

21 July 2009

## Considerations over the problem of the knowledge of the Universe

day/dialogue tenth

### Relativistic phenomena and time retardations .

The subject of the last dialogue interested P. very much and he had taken more notes than usual and now I was expecting an interesting series of questions .

P.: in our last conversation we spoke about transformations and from what I could understand you showed that from the original Galilean transformations to the contribution of Lorentz and of Einstein provided that the characters of the ESF were taken into account, had to be added the contribution of Doppler.

Once this was done, using the argument that from the physical point the position of the systems in the graphics could not be interchanged, you pointed that the "Lorentz's diagrams", could be functional only in absolute terms, and had to incorporate a system OS in absolute quiet (a condition encompassing the entire physical universe around O containing the observer), and the other system S' had to be the one in relative movement respect to the Observer in O.

This situation would remain even if O were in movement, but in that case the observer in O would make his readings in virtual "local absolute" conditions in which would have been difficult to assess his absolute velocity, but provided it was possible for him to establish that the absolute velocity of his system was close to zero,  $0 < v < c$  and the absolute  $v_{S'}$  reasonably high his readings would permit an acceptable approximate evaluation of the real universal conditions through the use of the graphics.

Also you said that the system S' in movement due to presence of inertial m-e  $M_{ESCE}$  (endowed of unidirectional spin, producing constant movement of S' at v speed) had to be entrapping ESF which became alloyed inside it and moving at the same speed (making of the said system S' an absolute local system, a sort of bubble inside which all the physical phenomena, described by transformations-degradations were invariable for a local observer due to the fact that the fields of m-e  $M_{ESCE}$  and ESF contained and surrounding the central  $M_{LGM}$  were moving in

synchrony with it and causing a condition of local quiet, etc...).

To all these conditions was added the comment that we shouldn't have overlooked that at the same time both system S and S' which on the Lorentz's diagrams were represented as points (therefore subsystems of the universal system OS) had to be real gravitational systems with a large physical mass  $M_{LGM}$  in the center (a star), which was intent to dissipate substantial amounts of m-e expelled as result of its own gravitational internal transformations.

Nevertheless, this meant that though we are faced by large masses (the stars) that tend to dissolve absorbed in the ESF, whilst the dissolutive phenomenon takes place, since between systems like O and S or S' we assumed no gravitational interaction, these systems do not affect each other gravitationally and the diagrams do not need alterations.

I : the diagrams of Lorentz , are representing a stimulating intuition derived directly from the results of empirical observations but their capacity to describe is limited by the fact that in them the mass is invariable (whereas in a universal situation the physical gravitational masses increase their values through gravitational absorption and transformation of the ESF into gravitational m-e  $M_{RM}$  whilst emission of light by a mass  $M_{LGM}$  means loss of huge amounts of m-e internally transformed into m-e  $M_{Heat}$  which comes out of the  $M_{LGM}$  in dissipation)

This is also another example that the mathematical formulation need continuous adaptations if we want them to describe the physical phenomena, since the diagram of Lorentz reflects only an instantaneous description of position based on data received as instant signals from a predetermined point and are not taking into account the size of the system which is in that point.

Lorentz's diagrams, (SR) with the assumption that O and S' are invariable and concentrated on geometric points, (since, as said, we overlook the gravitational acquisition and the physical loss of substance in dissipation) are, in a sense, still belonging to CM (in whose formulations the mass M is invariable and mass-energy components are unspecified) and what these diagrams can give away is a description made by an observer situated in the subsystem O regarding the behavior of the dissipation reaching it from the subsystem S', (and vice versa).

When one in the attempt to advance, expands them and explores the status of existence of these two subsystems (O and S') taking into account the notions just now mentioned (regarding the Law of equivalence and the Law of increase of the inertial mass with the increase of velocity in absolute) the ample possibilities to improve the descriptions of the physical conditions are reflected by the fact that the phenomena inside them also belong to the GR, whilst the description of the time phenomenon from one of the two subsystems to the other is relativistic since depends from the absolute amount of inertial mass which causes the temporal retardations.

In them, though, we had to be aware in regard of who is moving and how and in regard of the relativity of contents of inertial m-e  $M_{ESCE}$  and their relativity had to be considered as difference of velocities in absolute, if the temporal characters had to be meaningful.

Note: the interpretation of the Doppler Effect as integrant part of the SR is the one permitting the evaluation of velocity in absolute, or in relative absolute conditions between two subsystems, and consequently to take the DE into account results a necessity.

When it comes to GR the hypotheses made in SR remain valid but to them must be added the concept of transformation-degradation of the spin character from neutron m-e to inertial mass-energy, due to the gravity, of the central large gravitational mass  $M_{LGM}$ , to which objects immersed on the gravitational field of this central body are subjected, further, we have that in these objects presence of gravitational depression of the ESF caused by the central large mass is cause of temporal retardation of internal physical phenomena which must be added to the temporal retardation associated to velocity.

