PRESS RELEASE

The discovery of the century: Gravitational waves finally intercepted

They were right under our nose but we couldn't see them because we were using and still use nowadays an inappropriate and expensive instrumentation or, in a more colorful language, an inadequate pair of gold-rimmed glasses.

But the most important and unexpected aspect is the inedited consequence coming from this fact. In effects, the one we can define the most important discovery of the century is nothing else than a little and hidden part of a true, shocking and unknown scientific explosion having inside of it very formidable scientific implications. Effectively, you will realize that only by talking about gravitational waves it's like we had talked about the little part of an iceberg, hiding underwater a frightful and powerful mass to be explored. Abnormal mass full of revolutionary consequences nearly cancelling the fact that finally we succeed in intercepting, obviously in experimental way, those elusive gravitational waves preconized by General Relativity and searched in vain by international scientific community still investing intellectual and economic resources in this research.

Those that seem to be foolish affirmations are instead demonstrated right in the first 26 pages of *The Unification of the electromagnetic and gravitational waves. The gravitational waves. The Antigravity. First Part* by Carlo Santagata & MyBoook Editor), available in italian language too (*L'Unificazione dei campi elettromagnetici e gravitazionali. Le onde gravitazionali. L'Antigravità*) that the reader can download for free from the editor website.

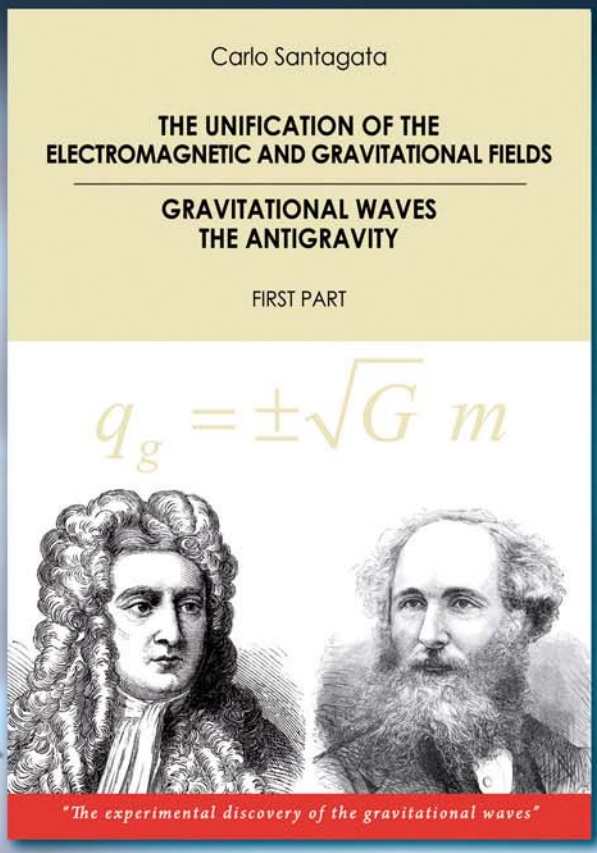
A few pages to convince that the gravitational interaction is not other than a particular aspect of the electromagnetic interaction of matter. That's demonstrated by the fact that a gravitational variation of the Earth-Moon dipole, just to make an example, involves a corresponding magnetic variation that can be detected with a common terrestrial magnetogram. Then it's easy to conclude that the magnetic terrestrial field constitutes an irreplaceable and formidable antenna for the gravitational waves coming both from our solar system and abysses of the cosmos so now we have the possibility to see the entire creation even through this *gravitational light*, that is electromagnetic.

But if this is true, and so if gravity is not other than a particular electromagnetic manifestation of matter, then we can conclude that is possible , with opportune equipment entirely electromagnetic,

To vary as we like the gravitational field surrounding any mass

And this opportunity is enormously stronger of the one to finally detect the gravitational waves. But wahat does that mean?

