From the relative existence of electromagnetic field to its connection with the gravitational field.

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ABSTRACT:

The present document starts from the relative existence of the electromagnetic field, reaching through mental experiments to its connection with the gravitational field, without the necessity to resort to other space - time dimensions or supplementary "exotic" particles. The final conclusion is that the field "electro-gravitational" and electromagnetic field with accelerated source are two different manifestations of the same single field dynamic. Whilst demonstrating why there are light sources with "flee" towards the red or blue of the light spectrum.

CONTENTS:

As support for the theory set out in the title I have two other theories tested and accepted today, as follows:

1) – The electromagnetic field theory completely defined by the four Maxwell's equations, which state that, a variable electric or magnetic field (namely in accelerated motion) generate an electromagnetic field;

2) – The general relativity theory formulated by Albert Einstein who, starting from the local equivalent of a non-inertial reference system with a gravitational field, was able to generate the general principle of relativity, which states that all systems of reference are, in principle, equivalent between them (no matter the form of motion, rectilinear and uniform or accelerated). By which he meant that an event in a reference system must be seen as an event in all other reference systems (accelerated or not), it remains this way (namely an event) even if seen in a diverse form. (We have the example of the light which stays as a light beam, even if it has a shift towards a red or blue, colour depending only on how we move the observer).

(Furthermore, the equivalence principle says that an event (phenomenon) that can be carried out in a non-inertial reference system takes place in an inertial reference system located in a gravitational field (eg the Earth).

In order to better understand my reasoning, imagine an "U" Universe where there are only two observers - the "A" Observer placed in a box, equipped with various devices for testing and observation, together with an electric field (electrical charge jointly with floor box), and in another box the "B" observer with the same experimentation and observation apparatus, situated at a considerable distance from one another. The two observers communicate between them using two devices, which don't influence the experiment.

Initially, these two observers with their boxes, are at rest to one another.

By communicating between one and the other, they will have:

- Observer A to B: I observe (I detect) only an electric field in this universe.
- Observer B to A: I also observe only an electric field in this universe.

Consequently, the two observe only a single phenomenon in the whole universe - an electric field. Without a light source, they will not be able to see between them.

At a certain point, the box of the A observer begins to move with a constant acceleration towards the B observer (how, it moves it doesn't matter) (fig.1).

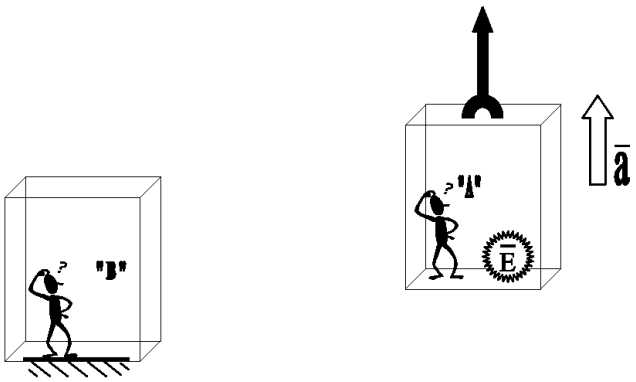

Fig.1

Observer "A" located in our box, feels a force (acceleration) directed "down" through the legs and if he lets different bodies from different masses to drop, observes that all bodies "fall down", all touching the floor box at the same time, no matter composite matter or physical state of the bodies in question, as Galileo concluded that happens in the gravitational field.

After a while (let's say ten seconds from the accelerated movement of box), the change of information between the two will be: -1).

- Observer B to A: - I don't know what you see, but for me things have changed and now I observe an electromagnetic field with accelerated source.

- Observer A to B: - And for me things have changed. Someone introduced me entirely with the box and electrical charge, in a field of acceleration. For this field of acceleration, I have two explanations:

-1). – The box in which I am (along with testing and observation appliances and electric field) is accelerated;

-2). -- I was introduced within the box in a gravity field.

The principle of equivalence says that I can't make a distinction between these two cases (1 and 2).

