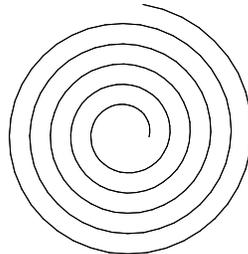Antonio Ruggeri Dr. Ing.
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EX SPIRA AQUA MUNDA

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Abstract: 1) The true characters of Space occupied by the Ether/ESF and other seminal concepts. 2) Considerations regarding a mass in movement inside the space occupied by the field of Ether/ESF and the physical changes that such a mass is inducing in the Ether/ESF substratum. 3) Backward transmission in the field of Ether/ESF of the gravitational effect of absorption. 4) Polarization effect acting over a fluid mass in movement, justified through application of the law of conservation to a flow of mass from a horizontal orifice. 5) Comments

The true characters of Space occupied by the Ether/ESF and other seminal concepts

Considerations regarding a mass in movement inside the space occupied by the field of Ether/ESF

I refer now to the previous paper (ruggeri47, "Atoms, spin, relativity, friction", it offers an elucidation about the nature of movement, since in it, to the simple explanation that justifies

in terms of conservation of energy, the partial transformation-degradation of neutron mass-energy into kinetic energy:

$$1) \qquad M{\cdot}c^2 = \frac{1}{2}M{\cdot}v^2 + M'c^2$$

is opposed the notion that $M'c^2$ has no reason to exist as a system , since presence of velocity v requires it to be a relativistic entity inside which the velocity of light is $c' = \sqrt{c^2 - v^2}$, and therefore the 1) above (in which the physical matter components are expressed in energy equivalent terms) must be interpreted as :

$$1a) \qquad M{\cdot}c^2 = \frac{1}{2}M{\cdot}v^2 + M'\left(c^2 - v^2\right) + M'\,v^2$$

Where the system under observation is $M'(c^2\text{-}v^2)$ or $M'c'^2$, we then are forced to suggest that in the unit of time which takes to the mass M' in movement to occupy the volume V'=vV, the energy balance $M'v^2 = p'V'$ in the 1a) above is contained in the volume V'=vV inside which the specific pressure is p'= ρv , we then have:

$$M'v^2 = p'V' = \rho v \cdot vV \qquad (\rho V \approx M')$$

We must conclude that the object mass M in conditions of quiet, when in movement at v velocity inside the Ether/ESF is split in three parts as in 1a) :

1) kinetic energy $\frac{1}{2}Mv^2$

2) a "relativistic" system $M'\left(c^2 - v^2\right) = M'\,c'^2$

3) a field of pure energy $M'v^2$ belonging to the system $M'\left(c^2 - v^2\right)$ surrounding it (see graphic below) and occupying the volume V'=vV at specific pressure p'=ρv distributed inside the said volume V'=vV

Note: the kinetic energy $\frac{1}{2}Mv^2$ is belonging to M' {which is made up of both the physical entities in 2) (a relativistic system) and in 3) a field of pure energy of volume V'=vV, distributed over the underlying Ether/ESF occupied by substance at a specific density p'=ρ∗v [ruggeri47- case a) gravitational]}.
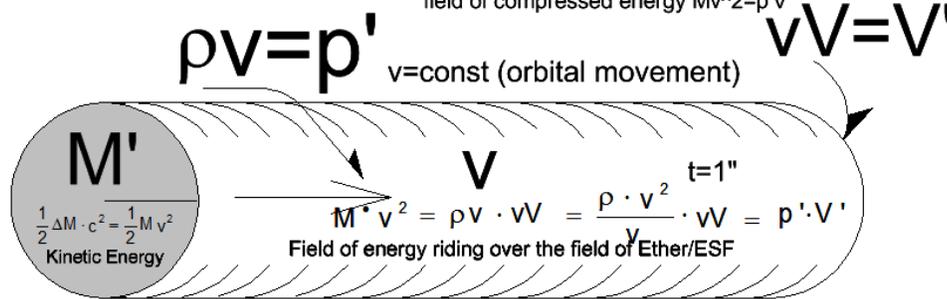The same arguments above apply to ruggeri47 case b) physical.
Note: at any time is to be considered that in the formulations is v<<c.

Let us refer now to the case a) in which the object in movement has acquired constant velocity through internal gravitational transformation-degradation: (and now moves in orbit at v=const).