Nowadays we are able to fly thanks to helical propulsion (in presence of air) or using action and reaction principle applied in our advanced missiles. But if, as we say, the gravity is not other that an exclusively electromagnetic field, we can, with opportune equipment entirely electromagnetic, to vary the gravitational action that, for example the Earth, performs on anybody gravitating on its surface. The consequences of this fact are evident and immediate.



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The Unification of the electromagnetic and gravitational waves. The gravitational waves. The Antigravity. First Part
Publisher: & MyBook
160 pp.
Price: 35,00 €
ISBN: 9788865600368

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Newsbreaks articles

The enigma of gravity revealed

They say that Saint Joseph from Copertino, like many other mystics as also Padre Pio, during the ecstasy he wafted in the air, supported by a mysterious force that cancelled his weight. The Gospel says that Christ walked on waters of the Tiberiade lake, astonishing his disciples. Even other religions speak about levitation phenomena. The ufology instead tells us about flying discs using an unknown type of propulsion (probably electromagnetic). Science, with Newton, supports that the gravity holding us fixed on the Earth, is a force that attracts all the bodies, but the modalities with which it acts are a mystery completely comparable to that one of the said levitation. Newton himself, as he was not succeeding to explain the origin of the gravity, pronounced the famous phrase *hypotheses non fingo,* that is only a bitter renunciation to the intimate understanding of the phenomenon. Among other things he thought that the gravity could be led back to pressure differences in an untouchable aether that permeates all the Universe but this idea only remained a suspicion and nothing more. Things are not better at all with Einstein, who thought that gravity would consist in a deformation that a body produces in the *space-time* surrounding it. In fact, they did not succeed to understand the mechanism with which an abstract concept and exclusive product of the human mind (particular 4D geometry) can be deformed by a mass and then it constitutes, as an example, iron railroads forcing the Moon to turn around the Earth. Anyway, we can try to reach explanations on the deep nature of the gravity from religion, ufology or science, it still however remains an enigmatic mystery. And if that is true, then it's illusory to think about being able to modify it as we prefer, as we make for other forces of nature. But if instead we discover that the gravity is referable to magnetic electric fields that we better know and dominate, then we can think about being able to model it as we like. In such case exclusively electromagnetic equipment can increase, decrease or cancel the gravity that a mass exercises in a determined point of the space surrounding it. The demonstrations that these conclusions are more than correct are widely exposed in the book from the title **The unification of the electromagnetic and gravitational fields - the electromagnetic waves - the anti-gravity**. In particular the said unification concurs to finally and immediately intercept the elusive gravitational waves up to now searched in vain, and this fact constitutes a formidable test experience of its full validity.

The gravitational waves finally discovered and intercepted

Soon afterwards the advent of General Relativity (1916) they tried to intercept the gravitational waves thus like previewed from this theory but till now, although most considerable economic efforts made by the European and American scientific community, it has all turned out vain. It is better to explicitly say that the equipment for the relief of the gravitational waves has been planned right on the base of the physical characteristics of these waves the way they were foreseen by G. R., which, propagating themselves in the space-time and investing a body of mass m, they would deform it, in a certain way and it's just that elastic deformation they're attempting to find. Once assessed this experimental fact, only the problem of the unification of the relativistic gravity with the other known interactions would remain unexplained, fact that introduces big and unsurmountable problems up to now (Nobel Abdus Salam).

But if, as we support, the gravity is fully and totally referable to an exclusively electromagnetic fact, we immediately realize that these waves, in which we are totally dipped, they were just under our nose, and in order to find them, we only needed an instrumentation nearly offered for free by nature.

And that's easier said than done. If we consider any binary system (Earth-Moon as an example) the lunar orbit endures a gravitational variation when it crosses, as an example, the perigee. In fact in that point the

Earth-Moon distance is minimal and therefore, based on the formula of Newton, the gravitational force becomes maximum. It is easy to see that, in “concomitance” with said gravitational variation, a terrestrial magnetogram reports meaningful variations of the magnetic field that lets us to determine the time of revolution of the Moon around the Earth. Therefore, through the analysis of the said magnetogram, we are able to determine the frequency of the gravitational wave and from that, to go back to its wavelength. Then it is immediate to reach the conclusion that the terrestrial magnetic field constitutes a huge and irreplaceable antenna that lets us to intercept the gravitational (electromagnetic) hitting the Earth they come both from the solar system and from the depths of the cosmos surrounding us. Therefore it’s enough to study the variations of the terrestrial magnetic field in order to find the frequency of the gravitational waves that continuously hit the Earth.