- Observer B to A: - If things are for you this way, it means that in order to explain the appearance of electromagnetic field with the accelerated source, the principle of equivalence makes that I also have two equivalent cases:

-1’). – The case in which your box is accelerated, a normal case (if an electric field is accelerated, it will radiate an electromagnetic field with the accelerated source);
- 2’). – The case in which you (box and electric field) have been introduced within a gravity field, a very interesting case. If you (together with the box and electric field) have been introduced within a gravity field, and I observe (I detect) the appearance of the electromagnetic field with the accelerated source, it means that this new field that I see, is actually the result of interactions between the electric field with the gravitational field. Therefore, I can say that an combined field of gravity with an electric field generates an electromagnetic field with the accelerated source. This means:

gravitational field + electric field = electromagnetic field with the accelerated source,
or: (**I.1**)
electromagnetic field with the accelerated source = gravitational field + electric field,

This represents " The Unification (Connection) Theory of the electromagnetic field with the gravitational field (U.T.E.F.G.), that can expressed like this:

When introducing an electric field in a gravitational field (acceleration field), an *electromagnetic field with accelerated source always appears*
or:

There is no method to distinguish between an electric field combined with a gravitational field (electro-gravitational field) and an electromagnetic field with accelerated source.

[One can say that the electro-gravitational field and electromagnetic field with accelerating source, are complementary - once you are inside of the electro - gravitational field a manifestation in a single strength is observed (i.e. split), and when you are outside you notice another way of the manifestation of the unique force. These events have a dual character, cannot be seen any time at the same time - the photon example].

This explains why under specific circumstances, gravitational field equations have almost the same form as those of the electromagnetic field. The two fields are different manifestations of the same single field.

Considering from acceleration ”**a**”, variation of the speed (Δv) tends to zero but never reaches zero and the variation of time (Δt) tends to infinity, for a short period the speed can be considered constant (and **a** =0) and U.T.E.F.G. changes into "E = vB “, this is Maxwell’s theory. This means that Maxwell's field theory is a special case of unification theory.

Mach claims that the acceleration "felt” by a body is due to the gravitational attraction exerted by all masses in the Universe on that body. That means that gravity "generates" acceleration - acceleration doesn’t exist without gravity. So the two cases (1 and 2) get down to one. Therefore, the case connected to gravity is the real case.

But, given the fact that there is equality, the terms on the left should describe the same thing as the right terms of the equality. So, to say that an assembly of gravity field with an electric field generates an electromagnetic field with accelerated source, is the same thing as admitting that you can’t make a distinction between combination of gravity field with an electric field (I named it electro-gravitational field) and (towards) an electromagnetic field with the accelerated source. Therefore the two fields are equivalent.

We can also se that an observer, who sees from the left side of the equality member (gravity field + electric field) doesn’t see from the right side of the equality (electromagnetic field with accelerated source).

To better understand that which is stated above, it is necessary to undertake another mental experiment:

We take a disk large enough to bear an X observer, who is anchored to said disk. This disk is equally divided in two colours - yellow and blue. Suspended somewhere above the disk, there is another Y observer, that sees the disk and the colours on it, but it doesn't see the X observer.

Initially, the two observations will be:

- observer X to Y - I see a disk divided in two colors, yellow and blue;
- observer X to Y - I see a disk divided in two colors, yellow and blue, which means seeing the same thing, blue + yellow = blue + yellow.

At one point the disk begins to rotate around the imaginary centre, and the two observations will be:

- observer X to Y - I see a disk divided in two colors, which I could see initially, but there has also appeared a field of acceleration, which I can feel;
- observer X to Y - I see a coloured disk in a single color - green. I think that I actually see the result of interactions between the field of acceleration and the two colours. This means that equality has changed and now we have blue + yellow (which we initially noticed) + field of acceleration (which you feel) = (generates) green (which I see).

Thus, the two say that blue + yellow + field of acceleration (mixture) generates green, but notice that one can say yellow + blue + field of acceleration (mixture) is equivalent to green. The two see the same thing but describe it differently (the same phenomenon described in two different ways). The same goes for us. We have two different ways of description of an electrical load located in an acceleration field (electrical load accelerated). On the one hand we describe an accelerated electrical load, and on the other hand, describe an electromagnetic field (which is actually the result of accelerated electrical loads). This is our relative interpretation; in fact the two descriptions refer to the same phenomenon.

T.R.R. tells us that space generates time.

T.G.R. says that a gravitational field is equivalent to a field of acceleration, but in the same time the theory says that field of acceleration generates a gravitational field and the gravitational field generates acceleration.

U.T.E.F.G. says electrical charge in a gravity field generates an electromagnetic field, but it also shows that the assembly of gravitational field with an electric field generates electromagnetic field with the accelerated source.

Since the equivalence between a field of acceleration and a gravitational field is local, this character is transmitted and U.T.E.F.G.