In GR there is redefinition of inertial trajectory at constant velocity, that whilst in SR was a line, in GR due to presence of gravitational static Force opposed by the centrifugal effect generated by the velocity of the object in orbit, (and therefore due to energetic constriction caused by two opposite mass Forces) is a circle .

All these are the basic concepts which, added to few more, permit to reach acceptable solutions in UDS.

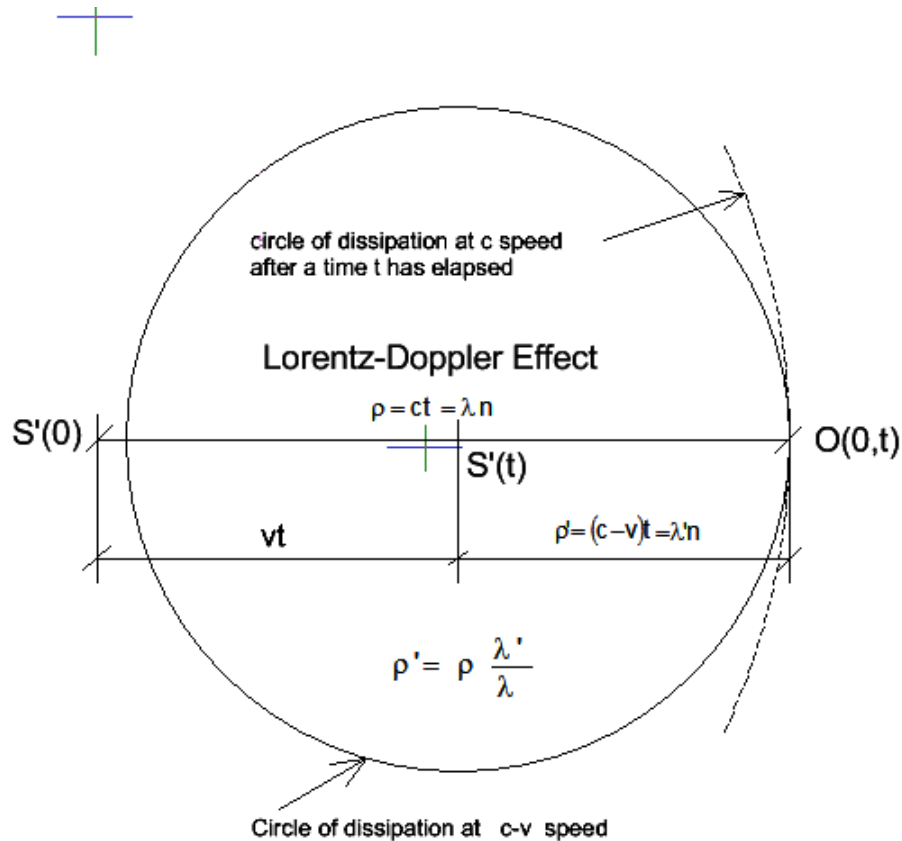


Figure 1

With Lorentz's diagram we have an intermediate example showing gradual passage from a theory SR to another (also SR, but) more advanced, that is including the GR, whilst necessity arises for solutions and explanations at deeper level of knowledge.

Note: In the original diagrams of Lorentz was not taken into account the presence of ESF with its properties as it is done now, and once that was done resulted possible to develop the more advanced and comprehensive diagram called "DELINEATIO MIRABILIS", where one must notice that the subsystems O, S and S' inside the universal system OS, still are represented as mathematical points and the possibility to advance consists of considerations regarding the fact that O, S, and S' can be solar systems more or less like ours and that the observers inside them may find themselves always in a virtual status of observation has just been mentioned.

To begin with, a satisfactory theory was necessary in order to take into account physical transformations-degradations and Lorentz's diagrams in taking into account the constancy of c and indirectly the Law of equivalence of Einstein, constituted what can be considered a defining moment.

The contribution that Einstein made to the Special Relativity (SR) theory of

Lorentz , regards the effects inside a system S' in movement, which are due to presence of inertial m-e as a substance in a status that having lost the gravitational character still retains the capacity to oppose Dominant Force developed by internal transformation-degradation or applied externally to the system S'.

This presence of inertial m-e in the system S' is endowing it of the capacity to slow down the temporal processes ruling the internal transient transformations-degradations from which generation of Dominant Force depends.

Thereafter, Einstein went on with the understanding that the effect of increased gravitation over a physical mass was also influencing the temporal phenomena (but never specified that the physical reason was due to local increase of depression of the ESF caused by the gravitational absorption and flow of the central  $M_{LGM}$ , a fact rendering his statements incomplete) and this contributed to widen the capacity of representation of the universal reality into what was called General Relativity (GR).

Note: in SR the physical masses are considered concentrated in mathematical points which in turn being gravitational systems, when expanded, can only be examined internally through a mixture of effects attributable to SR and GR.

The Doppler Effect is the key permitting a further advance provided there is physical understanding of the phenomena involved.

