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ABSOLUTE SPEEDS DETERMINED IN AN ENTIRELY QUANTIC SPACE-TIME BY ABSOLUTE DOPPLER-FIZEAU EFFECT

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Abstract: *The entirely quantic space-time structured by a primary electromagnetic wave that is considered in the theory of volumetric, temporal, dynamic and deformable entities, allows to consider determining absolute speeds. This implies an absolute Doppler-Fizeau effect and the consideration of own time felt by atomic watches jointly to mobile bodies. Further, a theoretical extension that will overcome the effects of relativity is developed relatively to the half-live duration of owns and radioactive elements, which would be dependent on variable inputs of vacuum energy in reverse correlation with their absolute speeds. But the speed of light bodies does not get extra energy.*

Key words: *Doppler-Fizeau effect; absolute speed reference; quantic space-time; live duration.*

1. INTRODUCTION

The theory ($EVTD^2$) of volumetric (V), temporal (T), dynamic (D) and deformable (D) entities (E) is principally based on the consideration of en entirely quantified in time and dimension space-time. [1-6]

A longitudinal primary high frequency electromagnetic wave (EMW), omnipresent in Universe, would structure cubic quanta with sides equal to the half of Planck length ($0.808 \cdot 10^{-35}$ m) and whom all inside points are in phase animated and thus temporally unified.

That means that if one point is submitted to an action, all other points in the same quanta are instantaneously under the same action.

As to generate some energy in a vibratory action, a substrate is necessary and, we called it substratum (better defined as the ancient Ether) which would be closer to the current dark matter and energy. [7]

In fact, taking into account the quantic and holographic gravity, for different localizations of $EVTD^2$, different positive and negative pressures exist in the considered space. [8-10]

Thus, gravitational attractions and repulsions result and, this allow explaining the accelerated galaxies expansion in Universe.

More, because of this quantic structure of space-time, it seems that photons speed (preferentially called here, *electromagnetic effect – EE*) would be quantified and, thus discontinue.

This mean light speed would be alternately decomposed, on one side, in instantaneous speed in each $EVTD^2$ and, on the other side, in staging moments at the end of its inside journey [11, 12] as to join the suitable phase in the

adjoining entity and to continue the propagation in the considered direction.

2. ABSOLUTE DOPPLER-FIZEAU EFFECT IN EVTD^2 SPACE-TIME

Let consider a specific mobile body for a representative, easy thought experiment having a particular length: the Planck's ($1.616 \cdot 10^{-35}$ m, which means two EVTD^2 and also, the wave length of EMW). It moves with the speed *v*. Any other body with any dimension could be analyzed here.

We can define, in analogy with Doppler-Fizeau effect, in a Galilean reference, which would be the frequency of this particular electromagnetic wave (in this case, EMW) caught and received by this mobile body (*v*) during a second.

Therefore, the emitting source of this wave EMW is assumed to be fixed and only the receiver is moving in the same manner as the emitted wave. The EMW is propagating with the constant light speed *c* on any direction and, especially, on the trajectory of the receiving body. The number f_{rec} of cycles that pass on this specific mobile receptor (*v*) at the end of a second will be:

$$f_{rec} = \frac{c - v}{1.616 \cdot 10^{-35}}. \qquad (1)$$

It is to be mentioned that for an immobile receiver or observer (i.e. the zero absolute speed reported to the light speed) the felt or received frequency is then equal to the EMW frequency (f_{EMW}):

$$f_{immobile\ rec} = f_{EMW} = \frac{c}{1.616 \cdot 10^{-35}}. \qquad (2)$$

If we introduce f_{EMW} (the frequency emitted by the considered source) in (1), we can write:

$$f_{rec} = \frac{c - v}{1.616 \cdot 10^{-35}} \cdot \frac{f_{EMW}}{f_{EMW}} = \frac{c - v}{f_{EMW}}, \qquad (3)$$

or,

$$f_{rec} = (1 - \beta) \cdot f_{EMW}, \text{ with } \beta = \frac{v}{c}, \qquad (4)$$

result in agreement with Galilean Doppler-Fizeau effect (when only the receiver is mobile in reference, $v_{emitter} = 0$)

$$f_{rec} = \frac{c - v_{rec}}{c} \cdot f_{emitter}. \qquad (5)$$

If we consider here the identity $f_{emitter} = f_{EMW}$, we shall find the corresponding result established in a Galilean reference. But more, it is possible to introduce a reference with absolute characteristics.