And it is easy to see, still in the event of the said binary system, that it exists, as it’s known, also a terrestrial magnetic variation that has a period of 24 hours and 50 minutes, time coinciding with the one that Moon needs to reoccupy the same position regarding the Earth, and so resuming to exercise the same previous gravitational action (interval of the lunar tide). There is still an analogous magnetic variation of 24 hours that coincides with the time that the Sun needs to apparently resume the same spatial position regarding the Earth (solar tide) etc.

And what about the period of variation lasting eleven years of “the magnetic” storms the Sun endures (sunspot), period that practically coincides with the time of (“gravitational”) revolution of Jupiter around the Sun that is of 11.8 years?

Obviously in a simple introductory article like this, it is not possible to say more and therefore the Reader can read **The Unification of the electromagnetic and gravitational fields - the electromagnetic waves - the anti-gravity**.

To end let’s add that what now said not only corroborates the thesis saying that gravity is entirely referable to a pure and simple electromagnetic fact (itself constituting a natural and powerful step towards the gasped unification of all the known interactions) but these incontrovertible experimental replies, attesting and certifying the physical identity between gravity and electromagnetism, finally open the road to the possibility of being able to manipulate the gravity, by increasing, diminishing or cancelling it, with unimaginable and enormous consequences this involves for the technological progress of the entire humanity.

Carlo Santagata

THE UNIFICATION OF THE ELECTROMAGNETIC AND GRAVITATIONAL FIELDS

GRAVITATIONAL WAVES
THE ANTIGRAVITY

FIRST PART

& MyBook

"THE UNIFICATION OF THE ELECTROMAGNETIC AND GRAVITATIONAL FIELDS
GRAVITATIONAL WAVES - THE ANTIGRAVITY - FIRST PART"

Book published and distributed by: **& MyBook**
a trademark of **Caravaggio Editore**
Casella postale 325
66054 Vasto (CH) - Italy
www.andmybook.it
info@andmybook.it

Editorial Series: *Saggistica*
First Edition: December 2011

English translation by Domenico Santagata.

ISBN 978-88-6560-036-8

In memory of my unforgettable wife Anna

Preface

It is possible to show how the gravitational interaction is entirely recoductable to the electromagnetic one, by establishing a perfect biunivocal correspondence or equivalence between themselves and succeeding, besides, also in finding again (see formula (0.239) § 6) and to finally interpret the already known and never comprehended adimensional relationship [1, p. 593]

$$\chi = \left[\frac{e^2}{G \times m_p^2} \right] \simeq \frac{e^2}{G \times \frac{1^2}{N_A^2}} = \frac{\left(N_A\, e\right)^2}{G \times 1^2} = \frac{F^2}{G \times 1^2} = \frac{\left(F/1\right)^2}{G} = 1.23 \times 10^{36}$$

where e indicates the electron charge, G is the gravitational constant, m_p the proton mass, N_A is Avogadro's number and F the constant or Faraday's charge, all in the $\left[c.g.s.\right]_{es}$ system.

The adimensional relationship contained in squared parenthesis was set in evidence for the first time by the nobel Dirac[1] [2] in an attempt of unification of macro and microcosm (GUT). From the preceding relationship it follows that the constant G is given by

$$G = \frac{1}{\chi}\left(\frac{e}{m_p}\right)^2 = \frac{1}{\chi}\frac{\hbar C}{137\, m_p^2} = \frac{1}{\chi}\frac{\hbar C N_A^2}{137\left(1\right)^2} = 6.67 \times 10^{-8}\,[l^3 m^{-1} t^{-1}]$$

from what it is evincible that the gravitational interaction is exclusively atomic and electromagnetic.