I presented in the previous “theme 9” the solution of the Lorentz’s diagram (SR) in the simple case in which the subsystem S' moves at v velocity towards the subsystem O in quiet, but I mentioned that the extended solution had to be found in the new diagram called “DELINEATIO MIRABILIS” (see [Ruggeri7](#)).

The above diagram in Fig 1, concentrating S' in a geometric point, reflects a return to the simplicity of an internal status of quiet inside a generic system in movement, since through the hypothesis that both inertial m-e and ESF are alloyed and move at the same speed of the whole system, we do not have objection to assume, for now, that the generic gravitational system fills a space having an Euclidean connotation.

In conclusion the physical conditions cannot be represented through a mathematical reciprocity since if we swap the system O in which the observer makes his measurements with the system S', the physical conditions, though described with the same (identical) mathematical formulation, are real in the first case (whereas O is considered in absolute quiet) and virtual in the second.

If we consider the solar system, an observer in the Sun (considered as a system in absolute quiet concentrated on a point, see [Appendix fig 2](#)) could see in real terms against a celestial background, the Earth orbiting it, whilst an observer on Earth through an association of diurnal rotation and orbital movement sees in virtual terms the Sun coming back over his head.

Truth is that the Earth which is the object in movement along its orbit (and has diurnal rotation) is defined by presence of substance as m-e  $\Delta M_{ESCE}$  (is in movement at orbital constant  $v_0$  and rotates around its axis) whilst inside it the local observer virtually perceives to be in conditions of immobility.

P: then in your explanation what is the manner in which we can obtain reciprocity, I mean, invert the position of the observer, making the readings from a system to the other, and at the same time describe the relativity of the movement?

I: we have a way that helps to explain but when we do this exercise we have to point out what happens in physical terms to the system where the observer resides and how its readings must be interpreted.

Let us consider a spaceship (a system S') moving towards our solar system, represented by O assumed in absolute quiet, the m-e  $\Delta M_{ESCE}$  is present in the spaceship and not in O where we are.

From Earth which is part of the system SO, assumed to be universal, and represented by the point O, the observer sees the spaceship coming closer.

What we on Earth need to know now is the distance  $\rho$  between us and the spaceship when the signal was emitted (and assuming that we get it using the parallax effect), from  $\rho = c t$  we obtain t "temporal distance", then through the measure  $\lambda'$  of a light signal (of emission of a predetermined element, coming from the spaceship, see dialogue 9) since we know  $\lambda$  we can get the velocity of approach  $v = c(1 - \lambda'/\lambda)$ , therefore, now that we know v and t, we deduct the distance of simultaneity

$$\rho' = (c - v) t = \rho \lambda'/\lambda = c (\lambda'/\lambda) t = \lambda' \mu t = ct_s.$$

The above is the closest value we can get of the distance  $\rho'$  from the Lorentz's diagram used in the mentioned conditions.

We now can say that the distance  $\rho$ , where the signal (dissipation) originated, when considering S', was run at a composite speed  $c = v + (c-v)$ , (inside an Euclidean universe SO in absolute condition of quiet) since the signal (dissipation) coming out at  $c-v$  from the spaceship moving at v speed, results compounded with the velocity v of approach of the spaceship and moving at the maximum speed c.

The observer in the spaceship, instead, receives from O a signal at constant  $c = \lambda\mu$  speed whilst he is moving against it at v speed and since inside the spaceship the speed of light cannot exceed c and we presume that due to impact  $\lambda$  has become  $\lambda'$  the reading inside the spaceship is going to be  $c = \lambda' \mu'_{Ship}$ , whereas he obtains a virtual product  $\lambda' \mu = c-v$  ( $\mu$  obtained in local absolute conditions of quiet in the lab of the spaceship see dialogue 9).

We know that the speed of approach of the spaceship is  $v = c(1 - \lambda'/\lambda)$ , but the spaceship receives the signal from O at c speed and the impact of the two signals happens at  $c+v$  therefore his measurement of  $c-v$  is virtual and **only reflects what is left of the signal after the impact has changed the value  $\lambda$  of the wavelength into  $\lambda'$** , after consideration the observer in the spaceship is forced to admit that being him in movement he impacts with velocity v the signal coming at c speed from O in quiet and the following expression can be extracted from the data available by him in virtual conditions:

$$\lambda' \cdot x \cdot \mu = c + v$$

his  $\lambda' \mu = c - v$  is a virtual reading which needs a factor  $x$  of correction in order to give the real solution of impact in the Euclidean space:

$$x = \frac{c + v}{c - v} = \Phi^{-2} > 1$$

Note: in this case the signal  $\lambda$  coming from Earth at  $\mu$  frequency  $c = \lambda\mu$  is compressed by the spaceship into  $\lambda'$  wavelength and enters the spaceship at frequency  $\mu_{\text{Ship}} > \mu$  the observer in  $S'$  must correct himself saying that the signal is impacting at the compounded speed  $c + v$  but only locally at the boundary of the system  $S'$  since it arrives there at the speed  $c = \lambda\mu$ :

$$c + v = \lambda' \mu x = \lambda' \mu \Phi^{-2}$$

but as it enters the system of the observer the impact of the signal is reduced down to the value  $c = \lambda' \mu_{\text{Ship}}$  for the internal observer, since it cannot have a speed higher than  $c$ .

