The Gravito-Magnetic Inflation of Rotating Bodies and the Nature of Mass and Matter

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Gravito-magnetism consists of the Newtonian gravity and *gyrotation*, which is totally analogous to magnetism. This model has successfully explained an important number of physical and cosmic phenomena [1]. One of the most striking predictions is the possibility of gravitational repel by objects with like-oriented spins. I found that the sign and the amplitude of the effective gravity between particles is ruled by the spin-orientation of particles [2]. In [3], I emphasized the topological values of the gravitational 'constant' *G* inside the spinning Earth, based on its internal *gravito-magnetic* field. Also, I proved that the spin-orientations inside spinning bodies consequently provoke the inflation of these bodies, as suggested by the supporters of the Growing Earth Theory. I also showed why the gravitational constant is varying locally and I prove that, although the *gravito-magnetism* allows gravitational attraction as well as repel, the particles in rotating bodies will preferentially form distributions that are globally attractive. This explains why masses have never been found to be repulsive [3]. I deduce here a new definition for "mass" as a vector, and conclude that the gravitational constant's value is the sum of the orientations of the elementary vector-masses while taking their spacing into account. Moreover I find why the gravity force is so weak and why cohesion forces are so large.

1. Introduction

Considerable publicity was made by Neal Adams in 2008, who showed that the plate tectonics theory (PANGEA) is wrong and that the Earth is instead growing, from a small proto-Earth to the Earth of today [5]. Also Mars is growing and the Sun as well. His very convincing explanation, well documented by video, brought me to progress on my theory regarding *gravito-magnetism* [1].

What made the Earth grow? Is it still growing? How about other heavenly bodies? It is the purpose of this paper to unveil these questions through *gravito-magnetism*.

Hereafter, we will see how the Earth's rotation can also affect the Gravitational Constant value.

1.1. Gravito-magnetism

Mindful of the previous successes of gravito-magnetism in explaining cosmic phenomena, which I described in a former paper [1], this paper again just applies a property of *gravito-magnetism*.

Rotation and the motion of bodies create fields and forces in addition to the Newtonian gravity. I call this second field *gyrotation*, which is the 'magnetic'-analogue equivalence in gravito-magnetism and which is responsible for the flatness of our solar system and of our Milky Way. It also engenders the prograde orbit of the planets and the stars in their system and the constancy of the star's velocity in disc galaxies. It explains the hourglass shape of some supernovae as well.

From my earlier paper [1] , I found the equations for *gyrotation* $\vec{\Omega}$, the 'magnetic'-analogue equivalence in gravito-magnetism. Similarly to magnetism, which is the field that occurs when a electrical charge moves (or rotates), gyrotation is the field that occurs when a mass moves (or rotates). The properties of this field suffice to explain the inflation of rotating bodies.

The external gyrotation field is given by Eq. (1) and is represented in Fig. 1, wherein $\vec{\omega}$ is the spin velocity of the object, $\vec{r}$ the first polar coordinate, $\vec{\omega}\bullet\vec{r}$ a scalar vector product, equal to $r\,\omega\cos\alpha$ with α the second polar coordinate ($\alpha=0$ at the equator), R the radius of the object and m its mass.

$$\vec{\Omega}_{\text{ext}} \Leftarrow -\frac{G\,m\,R^2}{5c^2\,r^3}\left(\vec{\omega}-\frac{3\vec{r}\left(\vec{\omega}\bullet\vec{r}\,\right)}{r^2}\right) \qquad (r\geq R) \tag{1}$$

Eq. (1) can be found analogically to the calculation of the magnetic field of an electric dipole (a closed current loop), where the magnetic field is replaced by the gyrotation field and the electric charge by mass [8].

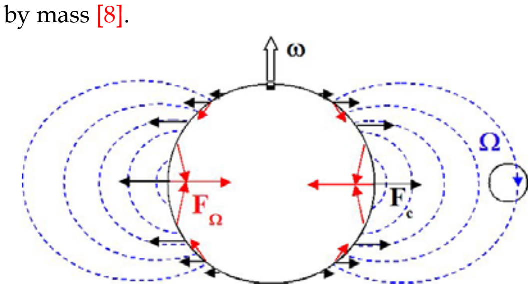

Fig. 1. A rotating body provides external gyrotation $\vec{\Omega}$ that has an inverse flow of the body's rotation. Attraction of the orbiting body occurs due to the equivalent Lorentz force [8]. Surface gyrotation forces are indicated F_{Ω} and centrifugal pseudo forces F_c.