In fact, if we consider a source of the reference electromagnetic wave in the whole Universe (emitter of EMW *which can be fix or not because the emitted light is no more dependent on its source*), this structure of space-time (the EVTD^2) could represent a reference for the speeds of moving bodies.

It will exist as a base and a reference (absolute or pseudo absolute) using the knowledge of the frequencies that are received by these bodies during their displacements by report to the absolute point of the reference frequency of EMW propagating in the space-time empty of condensed matter. The base f_{EMW} would become pseudo absolute if we consider the EMW propagation in environments with refractive indices different from one. So, if a body is crossed by the full frequency of EMW (f_{EMW}) it will be immobile (absolute speed equal to zero) in report to light speed *c*, which means here, the EMW.

Therefore, the knowledge of the frequency received by a motionless or moving body allows to deduce through (2) its speed *v* in report to the absolute speed of light *c* in the space empty of condensed matter. From (2), it is possible to write the absolute speed *v:*

$$v = \frac{c\,(f_{EMW} - f_{rec})}{f_{EMW}} = c\,(1 - \delta), \qquad (6)$$

with: $\delta = \frac{f_{rec}}{f_{EMW}}$.

The extrapolation of these considerations for space-times in the vicinity or inside of condensed matter would take into account the possible variations of c in considered environments.

Thus, the single relativity of f_{rec} and further determined speeds will be effective only for comparisons between environments with different characteristics. In this case, the relevant differences will be for the light speed propagating in different environments.

On one side, there is an absolute length reference – the wave length of EMW (in vacuum and away from any mass), which means Planck length equal to $1.616 \cdot 10^{-35}$ and also, on the other side, a light speed reference in the same vacuum for all electromagnetic wave that is the value measured only on Earth: c = 299792458 m/s and allowed as constant for all propagation directions. It follows a reference frequency which is the EMW frequency, i.e.:

$$f_{EMW} = \frac{299792458}{1.616 \cdot 10^{-35}} = \\ = 185515134.90099 \cdot 10^{35}\ Hz. \tag{7}$$

The EMW period deduced from the frequency has the value:

$T_{EMW} = 1/\ f_{EMW} = 5.3903957784 \cdot 10^{-44}\ s$.

This value of EMW oscillation period in very close to the Planck's time $t_P = 5.390640 \cdot 10^{-44}\ s$, which is corresponding to the time reference of Universe because it is in correlation with the absolute references of all movement speeds. This is the time that governs the existence of all things or living beings in absolute stillness in report to this reference, just defined. *This therefore, join by analogy, taking account of an absolute repository of Newton: but here it is a repository of absolute velocities of the body in movement*.

But in the general case of absolute movements, the base of different times felt in this reference by the moving bodies with a certain absolute speed v (and thus, in Universe) will be obtain from (2) that becomes:

$$\frac{1}{T_{rec}} = \frac{c - v}{c \cdot T_{EMW}} = \frac{1 - \beta}{T_{EMW}} \Rightarrow \\ \Rightarrow T_{rec} = \frac{T_{EMW}}{1 - \beta} \tag{8}$$

It turns out, from the constancy, in all directions, of EMW speed in vacuum areas away from any mass, that the absolute space-time has its references for lengths (dimensions) and for received and felt time for all entities and elements in Universe, dependent on physical characteristics of considered environmental areas.

In (4) we can multiply the two members of equality by the speed c of electromagnetic waves:

$$c \cdot T_{rec} = \frac{c \cdot T_{EMW}}{1 - \beta}. \tag{9}$$

It then follows that the wavelengths corresponding to these frequencies, will be: $\lambda_{rec} = c \cdot T_{rec}$, and $\lambda_{EMW} = c \cdot T_{EMW}$. The relationship between the two wavelength is given through (9): $\lambda_{rec} = \frac{\lambda_{EMW}}{1 - \beta}$ and follows that $\lambda_{rec} \geq \lambda_{EMW}$, equality taking place when $v_{rec} = 0$, i.e. in absolute receiver immobility.

Otherwise the received wavelength is always greater than the wavelength of the EMW considered here as a reference.

We do not have current possibilities to measure frequencies of the order of f_{EMW} and its neighbors.

The determination of the time laps of the order of the Planck time (T_{OME} and T_{rec}) is not more feasible nowadays.

The biggest current time accuracy is provided by atomic clocks. It is known that differences in location and speed of these previously synchronized clocks, induce shifts in time that are measurable.