To the fusion of the gravity and the electromagnetism (that can be pushed, as it will be seen, also to the other interactions) is added, once the intimate existing interconnections among the mentioned interactions are revealed, the exceptional and unpublished possibili-

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[1] Dirac instead of m_p^2 considers proton and electron product mass then he finds $\chi = 2.36 \times 10^{39}$.

ty to be able to realize, as described in the present note, also the following fundamental experiments:

1. experimental individualization of the gravitational radiation with the aid of new and appropriate instrumentation planned in base to the nature strictly electromagnetic of the gravity, kept account of the frequency, wavelength and power theoretically foreseen with the recognition, also visual, of the issuing gravitational dipole (see over);
2. production and receipt of gravitational in laboratory whose wavelength can have a range of ($\mathbf{l_G}$=[200÷5000] Km) and over, according to the instrumentation that is used, with emitters and appropriate receivers (see over);
3. ***planning and realization of devices able to vary the local gravity***.

The realization of said experiments and devices does not require exceptional economic investments. Besides, the theoretical forecasts of the present work finally seem to fully give reason for the result, to be honest, to the experiments that have already been developed in 1996, from the russian researcher E. Podkletnov (also see prof. G. Modanese, Bolzano University), that would have produced a 2% reduction of the weight of the objects [3]. These experiments have been performed with the machine that is described in the figure 1 (greater details are available on Internet by searching for "antigravity" [3]).

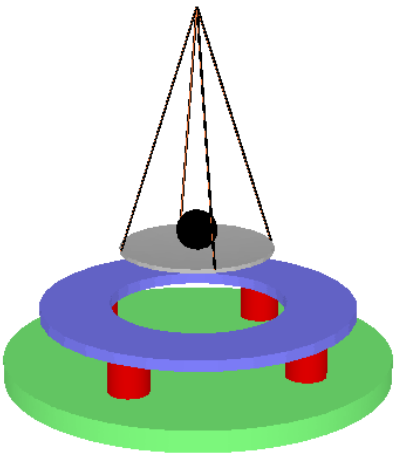

Fig. 1

The superconductor ceramic disk (in blue[2]), floating on the solenoids (in red), is set in rapid rotation (5.000 rpm). The black stone, in balance disc, reports the said diminution of weight.

According to Podkletnov this reduction would be caused by the ceramic superconductor placed in rapids rotation (5000 rpm) that is seen in the figure which, *by screening the gravity*, it would let decrease the object weight above it. Said object that, being constituted by a common stone, it would not obviously feel any magnetic effect obviously well present. These experiments, that also cought the attention of Nasa and BOEING, as it is known, don't have any valid theoretical base, in fact Podkletnov has declared to accidentally have discovered the said effect. The idea of the gravitational screening, that is not quantified by any formula and that comes out from an idea of Quirino Majorana (1920), has never been comforted by experiments made in such sense (on that matter you can take a look at § 7).

It is instead immediate to show that the said phenomenons are exclusively and fully placeable in an unexpected optic that is totally different from the overshadow screening (see § 7). In fact we can affirm with absolute certainty these phenomenons are fully comprehensible and this complete intelligibility also conducts in can be a very natural way to the planning of electromagnetic equipments producing a complete modulation of the local gravity.

This entirely springs from the unification of the gravity and the electromagnetism or, if is wanted, from the full comprehension of the intimate mechanism of the mysterious gravity !

