the general science journal

Motion is Relative to the Universe but Inertia is not

Based upon GravitoMagnetism and the Coriolis Gravity Theory

Thierry De Mees

e-mail: thierrydemees@telenet.be

Based upon the Gravito-Magnetic Theory it is clear that motion can be defined very precisely: the presence and the amplitude of the (gravito)-magnetic component at some place is the very proof of relative motion of an object. Hence, each motion cannot but being relative to the rest of our Universe. On the other hand, inertia can be proven to be not relative to the rest of our Universe, by deduction from the elementary process of force generation, which is found in the Coriolis Gravity Theory, which theory is a fundamental theory of forces and which is entirely compatible with the Gravito-Magnetic Theory. This proves that Mach's Principle (Mach's conjecture) is absurd.

1. The Heaviside Equations for Gravity (= GravitoMagnetism)

At the end of the nineteenth century, the engineer Oliver Heaviside proposed the gravitational equations as a copy-paste of the electromagnetic laws. This is called the Gravito-Magnetic Theory (or the Maxwell Analogy for Gravitation, or the Heaviside Gravitation Theory, etc…).

The equations (1) to (5) form a coherent set, similar to the Maxwell equations. Electrical charge q is substituted by mass m, magnetic field $\boldsymbol{B}$ by G*yrotation* $\boldsymbol{\Omega}$ (the magnetic-like field of gravity), and the respective constants as well are substituted (the gravitation acceleration is written as $\boldsymbol{g}$ and the universal gravitation constant as $G = (4\pi\zeta)^{-1}$. We use sign $\Leftarrow$ instead of = because the right hand of the equation induces the left hand. This sign $\Leftarrow$ will be used when we want to insist on the induction property in the equation. $\boldsymbol{F}$ is the induced force, v the velocity of mass m with density ρ. Operator $\times$ is used as a cross product of vectors. Vectors are written in bold.

$$\boldsymbol{F} \Leftarrow m\,(\boldsymbol{g} + v \times \boldsymbol{\Omega}) \tag{1}$$

$$\nabla\ g \Leftarrow \rho / \zeta \tag{2}$$

$$c^2\,\nabla \times \boldsymbol{\Omega} \Leftarrow \boldsymbol{j} / \zeta + \partial \boldsymbol{g} / \partial t \tag{3}$$

where $\mathbf{j}$ is the flow of mass through a surface. The term $\partial\boldsymbol{g}/\partial t$ is added for the same reasons as Maxwell did: the compliance of the formula (1.3) with the equation : $\text{div}\ \boldsymbol{j} \Leftarrow -\partial\rho / \partial t$

It is also expected $$\text{div}\ \boldsymbol{\Omega} \equiv \nabla\,\boldsymbol{\Omega} = 0 \tag{4}$$

and $$\nabla \times g \Leftarrow -\partial\,\boldsymbol{\Omega} / \partial t \tag{5}$$

All applications of the electromagnetism can from then on be applied on gravitomagnetism with caution. Also it is possible to speak of gravitomagnetic waves.

In many of my former papers, I have demonstrated *ad nauseam* that the Heaviside equations solve all the known gravitational cosmic issues, as far as the observation allows to identify and verify them. Moreover, they are to be considered as being very close to the Einstein's Relativity Theory, but way more easy to work with because the Heaviside equations form a linear theory.

2. Motion is relative to the Universe

From electromagnetism, we know that every motion of charged particles or objects causes a magnetic field. The same occurs with the Heaviside equations [1]. Every time that a particle moves in an external Newtonian gravity field (originated by any other object), that magnetic field is generated. In electromagnetism and in gravitomagnetism we represent it as a circular field about the direction of motion of the object. With rotating objects, it is also clear that magnetic fields are created. Indeed, all particles at a certain radius from the axis of rotation have a unique velocity and are moving against all the other particles of that object.

How to calculate the gyrotation vector of a particle? Since gyrotation only occurs when there is a relative motion between a Newtonian gravity field and a particle, it follows that the vector sum of the Newtonian gravity fields of the Universe, except the enquired particle itself, fully determines the gyrotation vector of the enquired particle.

The consequence is that a particle is in absolute rest if that gyrotation vector sum is zero. Practically however, one can define a local absolute rest if the considered particle, object or system, has a low gyrotation field. This allows us to study subsystems within a certain order of precision, determined by the system where it is a part of. This approach allowed me to find a link between the solar motion within the Milky Way and Mercury's perihelion advance [2]. Indeed, the solar system's motion in the Milky Way causes a Lorentz force for gravitation upon the solar system, caused by the Milky Way's Newtonian gravity field.

3. Deduction of the Coriolis Gravitation Theory from Gravitomagnetism

Forces are caused by a Coriolis effect between particles. I proved this by applying the law of Newtonian gravity and the law of gyrotation (together they form gravitomagnetism) to the Sun in the following manner [4].