Note: the above relation in this case (an identity) brings into use the term  $\Phi$  "SUMMA RELATIO" (see [Ruggeri7](#)).

Note: this application of SR requires the system  $O$  (the Earth in this case) in a status of absolute quiet and since this is an approximation all the readings will be approximated, because the Earth is not in quiet since is rotating around its axis and moving at  $v_0$  orbital velocity inside the solar system which is not in absolute quiet as well.

Given the introductory nature of these dialogues I feel to mention the topic and just show that the error introduced (in the SR) when considering the Earth very close to immobility for small values of  $v$  relative between the two systems is very high, but has a tendency to reduce with the increase of  $v$ .

The universal constants  $k$  and  $c$  are both related to universal phenomena, the one of absorption of the ESF by the gravitational  $m-e$  and the one of absorption by the ESF of the  $M_{\text{Heat}}$  belonging to a physical mass, which once inside the ESF becomes dissipation, and these absorptions must be also considered as two independent but equivalent manners permitting the definition of the time phenomenon, both associated to uniform transformation-degradation.

I have mentioned that the effect of presence of inertial  $m-e$  (non gravitational) inside a system, is not felt by an observer measuring transformations degradations generating Dominant Force from inside its own system, and this condition of the local observer defines his presence in local absolute terms, whereas an observer external to the system makes readings which take into account that there is relative presence of the inertial  $m-e$  between his system and the external system observed (and therefore a relative  $v$  which must be elaborated in absolute terms in SR or in local absolute terms in GR).

Note:  $v$  relative velocity between two systems in movement cannot be used to determine the time retardation or advance  $\Delta t = t_{S'} - t_O$  at the clock of one system in respect to the clock of the other since the mechanics of time reference require that two identical clocks be, at first, set by the observer to measure Newton's time, (absolute in SR and local in GR) inside a system and then the clock to be compared be inserted in the system observed (this comparison is nevertheless, a feature calculable but not easily practicable through direct observation).

Whereas initially both clocks are measuring Newton's time in O (in the SR example) and in Earth (in the GR example) and then one clock transferred in S' (in the SR example) and in Mercury (in the GR example) the [general formulations](#) in SR and in GR are:

$$\begin{aligned} \text{in SR} \quad \frac{t_{S'} - t_O}{\text{sec}} &= - \left( \frac{V_{S'}^2 - V_O^2}{2c^2} \right) \frac{\text{sec}}{\text{sec}} \quad \text{and} \\ \text{in GR} \quad \frac{t_M - t_E}{\text{sec}} &= - \left( \frac{V_{OM}^2 - V_{OE}^2}{2c^2} \right) \frac{\text{sec}}{\text{sec}} \end{aligned}$$

In SR the above formulations are general and do reflect the case of the Lorentz's diagrams only when the system O is in a status of absolute quiet, ( $v_O=0$ ), wherefrom a clock is moved in S'.

In GR we still have a general formulation and the particular case that would consider the observer at the center of the Sun where  $v_{OSUN}$  (instead of Earth) results impractical. ([see appendix fig 2](#)).

Note: the GR case includes a similar formulation of retardation of time phenomena caused by gravity, whereas the  $v(r)_0^2/c^2$  (is the value of depression of the ESF in function of  $r$  to which further time retardation is associated) :

$$\frac{t_M - t_E}{\text{sec}} = - \left( \frac{V_{OM}^2 - V_{OE}^2}{c^2} \right) \frac{\text{sec}}{\text{sec}}$$

The above formulation is peculiar to GR and is to be added to the retardation caused by percentage increase of the inertial mass and for it is valid the same observations made in the case of the inertial time retardations.

Inside a system in movement, as it can be a spaceship moving in absence of gravity this dependence from absolute presence of inertial m-e cannot be easily put into evidence, (the spaceship moves but we do not know exactly at what absolute speed), but inside a gravitational system, (local presence of inertial mass-energy depends from the orbital movement which is referred to a local absolute  $v=0$  at the center of the system and the same argument is valid for the gravitational depression  $v(r)_0^2/c^2$  which is zero at the center of the system.

In conclusion, when from an object in orbital movement  $v_0$  we manage to make a local absolute measure of time (Newton's time) the clock is making a virtual measurement since is permeated by the inertial m-e of the object to which it

belongs moving at  $v_0$ , and subjected to the gravitational depression at that radial distance from the center (and only the physically inaccessible center of the system is the local absolute point of reference where an hypothetical clock has no content of local inertial m-e and where the gravitational depression is zero.

(See [Appendix](#) fig 2).

