for a motionless observer placed externally to the mentioned body, which confirm the relativity of these situations in accord with the observing position.

The **second enigma** concerning the relative free fall could be enounced as: *well knowing that the curvature of space – time in relativity is different in accord with the mass value could we accept that very different mass bodies behave in same manner in function of this space – time?*

As the reconciliation of these points of view was not possible till now and, if it will exist a possibility to accede to, it will be by a third point of view. That means to make possible the other Einstein's strategy that he indicated without working on it: to simplify the most possible phenomenon even it will be necessary to complicate very much the space – time.

2. STUY OF BODIES' FALL BY QUANTA BIPOLAIRE GRAVITY THEORY OF EVTD²

It is quite evident in a new treatment of the gravitation approach that the principal question is in the superposed constitution of the space – time or, if we want, what do we place in the great and small spaces of the Universe and in condensed mater? A possible answer would be to give the next definition to all spaces: **the space – time (with multiple coordinates, if necessary) having quanta geometry as well as quantified energy repartitions a respectively variable.** It is proved that the curvature and the relativity of space – time are implicitly included, and we add in accord with them, the notion of **mass – energy density that would be the constitute of all spaces in quantified packs (initial and fundamental bricks) thus filling the ancient Ether as well as the space and the particles of condensed matter.** It is quite the notion of diffuse energy to be mostly used par the up to day physicists that are not following Einstein in this domain.

These indivisible fundamental bricks are, evidently, the EVTD² involving an energetic constitution if not a mass equivalence for the whole space. This already allows finding the notion of Newton's gravitation force less esoteric as the heavenly bodies are separated by and soak in an energetic medium mass equivalent. In it the supposed Newton's force can find a manner to be applied and to act and from the mechanic point of view nothing is in opposition because there is a continuum medium.

The fact to fill the space –time with energy will complicate it mathematically speaking, but already we simplify a reaction of the space – time on a material body as it is also mass - energy.

To give a chance to all these to exist, the spaces must not to be empty but it must be constituted from a continuum medium of something adapted to the phenomenon to be better explained.

To accomplish a physique explanation of bodies' free fall, we must add to the energetic constitution of the space a better adapted conception for the gravity, because the single fact to "fill" the space is not enough to explain the regularity and the same value of acceleration for every mass falling to Earth. The Gordian knot is in **the uniform accelerated movement for the very different mass bodies.**

It seems to have to exclude from any explanation of the phenomenon, the parameter describing the mass value and to be interested to have a geometrical problem not only concerning the mass but mostly the space – time itself that surrounds the mass and to be placed between the Earth and this mass.

The considered here space – time is the one coming from the two contributions. On one side, we have the result of combination between the mass effect of Earth in the position of the bodies' free experiment and the bodies' masses (initially in repose). On the other side, the generated effect during the simultaneous falls that puts the space – time in a situation **were one (or more) interaction(s) is**

(are) obligatorily developed as certain actions of the participant phenomenon are in equilibrium to produce an uniform accelerated movement.

The great novelty concerning the gravity, proposed by the EVTD² theory, is to consider it as succession of interactions of geometrical origin proper to the space – time to be quantified and, from where a bipolar character represented by simultaneous resultants attractive on one hand and repulsive on the other hand results [1,2]. The detailed study of this new gravity’s approach is particularly presented in [2,3,4]. It is resumed by the figure 1 presenting the attractive and propulsive - attractive vortex while in the whole space the variable intensity repulsion interaction is developing. This figure also presents in section the equivalent gravitational potential surfaces for every mass separately considered.

From the restraint and general theory of relativity, we must remember here that the condensed matter moving with a uniform speed deforms the space – time (in the direction of the movement) and more, if the body has an accelerated movement. On one hand, the state of free falling body’s surfaces must be considered, and on the other hand if someone is placed on the body, by the relativity theory, he could observe the state of the Earth’s surfaces.

Firstly, let us consider the case of an apple that could be approximated by a sphere as to make simpler the study and further we shall try to extrapolate it to less symmetrical body, as a feather for example.

In the very first moment of the fall, the equivalent gravitational potential surfaces of apple can be imagined as spheres. The next moments, apple’s surfaces considered as its own parts will be deformed as any other body in accord with the relativity theories: restraint and mostly, general. So, relative contraction of the body’s dimensions in the movement direction will occur (its equivalent gravitational potential surfaces also). This observation could be evident to a subject placed on the Earth if these equivalent gravitational potential surfaces should be visible. As it is question of acceleration, the curvature will be more important as one can observe on the figure 1. This effect mostly assigned to the space – time curvature by the fans of the relativity theory will be perceived as a consequence of curvature modifications by the EVTD² theory.