The same result (see **I.1**) can be reached with another experiment, as it follows:

A non-inertial reference system is locally equivalent to an inertial reference system located in a gravitational field. This is Einstein's equivalence principle which, placing on an equal footing the two reference systems (inertial and non-inertial) tells us that there is no experiment helping us to distinguish between them and that any event which can be observed in a part, will be observed in the other part as well (example of the curvature of light ray from fig.2, observed by both observers, "A" and "B").

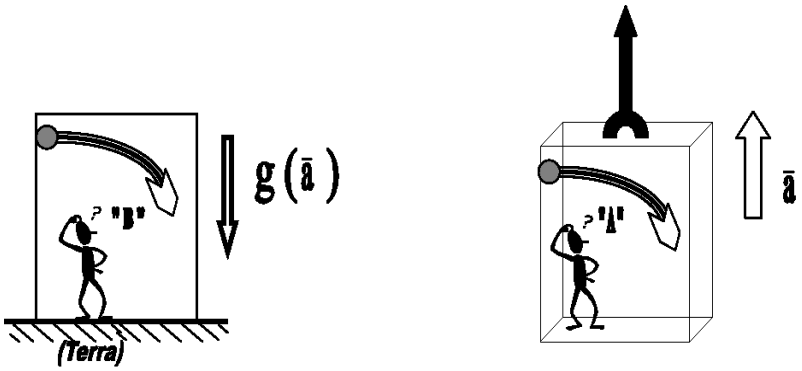

Fig.2

We take again the box that Einstein used in his examples, including the “A” observer and his apparatus of observation, far away from any type of influences. Outside of the box there is a stationary electric field (with its own reference system), as in fig. 3.

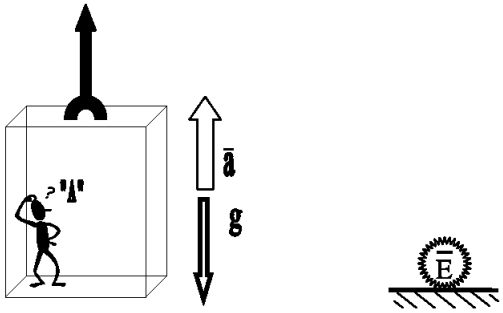

Fig.3

When the box is at rest towards electrical field, the “A” observer will realize only the presence of an electric field.

We will begin to move the box in accelerated way (“up") towards the reference system of the electrical field. Our observer from the box will have no way of knowing that it moves in an accelerated manner.

By gradually replacing the acceleration field with a gravitational field hi will not realize this change (not making any distinction between an acceleration field and a gravitational field) and hi will draw the following conclusion:

-when someone introduces me and integer my box to a gravitational field, the electrical field that I observe, disappears and in its place an electromagnetic field with accelerated source appears. So, gravitational field + electrical field = electromagnetic field with accelerated source, that is what we obtained earlier (see **I.1**).

This second experiment shows that the local equivalence existence makes that the “A” observer to “see” the same phenomena and when the acceleration field is gradually replaced by a gravitational field. If he could observe any slight change in the substitution of the two fields, then it could be possible to make a distinction between an acceleration field and gravitational field, what is in contradiction with the principle of local equivalence.

U.T.E.F.G. is one theory, which has visible effects only at cosmically level, it can explain why apparently some stars appear to be moving with a higher speed than the one calculated by Hubble's law (that means a shift of stellar light to the red light spectrum), but it also can explain and the shift of stellar light to the blue part of lights spectrum (aspect still remained unclear explained).

To explain the above - mentioned phenomenon, we take the example of two identically constructed boxes, but which have (as a value) different rates of accelerations, as in fig.4.