About it, just to give an idea in a sort of anticipation, we can say that among the innumerable new formulas that are deduced in this work, we reach the unbelievable and unexceptionable unpublished relationship (0.325)

$$F_{Newton} = G\frac{M\,m}{d^2} = \frac{M}{m}\mathfrak{M}_m H_m = \frac{M}{m}\frac{\mathfrak{M}_m l_m}{d^2} i_m = \frac{M}{m} F_{Laplace}$$

[2] See ring of Rowland § 2 and followings.

which besides allows us to affirm that the Newton's gravitational force is equal to the product of the magnetic mass $\mathfrak{M}_m$ ***, function of the secondary mass*** m ***(see formula* (0.295)*), for the magnetic field*** H_m ***, produced by the dipole or gravitational couple*** $M-m$ ***, field given by the formula (1.320).***

Besides the analytical development of the term on the right $\frac{\mathfrak{M}_m l_m}{d^2} i_m$, known to be absolutely and exclusively electromagnetic (II[nd] Law of Laplace), thanks to the mentioned unification[3], it also univocally conducts to the formula of the Universal Gravitation of Newton. In addiction the simple relationship (1.277), tying the mass M to the electrogravitational charge Q, allowing to immediately translate the said unification in a much more furbished language, of the General Relativity (G.R.).

All these new relationships that, besides, allow the quantification of the smart gravitational intuitions, only qualitative, of W. Gilbert (1544-1603) and, very later, of J. C. Maxwell (1831-1879), they allow to project purely electromagnetic machines, ***that can increase, decrease or to annul the weight of an absorbed body in a gravitational field!*** *And it is not a case that the magnetic effects (generated above all from the rotating ring) are also well present in the experiments of Podkletnov. If there is something that these experiments show beyond every reasonable doubt is certainly the intimate, indisputable (and for the moment) slender bond existing between the electromagnetism and the gravity!*

To support these strong and unbelievable affirmations we can now mention different and immediate experimental comparisons finding nothing better in any other actual theory. If it is true that the force of Newton has a deep magnetic root, then all the planets of the solar system apply a magnetic (or gravitational) force to the Sun thanks to

[3] On purpose it is synthetically evocative to say that with the said unification we will succeed in giving body (or mass) to the ethereal (or spiritual) equations of Maxwells, well-known made of only electric and magnetic charges and, and we will succeed in giving spirit (that is electric and magnetic charges) to gravity, that is only made of material bodies or ponderal masses.

the said relationship (1.295), and this for the Principle of Action and Reaction. In addiction it is evident that these magnetic (or gravitational) actions, even for the eccentricity of every planetary orbit, they vary with the sinusoidal law that assumes the same maximum value whenever the generic planet recrosses the perihelion.

Without making any calculation, (only for the time being), we can immediately say that, because of the big preponderance of the mass of Jupiter in comparison to the one of all the other planets, the solar system can be assimilated, and this obviously in first approximate appeal, to the simple gravitational dipole Sun-Jupiter (orbit eccentricity **e**=0.04845), momentarily neglecting the magnetic effects of all the other planets. For this simple fact we can immediately say that the magnetic variations discovered on our star must have a predominant principal period of the same order of greatness as the revolution of Jupiter around the Sun that is notoriously of 11.8 years.

If it is considered that the period of variation of the sunspots (see Fig. 2 and 3)[4], an exclusively magnetic phenomenon, on average equal to 11.6 years, (see § 10), it does not take a lot for concluding that what is affirmed here is only apparently puzzling and unbelievable.

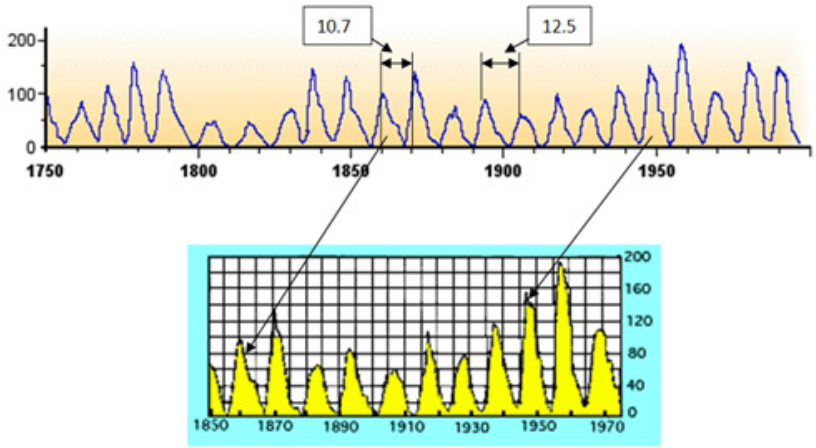

Fig. 2 e 3

[4] Take a look on the Internet “Solar cycle”.