Concepts regarding the physical changes to which is subjected the Space (as physical entity) hosting mass in movement

No friction during movement of M' at v speed inside the surrounding Ether/ESF

Directional movement of the relativistic system M' through absorption by the Ether/ESF of the kinetic energy belonging to it, is due to presence of its external transient field of compressed energy Mv^2=p'V'

$$\rho v = p'$$

v=const (orbital movement)

$$vV = V'$$

$$M'\,v^2 = \rho v \cdot vV = \frac{\rho \cdot v^2}{v} \cdot vV = p' \cdot V'$$

Field of energy riding over the field of Ether/ESF

M'

$$\frac{1}{2}\Delta M \cdot c^2 = \frac{1}{2} M v^2$$

Kinetic Energy

V

t=1"

The directional absorption by the Ether/ESF of the Kinetic Energy belonging to M' is made possible by presence of compression M'v^2 over the underlying field of Ether/ESF

$$M\,c^2 - M' \cdot c'^{\,2} = \frac{1}{2} M \cdot v^2 + M'\,v^2$$

Note: that the mass M' , in orbit, can be large enough to have its own gravitational field which is defined by an Hill sphere moving with it M' is in orbit inside a gravitational field of depression of the Ether/ESF defined by the boundaries of the Hill Sphere of the central gravitational mass which (also moving on its own)

Fig 1

The directional absorption by the Ether/ESF of the Kinetic Energy ($KE=\frac{1}{2} Mv^2$) belonging to the relativistic system M' means movement of M' since the KE is solidly attached to it, and the presence of a field of compression surrounding M' explains the existence of a directional value v of Spin attributed to the Kinetic Energy.

This scenario changes in the extreme case (when by way of transformation-degradation the KE separates from the mass M and becomes Heat) since Heat, in the status of mass-energy, coming out of the mass M under pressure once in contact with the Ether/ESF is acquiring depression c and velocity of dissipation c in a manner similar to what shown in the above diagram where in the energy field surrounding the mass M' to volume V'=vV run in the unit of time would correspond a value of compression p'=ρv depressed v times when compared to the compression p=ρv² of the field M'v² ~ ρv² · V'/v.

Inside the system $M'c'^2$ in movement the speed of light is c' in respect of an external observer, in the status of quiet belonging to M, but maintains the value c in respect of an observer internal to M' (and this is the character distinguishing M' as a relativistic system).

In the meantime, as shown in the above graphic, $M'c'^2$ whose Kinetic Energy is absorbed by the Ether/ESF and moves it at v speed is internally situated in a bubble (system M'v²) constituting a field of energy which moves frictionless inside the Ether/ESF.

Backward transmission in the field of Ether/ESF of the gravitational effect of absorption

Now a question arises, since we have adopted the physical concept that the gravitational phenomenon is the result of presence around a gravitational M_{LGM} of a field of depression in

the Ether/ESF, generated by absorption (<u>absorption is a temporal phenomenon</u>) by the neutron mass contained in the physical mass M_{LGM} at the centre of the gravitational system, this absorption of substance extremely compressed requires that the field of depression (as a field made up of extremely compressed substance) surrounding large masses, solar systems, and galaxies adapts with extreme rapidity to the high values of velocity of the same(large masses, solar systems, and galaxies).

   This can happen only if the backward propagation of the gravitational effect consisting of absorption of the Ether/ESF by the central gravitational large masses, solar systems, and galaxies, is <u>higher than the speed of light</u>, indeed for this phenomenon I suggested a value c^2 for the speed of backward propagation of the gravitational effect.

   The flow per unit of area across a sphere of radius r external to the gravitational mass M_{LGM} <u>assuming that the Ether/ESF has density $\rho = 1kJ/m^3$</u> (expressed in units of energy kJ/m^3) (see "The Nature of the Forces" download 4188) results to be :

$$\varepsilon = \frac{G \cdot M_{LGM}}{r^2} = \frac{k \ M_{LGM}}{4\pi r^2} \left[\frac{kJ}{m^3} \frac{m}{sec} \right]$$

   In actual fact for the sun it would be:

$$\varepsilon = 275.5 \quad \left[\frac{kJ}{m^3} \frac{m}{sec} \right]$$

   This result (presenting the cause of gravity as a flow of substance in kJ) would be nonsense since the Ether/ESF is a substance in a status similar to neutrons which as suggested has density $\rho = 1[ton/m^3]$ and in that case it would be very finely diffused in the Euclidean space resulting almost impossible to detect it (as is the case indeed).

   From the gravitational formula of Newton results that if we accept this last hypothesis, the velocity of absorption of the Ether/ESF at the surface of the Sun will be :

$$\varepsilon_{me} = \frac{275.5}{c^2} = 3.06e-15 \left[\frac{ton}{m^3} \frac{m}{sec} \right]$$

   To this value of velocity of absorption, we suggested above that, is associated a backward transmission of effect at c^2 speed.

   Since the Hill Sphere of the Sun has been valued to have a radius of <u>r~1yearlight</u> we have that the backward transmission at velocity c^2 of the gravitational absorption would take a time $t = r/c^2 = (3e8*365*86400)/c^2 \sim 0.10512$ sec before the effect of gravity of the Sun over the field of depression of the Ether/ESF reaches back to the extreme periphery of its Hill Sphere.