Note: in the GR description of relativistic effects the centrifugal Force in a circular orbit is a mass Force equivalent and perfectly opposite to gravity and cannot exist unless there is an orbital velocity  $v(r)_0$ , whereas when a centrifugal Force generated by rotations around an axis like in the case of Earth is smaller than the gravitational static Force at its surface, it only relieves partially the contact Force opposing the Static Force, and since it is a mass Force is reducing the effect of the gravity.

We can see then that formulations related to temporal effects completely ignore that on Earth gravity is mainly opposed by contact Force whereas in a circular orbit is totally opposed by a centrifugal mass Force.

The clocks used can be immune to this change of physical conditions but our bodies are going to suffer a dramatic change of status of existence to which will be difficult for them to adjust.

Inertial m-e not only can be absent in absolute but, being substance which does not takes part to the development of transformations-degradations of gravitational nature which originate the Dominant Forces, when present will act as a retardant of the time phenomena, and what is more, it has the capacity to constitute (alloyed with the ESF) a field surrounding the system reacting with the surrounding ESF in such a way that the object mass acquires movement.

Note: an hypothetic gravitational system similar to our solar system, in mathematical terms influences through absorption and dissipation, the surrounding space (considered Euclidean) from the center of the  $M_{LGM}$  to infinity, but in physical terms the effect of the gravitational field which it generates must be considered finite and this paradox is proved from the observation that the m-e alloy  $\Delta M_{ESCE}$ -ESF must have a boundary beyond which the capture and entrainment in orbit of a physical gravitational mass is not possible, we are therefore making the hypothesis that a gravitational system is not extending to infinity but is enclosing a relatively small (limited) Euclidean universe of a finite radius size, small when compared to the interstellar distances between gravitational systems, existing inside an all encompassing universe where we made the hypothesis that there is no gravitational interference between them, (see dialogue 9).

The diagram DELINEATIO MIRABILIS (DM), represents a satisfactory beginning that permits the calculations of relativistic phenomena between gravitational systems separated in such a way that we can exclude gravitational interaction between them, what is wanted with its use is to achieve a convincing and acceptable description of the universal reality in conditions of simultaneity.

With the DM, an hypothetic system (that can also be a spaceship or smaller entities made of physical gravitational mass), can be placed in a single point of the infinite Euclidean space and its velocity can be directed in all possible directions in respect of an observer in the system O, which can be in absolute (or near absolute) conditions of quiet and in this manner the observer will observe in real or near real natural conditions, whereas if the system O (where the observer is) is endowed of movement, the observer will be making virtual measurements necessitating interpretation and correction.

Apart from profiling the problem, little advance I made here above in inverting the place of the observer, (putting him inside the spaceships in motion), since a comprehensive treatment of this topic still exceeds the intents of this introductive presentation.

The original diagram of Galileo having the purpose to represent the physical reality, underwent radical changes, due to the necessity (as above mentioned) to accommodate the speed of the light, the Law of equivalence and the DE, but essentially after becoming "Lorentz's diagram" and successively "DELINEATIO MIRABILIS", has remained simple.

P : then in the spaceship moving at absolute universal velocity higher than the comparative conditions on Earth, the time runs slower respect to the Observer on Earth due to slow down of the phenomena of transformation-degradation belonging to the open cycle of degradation of the m-e inside the spaceship but runs normally for a traveler inside it, but above when you mentioned that on Earth we are subjected to presence of inertial m-e to which we are inured since it was with us from the very beginning, since the spaceship, is endowed of an higher content of inertial m-e subjecting his physical mass to a substantial increase of the ratio  $(M_0 + \Delta M_{ESCE}) / M_0$ , and given the presumed small size of the spaceship, will be difficult for a traveler to reinstate a system of Forces comparable to the gravity on Earth.

How all this will affects his metabolism?

Could the traveler find himself in an inescapable situation of time retardation where the phenomenon portends increase of inertial mass contents affecting its metabolic processes on increasing fashion with the increase of velocity of the spaceship, and lack of gravity, where the phenomenon portends lack of the depression and flow of ESF causing the gravitational Force and associated phenomena and where both of these phenomena would and in final analysis affect the functioning of his brain and its state of mind?

I: equating our Earth to a spaceship we must realize that we on Earth are subjected at least, to three noteworthy inertial fields (of movement), the diurnal rotation around the axis, the orbit around the Sun and the orbit of the solar system around the center of our Galaxy, to which conditions we and all the forms of life are reasonably adapted since life began on our planet.

The physical mass of our bodies contains all these directional inertial m-es which once traveling in space will gradually be subjected to major changes whilst

our bodies acquire the directional value of velocity of cruise in space (amounting to values of inertial  $m-e_s$  usually much higher than all the values once possessed when we the solar system was left behind, the question is “how much intake of inertial  $m-e$  will our bodies be able to stand and for what periods of time?”

Assuming that space trips are a real possibility, in future we may be forced to assess the effects of these changes on our metabolism before planning space missions and I think that these changes affecting the contents of inertial  $m-e$  of our bodies are going to be so dramatic that the space travels will have to be limited to short periods of permanence in more or less eccentric orbital paths inside our solar system.