We're going to deepen this matter even if it we are talking about it at the § 12. The Fig. 4 and 5 better put in evidence the characteristic indentation of the so-called solar cycles. In effects these diagrams bring on the y-axis a certain number of sunspots, Wolf's number, had in every solar cycle. These spots are counted with direct or telescopic visual observations and this is the motive for which very ancient data are available (Galilei, with his telescope, also studied the sunspots). And also from these figures is noticeable that the average period of these cycles is very close to Jupiter's period of revolution around the Sun.

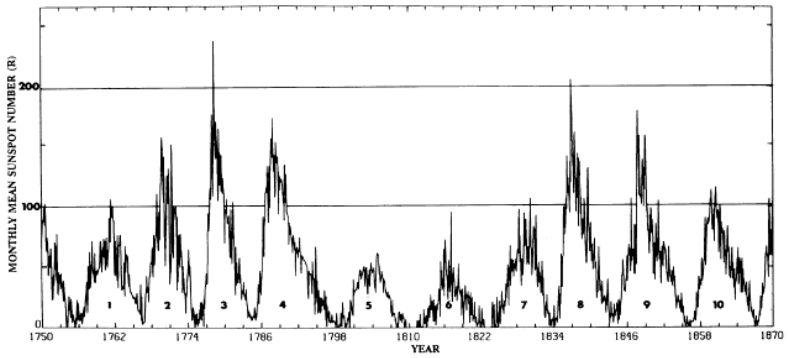

Fig. 4

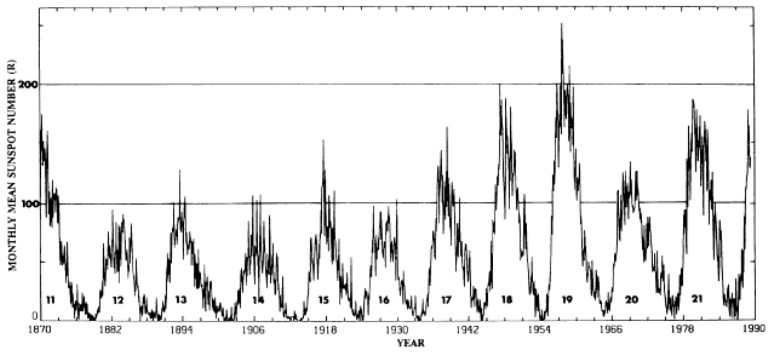

Fig. 5

On the other hand if it is true that gravity is not anything else than an electromagnetic demonstration of the matter then, as we are sustaining also with some precise formulas, to a gravitational variation it will correspond an electromagnetic variation and vice versa.

We can exactly say that, according to the Law of Universal Gravitation, every planet, applies in turn the force to the Sun

$$F_N = G\frac{M\,m}{d^2}$$

and we have already mentioned to its bonds with some magnetic greatness. Besides in this note it will be shown particularly that a body with gravitational mass m orbiting around to a body with mass M on an orbit of instant ray d it will practice on this last said a magnetic (and electric) induction given by the relation

$$B = \sqrt{\frac{m}{M}}\sqrt{\frac{m}{d^3}}\,.$$

So it's totally evident that a variation of the orbital distance d (all the planets describe elliptic orbits) it both behaves a variation of the gravitational force given by the relationship

$$\Delta F = -2\frac{G\,M\,m}{d^3}\Delta d$$

that at the same time is a variation of the said magnetic induction, equal to

$$\Delta B = -\frac{3}{2}\frac{m}{\sqrt{\frac{m}{M}}\sqrt{\frac{m}{d^3}}}\frac{1}{d^4}\Delta d = -\frac{3}{2}\frac{m}{B}\frac{1}{d^4}\Delta d\,.$$

The said vector, as we will better see later, it is applied to the barycentre of the central mass[5] M and it is perpendicular to the plan characterized by the orbit that m describes around the main mass, thus like synthetically represented in Fig. 6.