Actually, atomic clocks on Earth and in satellite placed on Earth orbits, they are in relative motion and absolute speeds that are often different. As their optimized operations depend on adjustment of frequency (micro waves)

emitted by an oscillator that initiates and guides the clock, it is possible that the superposition of EMW frequencies (felt differently on Earth and in space) could modify the system process of these clocks placed at different absolute speeds in the Universe.

Thus, the indicated time would be, then, naturally altered variously for two clocks that have been yet initially synchronized.

This is another manner to explain the causes of their own time offset, which is currently explained by the relativity and by the pressure and humidity differences, in communication between clocks on Earth and on space.

If the time offset of clocks moving with different speeds is proved to be connected homogeneously to received frequencies f_{rec} from EMW during their journey, it would be possible to use the further process to determine the absolute speeds in Universe of these clocks or of other bodies which would be equipped with them.

3. DETERMINING ABSOLUTE VELOCITIES IN UNIVERSE

Let us suppose two receivers 1 and 2 moving with different velocities, i.e. $v_1 > v_2$. As we already saw above, their respective perceptions of frequencies received from the OME also result in different periods (T_1 and T_2) for these received waves during the movement. We can therefore write respectively from the general relationship (8)

$$\begin{aligned} T_1 &= \frac{T_{EMW}}{1-\beta_1}; \\ &\quad , \\ T_2 &= \frac{T_{EMW}}{1-\beta_2}, \end{aligned} \qquad (10)$$

with $\beta_1 = \frac{v_1}{v}$, and $\beta_2 = \frac{v_2}{c}$.

The difference of the periods is:

$$T_1 - T_2 = T_{EMW}\,\frac{c(v_1 - v_2)}{(c - v_1)(c - v_2)}. \qquad (11)$$

It would be possible to determine the difference between two periods using two atomic horologes moving with absolute speeds v_1 and v_2, for example, on two spatial orbits different around the Earth as to be placed in a an almost identical environment concerning the gravity.

If, more, it is possible to determine the relative difference between the two absolute speeds of receptors clocks $v_1 - v_2$, what is usually quite easy, it would imply to use any of references but the same for both speeds.

It remains to calculate the intrinsic values of each of the two absolute speeds v_1 and v_2.

Therefore, if we have the possibility to determine $v_1 - v_2 = A\,\mathrm{km}\cdot\mathrm{s}^{-1}$, we could consider: $v_1 = A + v_2$ and from (11) it results:

$$T_1 - T_2 = \Delta T_{ref} = \frac{c \cdot A \cdot T_{EMW}}{(c - A - v_2)(c - v_2)}. \qquad (12)$$

Since T_{EMW}, A and c are known, it then leads to an equation of second degree in v_2 which is of the form:

$$\begin{aligned} &\Delta T v_2^2 + \Delta T(A - 2c)\cdot v_2 + \\ &\quad + c^2 \Delta T - cA(T_{EMW} + \Delta T) = 0. \end{aligned} \qquad (13)$$

But (8) can also be written as:

$$\frac{T_1 - T_2}{T_{EMW}} = \Delta T_{ref} = \frac{c \cdot A}{(c - A - v_2)(c - v_2)}. \qquad (14)$$

Thus the equation of the second degree in v_2 becomes:

$$\begin{aligned} &\Delta T_{ref} v_2^2 + \Delta T_{ref}(A - 2c)v_2 + \\ &\quad + c^2 \Delta T_{ref} - cA(1 + \Delta T_{ref}) = 0. \end{aligned} \qquad (15)$$

The solutions (absolute speed v_2) of these equation are, respectively:

$$v_2 = \frac{-\Delta T_{ref}\left(A-2c\right)-B}{2\cdot\Delta T_{ref}},$$
$$v_2 = \frac{-\Delta T_{ref}\left(A-2c\right)+B}{2\cdot\Delta T_{ref}}, \qquad [16]$$

where, B is:

$$B = \sqrt{\left[\Delta T_{ref}\left(A-2c\right)\right]^2 - 4c\Delta T_{ref}\left[c\Delta T_{ref} - A\left(1+\Delta T_{ref}\right)\right]}.$$

According to the studied case, one or the of the above mentioned solutions will be considered to find the v_1 value.