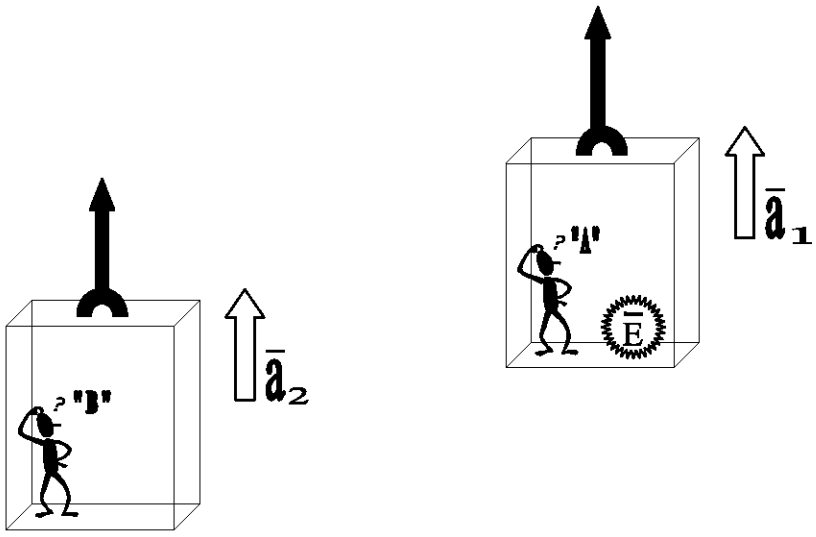

Fig.4

We introduce an electric field in box no. 1, which has inside "A" observer, and will draw the following conclusions:

- if $a_1 < a_2$, box no. 1 has one acceleration towards number 2 box about ($a_1 - a_2$), that is an negative acceleration and therefore "B" observer will note the presence of an electromagnetic field having a source with negative acceleration (namely the source is approaching), which means that the source field is a shift to blue;
- if $a_1 > a_2$, box no. 1 has one acceleration towards number 2 box about ($a_1 - a_2$), that is a positive acceleration and therefore "B" observer will note the presence of an electromagnetic field having a source with positive acceleration (namely the source gets away), which means that the source field is a shift to red;
- if $a_1 = a_2$, box no. 1 has one acceleration towards number 2 box about ($a_1 - a_2$), that is null acceleration and therefore "B" observer will note the same things like "A" observer, this means gravitational field + electrical field = electromagnetic field with zero accelerated source (namely multiplied by zero), resulting that it sees only gravitational field + electrical field; (how boxes have the same speed and the same direction, it is as if the two observers were be in the same box, and therefore they see the same thing).

As an accelerated reference system is locally equivalent with a gravitational field, our examples mentioned above can approximate with two gravitational fields of different value of intensities - see different accelerations of the two boxes fig.5.

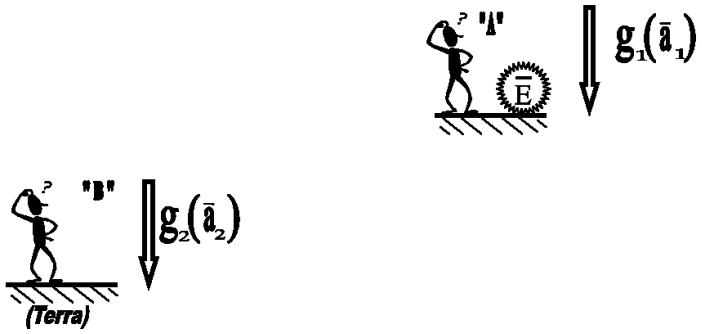

Fig.5

The box with "B" observer inside may be considered that is Earth whit our astronomers, and we have:

- if $a_1 < a_2$ (that is $g_1 < g_2$), terrestrial gravitational field intensity is greater than the source of the electromagnetic field and so we see the shift to blue;
- if $a_1 > a_2$ (that is $g_1 > g_2$), terrestrial gravitational field intensity is smaller than the source of the electromagnetic field and so we see the shift to red;
- if $a_1 = a_2$ (that is $g_1 = g_2$), terrestrial gravitational field intensity is equal to the source of the electromagnetic field and so we see two separate fields – electrical and gravitational.

This explains why we have few sources with shift lights (electromagnetic field shift) to blue (gravitational field intensity of the source is lower than terrestrial gravitational field intensity) and more sources with a lights shift to red (that is a gravitational field intensity higher than terrestrial).

U.T.E.F.G. not only gives us this beautiful explanation (demonstration), but it also represents, as one can see the mathematical part, the connection between Theories of general relativity (so-called relativistic classical mechanics) and quantum mechanics. This connection gives us a very interesting vision of the quantum world.

U.T.E.F.G. also explains very well the wave - particle duality, by actually link the electron (which has rest mass), with the photon (which has not rest mass).

In conclusion, one can say that from the assertion from two different observers (one in the gravity field and other outside influence), is inferred, that the electromagnetic field has a relative existence. The electromagnetic field and the electro-gravity are actually two different aspects of a single force. These two manifestations of this unique force have a dual and complementary character at the same time, they can’t be observed simultaneously. This theory succeeds in unifying the gravity field with the electromagnetic and it has the confirmation of the shift towards red or blue of the stellar lights, and **unifies the mechanical generalized relativity with quantum mechanics**.

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