Let a particle be represented by trapped, circular light. Let 'gravitons' (made of light) orbit about that particle and let the orbit be widening with time. The 'graviton' can approach another particle and interact with it. That results in a Coriolis effect $2c\times\omega$ between the 'graviton' and the spinning particle, and the obtained acceleration perfectly corresponds to the Newtonian acceleration. This is the first action occurring from a graviton.

The second action that occurs is an interaction of a radial 'graviton' that is leaving a particle, with another spinning particle. The resulting interaction, which we call 'force' is one that is perpendicular to both the graviton's radial velocity vector and the particle's spin vector that was hit. That results in a Coriolis effect $2c\times\omega$ between the 'graviton' and the spinning particle, and the obtained acceleration corresponds to an induction of rotation. When gravitons are leaving a particle in radial way over the whole circumference, we find the following relationship [4]: $(2\pi R/R)(2c\times\omega)\Leftarrow Gm/R^2$.

This is the second possible action occurring from a graviton.

When applying these two effects to the global Sun, I found a physical relationship between the Gravitational Constant and the Sun's dynamics. It appears that for the Sun, the following relationship between the solar parameters exists [4], [6]:

$$\upsilon_{eq} \Leftarrow \frac{G m_{Sun}}{2c\, R_{eq}^{\,2}} \qquad (6)$$

Herein : $G = 6.67\text{x}10^{-11}\ \text{m}^3\ \text{kg}^{-1}\ \text{s}^{-2}$,
$c = 3.00\text{x}10^{8}\ \text{m s}^{-1}$
and for the Sun, $m_{Sun} = 1.98\text{x}10^{30}\ \text{kg}$
$R_{eq} = 6.96\text{x}10^{8}\ \text{m}$.

and υ_{eq} is the according solar rotation frequency. The arrow expresses an unilateral validity.

Based upon the stellar lifecycle, I found an extrapolation of the apparent unilateral direction of the validity of eq.(6). I stated that, based upon the fundamental gravitomagnetic laws that are fully compatible with eq.(6), this equation should be valid for any active star [5].

The high profit of the Coriolis Gravity Theory is that any force can be expressed as a Coriolis effect, unveiling the forces' mechanism, because a Coriolis effect gives a pure common mechanical trajectory of the 'graviton' with the spinning particle, which results in an acceleration of both the 'graviton' and the particle. The entity 'force' is no mystery any more.

4. Inertia is independent from the remaining Universe, hence Mach's principle is false

If we want to express inertia in terms of the Coriolis Gravity Theory, which would be the ultimate concept to unveil the mystery of accelerations and forces, and which very probably is the fundament of all accelerations and forces what-so-ever, we have to consider the following.

A forced displacement at relativistic velocities of a particle gets the following effect: the orbiting 'gravitons' about the particle undergo a Doppler effect, so that orbital 'graviton' paths are becoming closer. Some of them, depending from the particle's velocity, are overruling each-other, causing an interaction between several orbits, which can be seen as a Coriolis effect.

A forced, accelerating displacement of a particle means that the orbiting 'gravitons' about the particle undergo a continuously increasing Doppler effect, so that 'graviton' orbits are overruling each-other more and more, and much of the particle's spin even gets overruled by its own 'gravitons' [4]. The interaction between the orbiting light (gravitons) and the spinning particle itself causes a Coriolis effect, which reflects the concept of inertia as a counter-acting 'force'.

Mach's Principle, which links the whole Universe to the inertia of a particle, is a philosophy that has no physical grounds. It would have been forgotten since long if Einstein wouldn't have been interested by it. Contrarily to Einstein's conviction, inertia must be measured with respect to itself, and not with respect to something else.

5. Conclusion

The theory of Gravitomagnetism forms a strong evidence of the relativity of motion with regard to the whole Universe. This means, for a certain object, that the velocities and the accelerations of the rest of the Universe rule the gyrotation of the observed object.

On the other hand, when one goes more into detail by using the Coriolis Gravity Theory, which rules the fundaments of all the existing elementary forces, it appears that inertia is fully determined by the particle itself, and not by the rest of the Universe. Hence, Mach's Principle is false.

References

[1] De Mees T., "Analytic Description of Cosmic Phenomena Using the Heaviside Field", Physics Essays, Vol. 18, No. 3 (2005).

[2] De Mees T., "Mercury's Perihelion Advance is Caused by Our Milky Way", General Science Journal (2007).

[3] De Mees T., "Mass- and light-horizons, black holes' radii, the Schwartzschild metric and the Kerr metric", General Science Journal (2006, upd. 2010).

[4] De Mees T., "Is the Differential Rotation of the Sun Caused by a Graviton Engine", General Science Journal (2010).

[5] De Mees T., "On the Gravitational Constant of Our Inflating Sun and On the Origin of the Stars' Lifecycle", General Science Journal (2010).

[6] De Mees T., "The Discovery of the Gravitational Constant as a Specific Stellar Property Simplifies the Description of Gravity", General Science Journal (2011).