We must take into consideration that once abandoned the gravitational field of our solar system, when it will be at a distance from which we can consider its presence concentrated on a point, the formulations giving us temporal discrepancies will be based on a first approximation of a temporal function  $dt/t = dc/c$  whose convergence to a satisfactory value of existence as physical mass object is for  $v \rightarrow 0$  whereas with the increase of  $v$  (for  $v \rightarrow c$ ) any object made of physical mass gradually changes its identity to become an object concentrating high values of inertial  $m-e$ .

This forces us to assess that we on Earth in our present status of existence are moving in absolute fashion inside the physical reality, at an absolute velocity of the order of maybe 200÷300 hundreds km/sec, which is a speed range whereas the contents of inertial mass are not excessively detracting from the fact that our physical mass is reasonably close to its platonic model at absolute  $v=0$ , but with the increase of  $v$  any object including the spaceship into question and any presence in it of human cargo, with the increase of relative velocity respect to the solar system, will be subjected to physical changes of its status of existence gradually tending to become a limit status of existence concentrating inertial  $m-e$ .

It is then justified that a large part of this UDS theory regards values  $v$ , not possible to state now but surely not over 2000÷3000 km/sec, as upper limit of the speeds that our crafts and our bodies can take for very limited periods of local time or indeed of absolute universal time.

Now the question is: "assuming that  $S'$  is our spaceship, beside the phenomenon of retardation, what happens to a clock in it?", the material of which is made will it behave like the identical clock in  $O$  and from the behavior of the clock will we be able to describe the temporal behavior of all the physical phenomena including those affecting our bodies? (which as said will be working in physical conditions different from those on Earth).

Part of the answer to the above question is definitely no and this is demonstrated by the fact that in space flight conditions we already have a limited choice of clocks as time measuring devices based on the restriction that the clocks presently used for these purposes had to be developed.

They are the “cesium clocks” since we have proof that when they are moved in space (SR) or in other planets or in orbital movement (GR), they follow reasonably well the relativistic criteria based on formulations as presented above.

Note: in the other hand, our bodies are definitely dependent not only from gravity

but from quantum mechanic effects difficult to foresee in these changing environments.

Inside a spaceship, there will never be complete restoration of the conditions on Earth and existence will be precarious ....

In the other hand is most obvious that if we remove ourselves with our clock over the surface of the Sun our bodies will be instantly cremated and our ashes flattened and the clock which we carry with us, of whatever material is made will not meet a better end, notwithstanding so we can at safe distance still calculate what could possibly be an hypothetical retardation caused by the gravity of the Sun over an hypothetical indestructible clock, identical to ours, transferred there (and achieve through mathematical means...) a fact that should by itself demonstrate that physic phenomena are real and destructive, whilst mathematics being in a platonic reality of ideas can at times defy the fiery, flattening and dismembering realities of the natural world.

Note: the dynamic equilibrium in the perfectly circular orbital path to which I referred above is equating static mass Force to the opposing centrifugal (also mass Force) over an ideal orbital path but this conclusion belongs to the CM and is not entirely correct, and when with the theory of the UDS we equate the gravitational transformation-degradation generating the Dominant Force to the opposing inertial mass Force, we only come up with an approximated expression.

When we subject the two unequal terms to further investigation we have that the reason why the equal sign cannot stand is due to the necessary distinction that there is in UDS between the m-e value  $M_0 = M_{RM} + \Delta M_{ESCM}$  appearing in the gravitational expression giving the Static Force and the value  $M = M_0 + \Delta M_{ESCE}$  of the physical mass including the inertial component which appears in the opposing Force:

$$M \frac{v_0^2}{r} = (M_0 + \Delta M_{ESCE}) \frac{v_0^2}{r} \cong M_0 \frac{kM_{0LGM}}{4\pi r^2} = M_0 \frac{GM_{0LGM}}{r^2} = M_0 a(r)$$

In these circumstances the above expression is valid only in first approximation if the value of  $\Delta M_{ESCE}$  is small enough that can be overlooked.

The above relations obviously are using a constant value of  $r$  and show the value of the static Force opposed by the centrifugal one, but as pointed now the equal sign is not respected and the term (extra Force) permitting the establishment of the equal sign justifies the presence of the perturbation to which is associated the orbital precession (rendering calculable the nature of the perturbation and the value of precession), and this is not all since wisely using the formula of perturbation, once we extend it to the whole mass  $M_{LGM}$  we get the output of dissipation coming out of it (see [Ruggeri8](#))

What is more is that the possibility to assume an orbital velocity  $v_0 = \text{const}$  over a nearly circular orbit, permits the manufacture of a Newtonian clock based

on the definition of a velocity  $v_0$  binding to Newton's ULG, the physical value of a transformation inside a device called clock (loaded of the inertial m-e of that particular orbit and existing in that particular status of gravitational depression of the ESF).