[5]When the peripheral mass in comparison to the central one is completely neglectable.

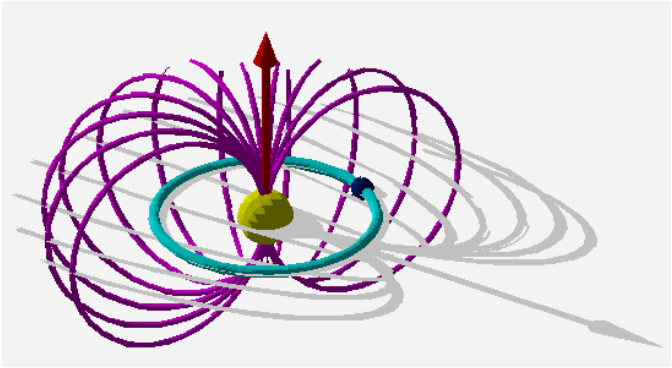

Fig. 6

If it is considered that all the planets of our solar system exercise said actions on the Sun, it will evidently be that the electromagnetic field that the Sun itself (it's due to the continuous thermonuclear reactions that feed it) endures some proportional alterations to the said actions.

In the Fig. 7, on the Y-axis, the total magnetic induction that the Sun endures from the nine considered planets in function of the time and this relatively to the period that goes from 1850 to 1920, thus as wil be better specified in § 12, excluding therefore all the other uncountable bodies of the solar system. The said induction has been calculated with the formula(0.295).

In any case, it has to be noticed that the main period of said variations (that evidently coincide with the relative gravitational cycles) is still nearly coinciding with that one of Jupiter, conclusion which immediately is reached, as we have already said, assimilating, in first approximation, the solar system only to the couple Sun-Jupiter.

Let's observe the indentations are caused by the gravitational action of several planets (or several magnetic inductions) above all of the inner planets which have a period of revolution shorter than the one of Jupiter. This is better appraised by watching Fig. 8 and 9. In the last one it is possible to identify the indentation produced by the planet Mercury, that has a period of 0.24 years.