It is amazing how the gyrotation fields act. The analogy with electromagnetism is fully allowed, and the Lorentz force for gravity $\vec{F}_{\Omega}$ is applicable for a body with mass m_2 that travels or rotates in the gyrotation field $\vec{\Omega}$ of the spinning mass m.

$$\vec{F}_{\Omega} = m_2\left(\vec{v}_2\times\vec{\Omega}\right) \tag{2}$$

Prograde orbiting objects get attracted and retrograde orbiting objects get repelled by the Lorentz force. But also at the surface of the spinning body, gyrotation forces occur by the interaction of the surface gyrotation field and the object's surface velocity. In previous papers [1], I deduced that the faster the body spins, the stronger the Lorentz gyrotation forces act inwards the body nearby the equator, up to the latitude of 35°16′, allowing fast spinning stars to not totally fall apart.

1.2. Opposite Spins Attract, Like Spins Repel

I also deduced [1] that due to the Lorentz force for gravitation acting upon the external gyrotation fields of spinning bodies, the following occurs, due to the mutual external gyrotation fields that both interact with the other body's surface (and internal) velocity. Bodies with opposite oriented spins will attract and bodies with like-oriented spins will mutually repel (Fig.2). This is valid for bodies, molecules, atoms and for any particle with a spin. In this paper we will generally speak of "particles".

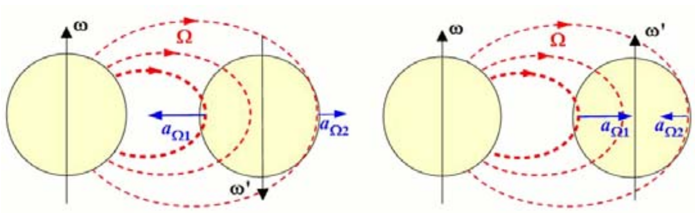

Fig. 2. Due to the Lorentz-force for gravity, bodies with opposite-oriented spins will attract and bodies with like-oriented spins will mutually repel.

The conclusion above is of utmost importance to fully understand the working of gravity at all levels and the definition of mass and matter.

2. Internal Gyrotation Field of a Rotating Body

As explained in my paper [1], the gyrotation $\vec{\Omega}$ of a rotating body provides a magnetic-like field that acts internally as well as externally to the body upon moving masses.

For a sphere, like the Sun, the Earth or Mars, its value inside the body, simplified for an uniform density, is given by [1]:

$$\vec{\Omega}_{\text{int}} \Leftarrow \frac{3Gm}{c^2 R^3}\left(\vec{\omega}\left(\frac{2}{5}r^2 - \frac{1}{3}R^2\right) - \frac{\vec{r}\left(\vec{r}\bullet\vec{\omega}\right)}{5}\right) \qquad (r \le R) \qquad (3)$$

wherein the same symbols are used as in Eq. (1).

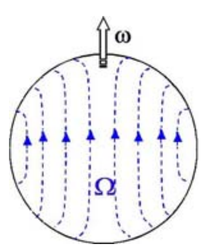

Fig. 3. Internal gyrotation equipotentials $\vec{\Omega}_{\text{int}}$ of a spinning body at a rate $\vec{\omega}$.

The internal gyrotation $\vec{\Omega}_{\text{int}}$ of a spinning sphere is represented in Fig. 4 for the component Ω_y that is parallel to the spin vector [3]. By comparing both Fig. 3 and 4 it appears that the component Ω_x is rather small compared with Ω_y (except at the sphere's surface) and will not affect the further reasoning of this paper. The reason will become clear during my explanations. The arrows in Fig. 4 are represented larger for higher amplitudes of the internal gyrotation.