In this context the building of an old fashioned clock was a handy model of reference to a circular orbital movement (a feature which has been abandoned in modern time measuring devices).

P.: It seems to me that the contribution of the DE to the extant theory, as suggested by you, together with the assumption that space filled with substance is Euclidean, streamlines everything and what was so hard to understand up to now eventually will become matter of fact; and possibly will be source of new advancements.

Then, once deepened the understanding of this theory of relativity, what is its practical utility, if any, since many affirm that many practical advantages will follow through a good satisfactory theory?

I : presently, as a matter of fact the relativistic phenomena are disregarded in most cases and calculations are still made in base of Classic Mechanics, using Galileo's model.

This results true in all the fields and especially in engineering and in many problems of physics of astronomy, and presently applications based or claiming to be based on the extant theory of relativity are few but rewarding, as for example the GPS, and the very useful applications of ring interferometers based on the Sagnac effect.

As it usually happens, instruments are used for their usefulness but there is little interest to know how they work, only few dedicated scientists push forward at the edge of the technologic knowledge in search of results which are intended to improve life on Earth.

The basic phenomena from which the relativity sprung, up to now, are really few, since after Roemer Christensen (almost contemporary of Newton), realized that the light had a speed, which is one of the basic concepts ruling relativity, there had to be the observation of the phenomenon called precession and the observation that a beam of light was bending its path under the influence of a strong gravitational field, whilst phenomena of weird character were observed during the study of electrostatics, electrodynamics, electromagnetism, light emission from quantum particles losing speed in the process etc..

All this produced a consciousness, in many scientists that the atomic masses were not invariable, especially when it was observed the equivalence between two total Forces (Heat and Work).

Pr. A.E. tried to summarize the situation, and found the fundamental Law of equivalence of the m-e to the expression used by the scientists for the value of energy (total Force), for which the Law of increase of the inertial mass with the increase of speed is a corollary.

He managed to generate great interest, since his work was fundamental to a newborn science called Quantum Mechanics, (QM), studying the phenomena

related to the clusters of basic particles of which the atom is made and which can in some circumstances come out of it at speeds putting them out of range of most of the phenomena treated on the UDS (which is a Science investigating phenomena occurring at low velocities of the physical masses,  $c \gg v \rightarrow 0$ ), but when he denied the existence of the Ether/ESF, he missed the point, although he arrived to formulations extremely close to the true solutions (the ones obtained taking into consideration the presence of Ether/ESF) his conclusions have an empiric hallmark, so that without the assistance of a solid basic theory tying up physical phenomena through transformations-degradations following each other as effects generated by a cause, his suggested connections between mathematics and physics, almost dried up the efforts that the next generation made in order to proceed and advance and many urgent questions are unanswered at present.

I can say as a matter of fact, that maintaining the relations between phenomena of physical nature, we can manage to explain, in terms of relativity and through connections based on cause and effect, not only phenomena related to the gravitation that are directly measurable, but can carry on to explain in terms of the basic absorption of ESF by the gravitational m-e contained inside the physical mass, the development of phenomena internal to a physical gravitational mass, whose final effect is dissipation, and these gravitational phenomena can be calculated with the help of the formulations of the UDS, (see [Ruggeri14](#) pg 3) and we can also justify the precession (both geometric and temporal), and time retardations in terms of presence of gravitational depression in the Ether/ESF and in presence of inertial m-e, in the physical gravitational mass in orbit, and these explanations are of enormous interest in the effort to define phenomena belonging to the universal reality.

All this was obtained adding to the physic discipline remarkable conclusions of universal value for which simple formulations were required.

The theory I developed, postulated the existence of interactions between the ESF and the gravitational m-e contained inside the physical mass which cause the emergency of the gravitational field and all the phenomena associated to it, including the emergency of dissipation of m-e from a, large enough, physical gravitational mass.

I confronted satisfactorily the Global Positioning System (GPS) which is an application of practical utility which needs to take into account a combination of precession and temporal phenomena, but presently is just an empirical application widely used in practice but little understood in theory. (see [Ruggeri19](#) for now, and more is to come....)

The solution of the precession, up to where I managed to reach, represents a good step forward but I am sure that the complexity of the phenomenon will maintain busy many other researchers for long time in the future.

With the precession as a matter of fact we are faced by two temporal phenomena, in a sense two different types of time measurement are coexisting at the same time, one measurement requires two real identical clocks (in the case of the GPS based on the transitions of the cesium), and the other measurement of time is astronomical, and can be figured in modeling the orbital

path with the circular movement similar to that of an arrow of a clock of old (one of those clocks inserted in the bell towers of many Municipalities around the World), permanently out of phase and in need of reset at successive returns, I mean that if we figure to observe from the center of the imaginary dial of a clock that carries a mass at the tip of an arrow (see [Appendix fig 2](#)) sweeping the orbital path at constant speed, and assume that such a mass is containing another clock affected by retardations due to the value of the orbital velocity and to the retardant effect that the gravity imposes on it, whilst comparing the readings to the local universal clock in our possession, we are faced by two different phenomena,

1) the geometric one, since at return of collimation we would need to manually reset to  $t=0$  in the dial, through a geometric movement, because in what we called the astronomical clock, the tip of the needle is resulting in precession in respect of our local universal clock and

2) once done the operation in 1, inside the said tip, (representing the physical mass in orbit) the internal clock dials also would need to be reset to zero respect to our universal clock.