Thus the difference between the two own time or felt by each of moving bodies (atomic clocks) is calibrated or referenced to absolute time which is the period of EMW or the Planck time (t_P) because T_{EMW} and t_P are very close. The parameter ΔT_{ref} represents a difference (or a gap) between two analogous times (on the order of 10^{-44} s) and it is referenced by another time T_{EMW}, also analogous, which is a reference and absolute inside the theory of EVTD[2].

Therefore, we can consider the three time in the same base of time (different from the previous), which will induce a parameter ΔT_{ref} with an identical value as the previous case. We can take, for example, the second as the same unit of time and reference absolute time will be T_{EMW} = 1 s which impose to multiply every considered time T_2 and T_{EMW} by 10^{+44}.

Some opinions say that the absolute speed of the Earth in Universe would have the value 369 ± 10 Km/s according the considered semester. In order to verify the firs solution (16) we shall take into account an average value of 369 Km/s as absolute value of the Earth and its atomic clock.

Supposing an identical clock placed on an Earth orbit in a satellite at 27000 km altitude that rotates around Earth in one hour, it follows that the clock will have an average speed of 47.124 Km/s higher than that of the Earth, which means 416.124 Km/s. Knowing that the determination, by the previous relationships, of $\frac{T_1-T_2}{T_{EMW}} = \frac{\Delta T}{T_{EMW}} = \Delta T_{ref}$ with the value T_{EMW}=5.3903957784·10^{-44} s results in the value of the time gap relative to the two clocks, (10): $T_1 - T_2 = 8.49536614682676337\cdot 10^{-48}$ s.

This value would be consistent with the result of the theory being developed and it will serve as a check of the equation of the second degree in v_2, for example. Hence,

$\frac{T_1-T_2}{T_{EMW}} = \Delta T_{ref} == 1.5760189970298\cdot 10^{-4}$.

If, as suggested above, T_{EMW}, T_1 and T_2 will be multiplied by 10^{+44}, these times will be on order of one second and would follow that ΔT_{ref} will be connected to a temporal gap referenced in the range of one second.

Thus, $T_1 - T_2 = 8.495\ldots\cdot 10^{-4}$ s *may be the temporal gap per second that could be the value observed between the indication of the two clock in question*.

For purposes of verifications, regarding especially the mathematical validity of first equation (16), the time gap $T_1 - T_2 = 8.495\ldots\cdot 10^{-4}$ s and $A = 47124$ m/s will be introduced as the only data identified and defined in the problem in question.

Following the calculations of the two possibilities of speed v_2 (absolute speed of the clock on Earth) happens that only one is realistic and its obtained value $v_2 = 369$ Km/s confirm, at least the mathematical relationship (16) and which also induces the conform value $v_1 = 416.124$ Km/s (absolute value of the clock in satellite).

Therefore it remains to test as to establish if the physical theory used in this case study is realistic and in agreement with data of time recorded and measured gap between two atomic clocks placed in most similar possible environmental conditions (i.e. of the relatively close gravitational values to overcome effects of general relativity).

It might be considered the case of two clocks placed in space on two Earth orbits: for example, one geostationary (at an altitude of 35784,14 Km) and the other around 20200 Km altitude.

The speed of geostationary satellite on its orbit was calculated for 3.074 km/s. The speed of the other satellite, i.e. for GPS application is given as being very close to 14000 km/h = 3.889

km/s. The two mentioned speeds are relative to the reference of the Earth.
When calculating, the previous approach, various gaps between the indications of the three clocks (on Earth, in geostationary orbit and orbit GPS) yields the following intermediate results:
The three speeds in the universe to be considered would be, respectively:

$$v_T = 369 \text{ Km/s},$$
$$v_{Géo} = 372.074 \text{ Km/s } \alpha\nu\delta$$
$$v_{GPS} = 372.889 \text{ Km/s}.$$

The three frequencies received and felt by these clocks result from (5):

$$f_{recE} = 185286793.3168 \cdot 10^{35} \text{ Hz},$$
$$f_{recGéo} = 185284891.0891 \cdot 10^{35} \text{ Hz},$$
$$f_{recGPS} = 185284566.5335 \cdot 10^{35} Hz.$$

By (8) for the periods of EMW received and felt by each of the clocks:

$$T_{recE} = 5.39703873168147 \cdot 10^{-44} s,$$
$$T_{recGéo} = 5.397094140390922 \cdot 10^{-44} s,$$
$$T_{recGPS} = 5.39710394265067 \cdot 10^{-44} s.$$