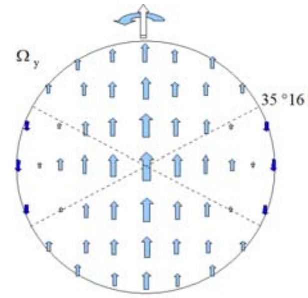

Fig. 4. Vector topology of the gyrotation along the spin axis of a spinning sphere. The spin axis contains the highest amplitude of gyrotation. At the latitude of 35°16′, the gyrotation becomes zero. At the equator, the gyrotation is inversed, and one gets a local increase of the attraction!

It appears from Eq. (3) that near the Earth's spin axis, the gyrotation will be strongly oriented like the spin. At the latitude of 35°16′, the gyrotation becomes zero, and around the equator, the gyrotation becomes even inversed near the surface.

3. The Preferential Orientation of Particles under a Gyrotation Field

The most important elementary particles have a spin. When these particles are not preferentially but randomly oriented, six main orientations are possible, like the six sides of a dice, or any linear combination of them. But I will show below that when a gyrotation field acts upon the body, an internal spin reorientation will occur over time, parallel to the ambient gyrotation orientation. Although initially, a precession upon the particle's spin will occur, but because the particles are not to be considered as 'hard' objects, their internal dynamical structure will be able to swivel. Under the external gyrotation field, there will be an increasing number of particles whereof the spin vector will swivel.

In Fig. 5, several relevant cases of elementary particles are shown (as rings) that are in an internal gyrotation field and undergo a Lorentz-acceleration

$$\vec{a}_{\Omega} = \vec{v}_i \times \vec{\Omega}_{\text{int}} \qquad (2)$$

wherein $\vec{v}_i$ is the rotation velocity of the elementary particle and $\vec{\Omega}_{\text{int}}$ the interior gyrotation field of the spinning object.

The swiveling acceleration is then given by Eq. (2) and the inertial angular moment of the elementary particles will in the first place cause a precession of the particles' spin vector.

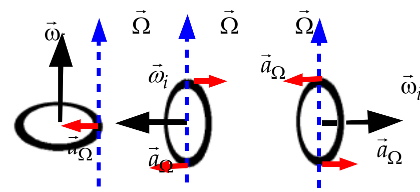

Fig. 5.a.b.c. Three situations of spinning particles at a spinning rate $\vec{\omega}_i$, under a gyrotation field $\vec{\Omega}$. In the cases 5b. and 5c. there occurs a swiveling of the particle towards a like orientation as the ambient gyrotation's direction, due to an acceleration $\vec{a}_{\Omega}$.

In Figs. 5b and c, the particles will swivel their spin vector until the gyrotation field's orientation; the particle in the Fig. 5a will not swivel, since its acceleration is oriented inwards the particle.

It follows that after time, the distribution of particles will not maintain random, but instead, one direction will be preferential, in the same way as the gyrotation distribution Ω_y of Fig. 4. Thus, this figure also shows the distribution of the density decrease (due by repel and so, expansion) inside the Earth. Remark that the distribution Ω_x is not relevant because of the continuous rotation of the Earth whereby the gyrotation orientations rotate as well, parallel to the equatorial plane.

In the light of Fig. 4 and Eq. (3) it is clear that nearby the Earth's spin axis, the particles' spin will be strongly oriented like the Earth's spin, more than elsewhere in the sphere. At the latitude of 35°16′, the particles' spin is not altered, which means that the spins' orientations have remained random. At the equator, the particles' spin can even become inversed, and one gets a local increase of the global attraction (large zones with opposite spins)!

4. Why Gravity Generally Appears to Attract

4.1. The Early Earth and Its Particles' Orientation

From the general point of view, one could say that the particles in the early Earth probably were oriented randomly, because the spinning did not modify the particles' orientations yet. But the Earth was formed from a certain physical process. Although I am won for the idea of a solar protuberance that formed the Earth [4], any other process could result in a certain orientation distribution of the particles.

It will be shown below that there always occurs attraction between particles.