   This is an acceptable value and more so if we apply the same treatment to the centre of our Galaxy, the Via Lactea distant from our solar system r~1e5yearlight, in this case if we still assume c^2 as velocity of backward transmission of the gravitational effect, the time necessary, for the gravitational effect caused by the very large mass on its centre, to reach the solar system, will be:

$$t = 1e5*0.10512 \sim 10512 \text{ sec} \sim 3hrs$$

   I cannot prove this hypothesis but I have a clue that the retardation of effects due to backward transmission of the gravitational effect on the whole system is shaping the positions of the various systems belonging to it into two logarithmic spirals coming out the centre of our Galaxy.

   Note: the density of the Ether/ESF in terms of mass-energy equivalence has been compared to the density inside a volume occupied by a mass made of atomic entities, in

reality substance present in the Euclidean space in that status is intangible (Ethereal) and to us gives the impression that the space occupied by the said substance is empty, my assumption therefore not only is based on this observation but also on other conclusions regarding the fact that the Ether/ESF is directly absorbed by the gravitational mass as substance in the highly compressed status of existence similar to neutron mass-energy.

The status of Ether/ESF, at present, can only be theorized since we do not have instruments capable to make measurements of its characters but we must notice that according to current perceptions it results that the interiors of the atomic mass, in general, if we except that the atomic nuclei are made of highly compressed substance,(neutron mass) is occupied by substance at extremely low density.

Polarization effect

The example below represents an attempt to use the relativity theory in order to explain phenomena observed in events which are part of the engineering experience and practice.

I am confident that once these budding concepts are accepted they will cause a revolution in the manner the theoretical subjects are presented as I managed to apply them to old problems that up to date had been unsatisfactorily justified.

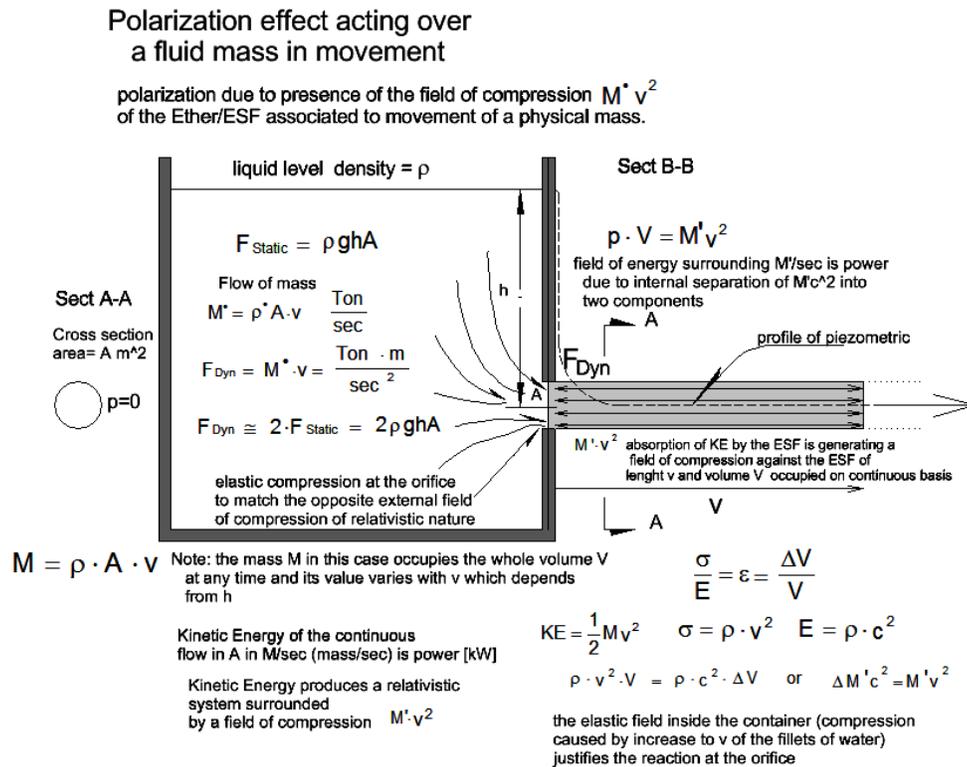Note: what treated above "must be read" together with this presentation.