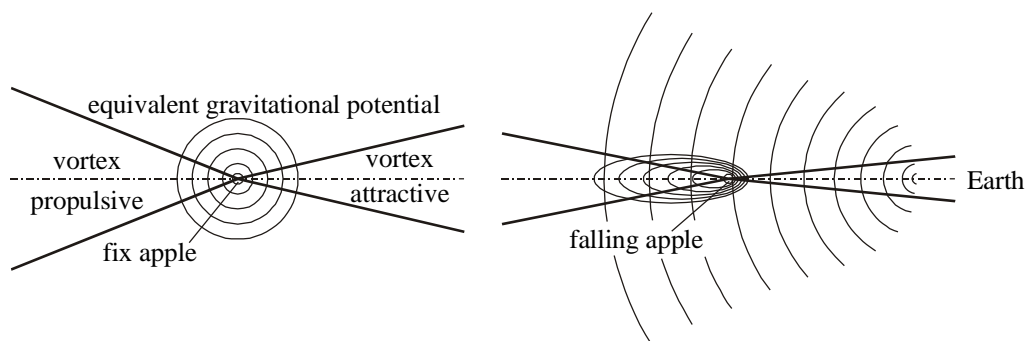


Figure 1. Spatial density and curvature evolution of the equivalent gravitational potential surfaces during the fall, decreasing the effect of attractive vortex and increasing the effect of the repulsive one till equilibrium.

It is shown that the relative contractions and the curvature’s modifications of the surfaces in the neighborhood of the vertical passing through the apple produce a greater curvature and their thicken between the apple and the soil. The new theory of quanta bipolar gravity devolved from the “All” theory [2,4] allows to do other consequences of the mentioned modifications in the case of free falling bodies in accord with haphazard study [2] in which the considered mass are fix or in movement with constant speed. From [2], the greater curvature in the proximity of the vertical and above the apple **will reduce the dimensions of the vortex in which act the interactions resulting from the reciprocal attraction between the masses and the propulsive interactions towards the Earth from the back of the apple.**

The dimensions of the vortex are in a certain manner dependant of the curvatures of equivalent gravitational potential surfaces corresponding to two masses as to ensure the uniform repartition of energy density in every Entity EVTD² [1,2,4]. This must be made in accord with “action quantum” of Henry Poincaré and with “phase extension” in the theorem of Liouville. Both of these actions, in fact

attractive, push the apple in its fall producing the acceleration of the approaching movement. Contrarily, **this situation will emphasize the decrease of considered attractive vortex's volume by increasing the curvature of respective surfaces.** This could be confirmed as a consequence of general relativity showing that, if acceleration increase, will curve more and more the space-time, what means more precisely the systems of EVTD² locally concerned by the apple fall. Such volume diminution of the attractive gravitational vortex between the Earth and the apple would have as immediate consequence on one side, the diminution of attractive affect in the very first moments of apple's free falling and, on the other side, the proportional increase of repulsive gravitational effect. It becomes that at the very beginning of the apple's free fall, the gravitational attraction will decrease rapidly and in the meantime the repulsive gravitation will increase nonlinearly till the moment when the equilibrium will be established between the two antagonist actions. **If this represents effectively the participant phenomena to the situation rapidly established it will state a stable situation: "the attractive action" pointing the soil cannot increase because it is braked by "the repulsive action" that points vertically up.** After all, **the phenomena evolution is preserved what means that they are fixed and drive to a constant acceleration that will be maintained till the end of apple's fall trajectory the one known to have an approximate value of 9,81 m/s² in the neighborhood of the Earth.**

The phenomena that occur at the beginning of the free fall can be excessively rapid because they must obey during their evolution to the light speed and it is necessary that the equilibrium between attraction and repulsion to be established rapidly for all forms of falling bodies.

Concerning the feather, everything is likewise and was said in the case of apple. Surely, it is most probable that the bodies' forms is not negligible in certain cases of gravitational effects and, then one must consider the proximity cases as for the force called of Casimir concerning two miniature parallel elements separated only by a distance of one nanometer. Its attractive component is influent and that could be explained by the EVTD² theory considering always the curvature of surfaces that could be now approximated with planes and not with spheres as before for round bodies.

3. CONCLUSION

In conclusion of this free fall explanation, partially by the general and restraint relativity theory and by the "All" theory based on entities EVTD², we must remember that from the point of view of certain analogies, the EVTD² system considers the curved space – time of Albert Einstein more completely because it would be furnished with energetic entities having quanta dimensions and being separated by quanta time intervals. To consider the gravitation as to be of quanta and bipolar nature allows to explain with a great scientific simplicity the rapid establishment of the equilibrium between antagonist attractive – repulsive gravitational effects for different masses and that permits the preservation of the stable state and the got acceleration's value.

4. REFERENCES

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