4.2. Why the Preferential Orientation of the Earth's Particles is Attractive

Why is the preferential orientation of the Earth's particles attractive? Imagine several particles side by side that are randomly oriented upwards or downwards, say, ↑↓↓↑. As we saw earlier [1] [2], opposite oriented particles attract and like oriented particles repel. According to gravito-magnetism [1], the first particle at the left attracts the second and the third particle, the second particle repels the third one, but attracts the first and the fourth ones, and so forth. The particles that are oriented differently, → or ← , do not affect this reasoning because they don't interact much with ↑ and ↓ (thus, the reasoning for ↑↓↓↑ is similar to that of, say, ↑←↓←↓→↑). The final situation of the example is given by a void between the second and the third particle, like ↑↓ ↓↑. Between the two downwards oriented particles of this example, the space between them increase and some room is created for another particle to fill it. We have a probability of more than 1/6 that this will be a ↑ , because ↑ is attracted by ↓ , resulting in a double attraction (left side and right side). In this example, we obtain a higher probability for ↑↓↑↓↑, which globally is an attracting group, noted as ▲ , that is oriented upwards. Remark however that the global orientation is only of an amplitude ↑ , for the five particles. The same reasoning is possible for groups: ▼▲▲▼ will result in ▼▲ ▲▼ , and then in a higher distribution probability of ▼▲↓▲▼ or ▼▲▼▲▼, which here gives a downwards super-group. These super-groups on their turn form hyper-groups the same way. However you look at it, one always gets a majority of attraction-oriented compositions, in case of mobile particles like in the Sun or like most of the actual Earth. But even hyper-groups will get an amplitude of only ↑ , which suggest the reason why the external gravitation force is so small, while the cohesion forces in matter are so large.

Now we know why the heavenly bodies are attractive, despite the fact that gravito-magnetism allows both attraction and repulsion of particles. We also found the first reason why the Gravitational Constant isn't identical everywhere.

5. Gravitational Consequences of the Preferentially Like-oriented Particles

Let's recall the main features of like and unlike spinning elementary particles:

1. Gravity between elementary particles can be attractive as well as repulsive.
2. Consequently, the 'universal' gravitation constant isn't universal at all but 'local' and its value depends from the degree of like or unlike orientations of hyper-groups of particles in the bodies.
3. Rotating (spinning) bodies get steadily more like-oriented particles and consequently, steadily lower attracting and higher repelling values of the 'local' gravitation constant.
4. Rotating (spinning) bodies inflate and their density decrease.
5. The gravity of an object, containing ideally random-oriented particles doesn't get any global external gravitational effect! In other words, if there is no preferential orientation of the particles, no global gravitational attraction (or repel) will occur!
6. Microscopic and elementary masses have now gotten a vector propriety because the attraction or repel between bodies only depends from the mutual (global and individual) spin orientation of these bodies and of their particles.
7. The parameters of the gravitational attraction and repel of bodies are their masses (as far as they can be regarded as absolute values), their distance and their mutual orientation (also expressible by the 'local' gravitation constant of each of the bodies, as vectors).
8. The grouping of the particles' orientation of spinning bodies make them preferentially attractive, but with a small attraction amplitude, which explains the high cohesion forces of matter and, at the same time, their low gravitation forces.

6. Matter, Mass, and the Gravitational Constant

Matter can globally be non-spinning and the internal particles can remain "frozen" in their original arbitrary spin-orientations, so that they are (theoretically) neutral and insensible to gravity. In other words, it appears that the rate of attraction or repel depends on the elementary masses' spin-orientations and of the gravitational constant G, but it also appears that there possibly doesn't exist any scalar mass. This point of view directly follows from the definition of matter as "trapped light".

Since mass however is regarded as a matter-related quantity, not as a quantity of attraction, the rate of attraction or repel should ideally be treated by the gravitation constant. One should find a description that's keeps the original value of the word "matter" as "mass", and keep the gravity constant as the relationship between the vector-masses.

Since mass really behaves as a vector with respect to gravity, the more correct description is the following.

I can consider Newton's law as a Coulomb-like law, but where the masses become vectors, defined by the sum of their elementary spins, and where the constant *G* only defines the 'normalized elementary gravitational constant', this is, the value that is obtained when two like-oriented or opposite-oriented elementary particles are considered. The resulting equation then avoids regardomg the 'gravitational constant' as the variable.

$$\vec{F} = G_{\text{norm}} \sum \frac{\vec{m}_i \bullet \vec{m}_j}{R_{ij}^3} \vec{R}_{ij} = G_{\text{norm}} \sum \frac{m_i\, m_j \cos(\alpha_{ij})}{R_{ij}^3} \vec{R}_{ij}$$
$$= G_{\text{norm}} \sum \frac{\text{proj}(M_i) \cdot \text{proj}(M_j) \cdot \cos(\alpha_{ij})}{R_{ij}^3} \vec{R}_{ij} \tag{4}$$

wherein the used symbols speak for themselves according Fig.5: $\vec{R}_{ij}$ is oriented in the direction of the y_{ij}-axis and $\vec{m}_i$ and $\vec{m}_j$ are two-dimensional projections of the corresponding masses $\vec{M}_i$ and $\vec{M}_j$ in the x_{ij}-z_{ij}-plane.