Note: the explanation has been oversimplified since we cannot observe the phenomenon from the center of the system (the center being usually occupied by the mass of a fiery star) and we instead observe it whilst in orbit on Earth and since we are subjected to similar phenomena of precession and retardations we need to extricate from them before coming out with a sensible solution, (this we obtain, whilst we are in relative physical conditions of movement with the other clock, relating our readings with the physical inertial and gravitational conditions existing at the center of the system and wait until our position in orbit and the position of the satellite observed are expected to return into collimation (a fact that does not happens perfectly, since at that point we observe precession).

In conclusion, I tried to sort out a large number of arguments (some very evident) sustaining my theory based on the existence of the Ether/ESF, and I am confident about the results obtained, since through many consequences of intuitive nature I managed to solve problems that up to now had no solution (this includes the presentation of the cycle of degradation of the mass-energy).

P.: A theory like this will never be complete, but I can see from now that this is a real start, a step beyond the extant theories of relativity, though just a step....

This tenth dialogue had been short but the conclusions reached produced a great amount of surprise in P, enough to make him silent, being him a rational conservative type of person, at this main point he had realized that he was confronted by a theory presenting a complete logical sequence of explanations of phenomena tied up through cause and effect (following the views of Descartes).

He was not alone in trying to solve problems in the field of knowledge and we can say that he had spent a lifetime, trying to decipher the illusions produced by the present theories, now he had the consciousness to be faced by something promising, but its ego was refusing to come to terms with the new reality.

Whilst this status of things was drawing on, seeing him so immersed in deep

thoughts I remained silent.

Looking at him I could not avoid becoming deeply aware that he was trying to hide his emotions.

This then had been the end of the tenth dialogue.

Appendix

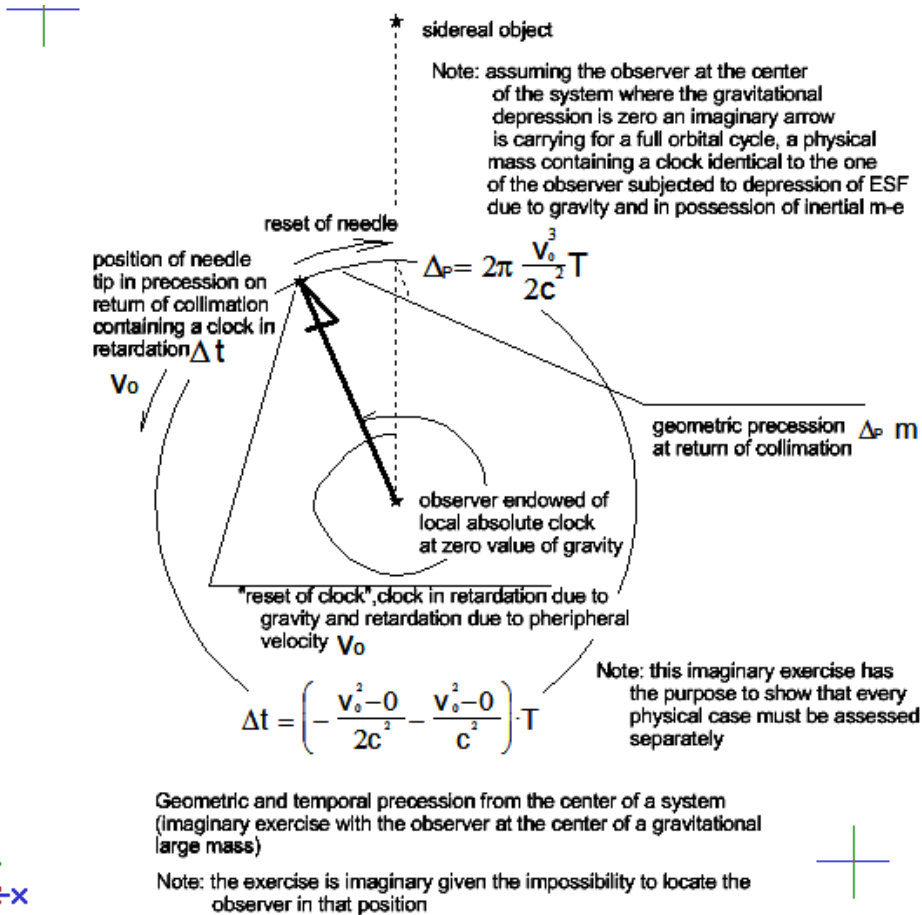


Figure 2 precession observed from the center of a gravitational system

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