Fig 2

The light grey area represents the zone of transient passage of mass $M^\bullet$ [Ton/sec], applying to the mass $M^\bullet$ flowing from the orifice A during the time of 1 sec the equation of conservation (Ruggeri47) we have the following transformation-degradation in A :

$$M\ c^2 = \frac{1}{2}M\cdot v^2 + M^\bullet\left(c^2 - v^2\right) + M^\bullet \cdot v^2 \quad \left[\frac{kJ}{sec}\right]$$

   The above equation of conservation tells us that if we consider the equivalence mass-energy, we are dealing with fields of energy impacting over a substratum made up of Ether/ESF.
   Since the Ether/ESF is also a field of energy on a singular status of existence, the manner in which these fields are present, and react with the Ether/ESF substratum, determines the movement, of the reduced mass $M^\bullet$ (Kinetic Energy belonging to the mass M' [Ton/sec]) the relativity phenomena inside it and the opposite Forces developed at the orifice.
   Since $M^\bullet$ is the result of transformation-degradation and is present as mass we have that in the above equation, describing transience at the outlet from the tank, it represents a system inside which the velocity of the light is reduced from c to $c' = \sqrt{c^2 - v^2}$ and the time is subject to delay, in respect of the time inside the tank (as a system) where the velocity of the light is c.
   Around the system $M^\bullet$ there is a field of energy $M^\bullet \cdot v^2$ which with its compression over the orifice "A" produces the Dynamic Force whose value results about twice the Static Force
   The introduction of a flow of mass $M^\bullet$ (in relativistic conditions) endowed of kinetic energy released by gravitational transformation-degradation and the presence of the Energy Field $M^\bullet \cdot v^2$ over the field of Ether/ESF is polarizing the direction of absorption at v velocity by the Ether of the Kinetic Energy belonging to $M^\bullet$ which by consequence assumes the velocity v and from that point on, mass of density ρ in liquid status carries on at constant velocity v .
   The whole phenomenon should happen in absence of friction but this is not possible since the flow of the mass in liquid status comes out of an orifice creating turbulence and friction and moves inside the air which is also mass and produces further turbulence and friction, furthermore the liquid jet cannot move horizontally since is also subjected to gravity which gradually influences the direction of movement which changes and follows a parabolic curve of fall.
   Note: as we know relative movement between masses acts on the atomic surfaces of the same (coming in contact) and forces them to transform some of the kinetic energy belonging to the atoms into Heat which comes out of the mass as dissipation.
   Nevertheless when movement is between mass and the Ether/ESF or when energy as mass energy in the status of Heat moves between the atoms of a mass, or as dissipation moves in the Ether/ESF there is no friction.

   If we take into account the effects following the above phenomenon (see drawing above) which can be caused by movement of the liquid against the borders of the orifice, by the turbulence of the jet, by movement inside the air or inside a conduit etc, we enter the field of practical hydraulics in which movement and therefore transfer of a liquid system from a point in space to another during a time interval, being subject to contact between masses in relative motion, cannot take place without loss (caused by friction) of part of the kinetic energy belonging to the system.

Comment: this application of "relativistic" concepts to everyday phenomena can be highly controversial, but what induced my mind to recur to this personal original attempt was the aim of giving an acceptable explanation to a phenomenon concerning the flow from an orifice on the side of a large reservoir, which at present is inconclusively justified.

   COMMENTS: I accept the fact that the phenomenon called "water hammer" (coup de belier) can be considered an extension of the above exercise, but cannot be solved extending the physical approach shown above.

   The reason being that in my exercise the movement of mass considers mass going through an orifice (as shown) and since there is no long pipeline (as is the case of the "water hammer") even if there is accumulation of kinetic energy inside the tank it results quickly dispersed through turbulence and the phenomenon of accumulation of energy at the orifice during shutting can be (up to a point) overlooked.

   The presence of a pipeline, then, when stoppage at the outlet occurs gives rise (through elastic compression at the orifice) to accumulation of kinetic energy that temporarily becomes mass-energy equivalent.

   The phenomenon (water hammer) is not instantaneous and is more evident at the orifice when the time of closure $\Delta t \to 0$ investing the compressible (elastic) interstitial substance between the atoms of the liquid belonging to a long conduit, which (atoms) do not have opportunity to release quickly (through turbulence) their kinetic energy, and is associated with gradual loss of the said kinetic energy along a succession of fast cyclical internal transformations-degradations in which KE through turbulence (internal frictions) is continuously transformed into Heat and dissipated.

   Nevertheless this is not all since to reduce elastic compression is frequently used what is called " a vertical oscillation tank" where internal turbulence and friction still reduce the excess kinetic energy.

   We then have that inside the tank during the phase of upward oscillation an additional phenomenon transforms kinetic energy into equivalent mass-energy (M_{ESCM}) which is a degraded status of the mass-energy permanently stored inside the mass, whereas during the oscillation downwards, KE is regenerated through gravitational transformation of mass-energy M_{RM} (neutron mass-energy) contained in M.

   (Consult my papers ruggeri5 and ruggeri6 pg1 on General Science Journals).

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