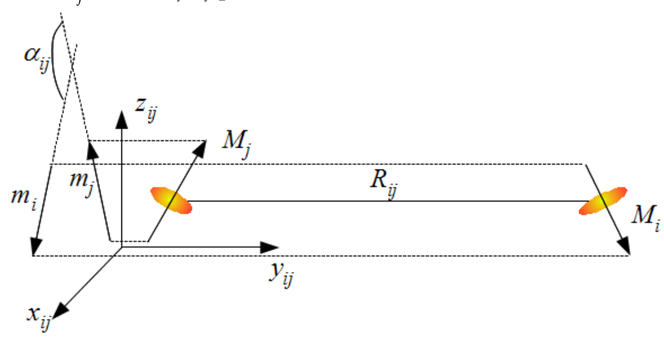

Fig. 6. Definition of the attraction or repel between two elementary masses $\vec{M}_i$ and $\vec{M}_j$ as the two-dimensional scalar vector product of the projections $\vec{m}_i$ and $\vec{m}_j$ in the x_{ij}-z_{ij} –plane, according to Eq. (4).

The value of G_{norm} is then defined by the structure of a set of two particles. For larger objects, G_{norm} is defined by the average hyper-group structure.

7. The Nature of the Gravitational Interaction

In a former paper [2], I found strong evidence that the Sun's rotation is caused by a Coriolis effect between escaping light and the Sun's body. Moreover, I could distinguish tangential (orbiting) and radial escaping "light" (E-M-waves). Although the orbiting "light" (are they gravitons?) doesn't totally seem plausible, they appear in the mathematical description of the physical properties of the Sun. Strikingly the Sun's frequency is tightly bound with its mass, radius and gravitational constant! [2]:

$$\upsilon_{\text{eq}} = \frac{G\, m_{\text{Sun}}}{2c\, R_{\text{eq}}^{\;2}} \tag{5}$$

whereby I found that Eq. (5) is caused by a Coriolis effect.

As I have put it in [2], for two particles δ_i and δ_j of "trapped light", the total possible number of intersections between the escaping light of one particle (radius R_i) with the global second particle (radius R_j) is given by

$$\left(2\pi R_j\right)/R_j\ . \tag{6}$$

Indeed, the Coriolis equation $2\vec{\omega}_j \times \vec{v}_i = -\vec{a}_j$ is compatible with Eqs.(4), (5) and (6).

8. Conclusion

The modification of the scalar mass-model into a vector mass-model is mandatory for understanding the gravitational attraction and repulsion between elementary particles, especially under an external influence of a gyrotation field, as caused in the Expanding Earth phenomenon. However, it doesn't reduce the validity of Newton's gravitation law for massive bodies at low velocities.

The angular momentum of the elementary particles must have an important role in our definition of the gravitational constant, groups of opposite oriented particles are cluttered and form global objects that attract from all sides, pseudo-randomly.

The Earth's surface's gyrotation field has a low component along the Earth's axis and a high component that rotates with the Earth (Fig.3), which results in a pseudo-random spin orientation of particles at the surface, and which forms a comparable attraction force all over the world.

In the section 5 above, many conclusions have been made already. The Growing Earth Theory can be explained by gravitomagnetism. The like spins of elementary particles cause gravitational repel and the unlike spin, attraction. Gyrotation fields, induced from the rotation of masses, orient these spins preferentially the same as the body's rotation, which results in the repel inside the body, and so, in its expansion. The consequence is that gravity doesn't always mean attraction, because it depends from the excess of orientation of particles in specific directions. The gravitational constant is not a constant at all but should rather be seen as a combination of spin orientations of the considered elementary masses, globalized over the Earth.

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