Thus, for respective given time gaps of the three clocks from the periods received and processed, as above, on one second:

$$T_{recGéo} - T_{recE} = 55.40870945275 \cdot 10^{-50} s,$$
$$T_{recGPS} - T_{recE} = 65.210969203 \cdot 10^{-50} \text{ s},$$
$$T_{recGPS} - T_{recGéo} = 9.80225975025 \cdot 10^{-50} \text{ s}.$$

This allows to write:

$$(T_{recGéo} - T_{recE}) / T_{EMW} = 10.27915420882 \cdot 10^{-6},$$
$$(T_{recGPS} - T_{recE}) / T_{EMW} = 12.09762174872 \cdot 10^{-6}$$
$$(T_{recGPS} - T_{recGéo}) / T_{EMW} = 1.81846753990 \cdot 10^{-6}.$$

If one adopts, as has been mentioned above, an optional value (T_{EMW}, for example), concerning the previous mentioned gaps, it would be relative time differences between each clock, which would therefore order of some μs/s.

4. EVOLUTION OF THE MUONS HALF-LIFE DURATION FOLLOWING THE RECEIVED ENERGY IN THE CONTEXT OF THE EVTD² THEORY

Half-life of the muon in the laboratory when it is animated at a speed of a few m/s is of approximately 2 μs. Free muon naturally moves at speed (0,989 *c*) very close to the speed of light, in this case it can move about six hundred meters before disintegrate.

At CERN it was possible to highlight that muons half-life was almost thirty times longer if they were almost immobile. Thus they can browse about 18 km distances before their disintegration.
By relativity it can be explained that their own time is slowed allowing their half-life last approximately thirty times longer. It is current to explain this by considering their rhythm of life not changed but that their own time is extended according to relativity.
But one can think that these explanatory hypotheses are not the only ones to be able to represent these observed phenomena. Indeed, one can estimate that *these same phenomena are correlated to variable intakes of energy depending on the circumstances of their absolute speeds in the universe*.
In *the case of a quantic space-time defined and generated by EMW*, which is an electromagnetic wave of substantial energy, we understand that frequencies received by the muons from this primary wave *therefore represent relative amounts of energy received that are inversely proportional to the magnitude of the speed that animates these muons*. This is in agreement with what has been mentioned above, and which has the effect of increasing their life duration when their speeds grow to the value *c*.
Indeed, *receiving less and less energy from EMW when their speeds increase*, it follows that for muons this reduction of natural energy

input would initiate, as a corollary, ***a slowdown and decline in their decays, conversely, what will proportionately increase their half-life times***.

This way of understanding the specific phenomena of muon allows the extrapolation to radioactivity itself [13] by issuing a similar hypothesis that radioactive atoms have might also be their half-life which expand when they are animated at increasing speeds compared to their natural speed on Earth. This hypothesis could be tested fairly easily nowadays.

This type of thoughts allows to better understand the phenomena of transformations of the elements which are submitted, without having to call, imperatively, to relativity and then need to take into account the perception of an observer in another reference. Indeed, the phenomenon itself becomes dependent on the received energy levels from the EMW (in correlation with its absolute speed) and therefore it manages alone by becoming independent from another reference.

5. CONCLUSION

The theory of entities EVTD^2, fully quantic space-time and the existence of a primary light (EMW), predicts a reference of absolute speeds throughout the Universe. Absolute velocities are determinable if one can know their deviations from the reference of the Earth, for example, but also is needed to connect differences in speeds with the gaps of time given by the atomic clocks solidarity-based of the body in question. Furthermore, muons and radioactive elements disintegration can be connected to the vacuum energy inputs that become variable according to their absolute speeds referenced compared to the speed of light.

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Determinarea vitezelor absolute într-un spațiu-timp integral cuantificat prin efectul Doppler – Fizeau absolut

Întregul spațiu-timp cuantificat, structurat de o undă electromagnetică primară ce este considerată ca bază în teoria entităților volumetrice, temporale, dinamice si deformabile (EVTD^2), permite abordarea determinării vitezelor absolute. Aceasta implică un efect Doppler – Fizeau absolut □i luarea în considerarea a timpului propriu al orologiilor atomice plasate pe corpuri în mișcare.

În continuare este dezvoltată o extensie teoretică ce va depăși efectele relativității, relativ la durata de înjumătățire a muonilor □i a elementelor radioactive care depinde de aportul variabil de energie a vidului în relație invers proporțională cu vitezele lor absolute. Când corpurile se deplasează cu viteza luminii, ele nu mai primesc energie suplimentară.

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