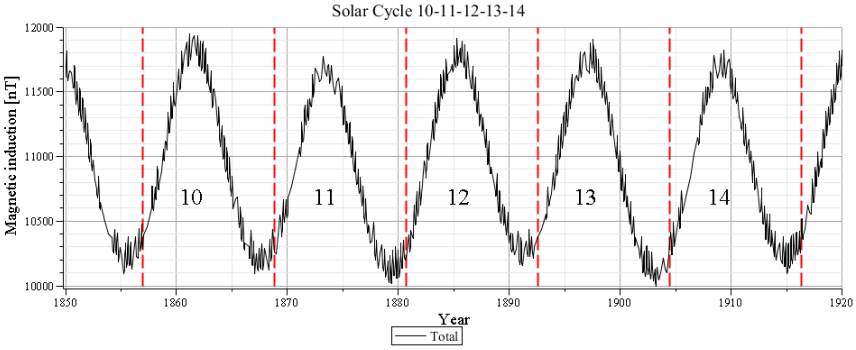

Fig. 7

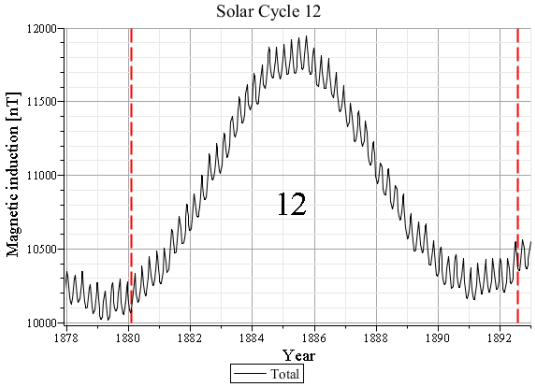

Fig. 8

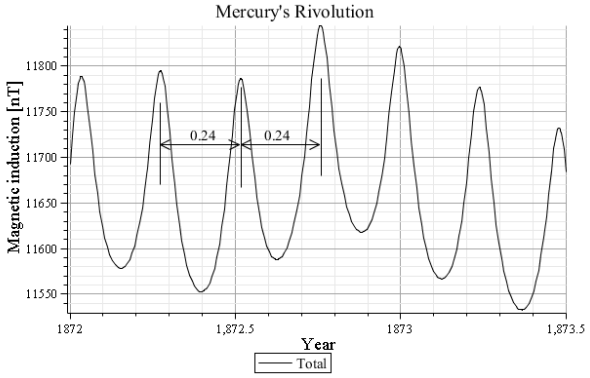

Fig. 9

Fig. 10 shows the theoretical cycle previewed (of magnetic induction) 23 and 24 still in progress.

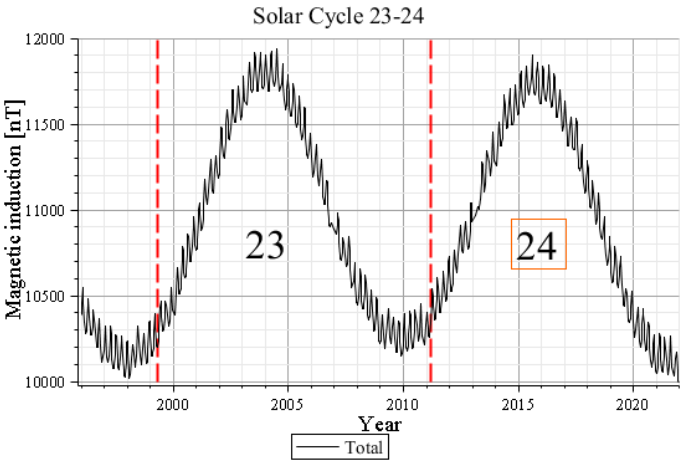

Fig. 10

These diagrams can be confronted[6] with those giving the number of the solar spots or Wolf's number as it is natural to think that this number is proporzional to the said magnetic induction. On the other hand it is known that the solar magnetic storms that, with a period very close to the one of Jupiter's revolution, systematically bang out planet, they are proporzional to the number of Wolf.

In particular, with the clarifications and distinctions said, Fig. 10, as an example, it can be confronted with Fig. 11 and 12 which show[7], besides the already passed cycle 23, also a forecast, completely statistics, with cycle 24 and, despite that, also this last one foresees, as it is showed, a period of the same order of greatness of the one of (gravitational) revolution of Jupiter around our Sun, without adducing any other physical explanation.

[6] With an opportune traslation along the y-axis and an opportune amplitude coefficient.
[7] Go on NASA website and look for "solar cycle".

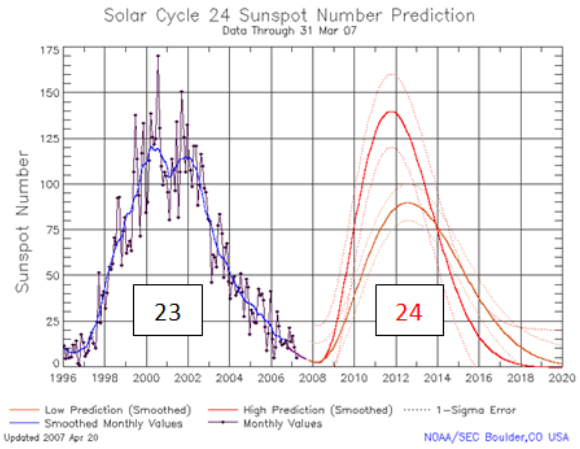

Fig. 11

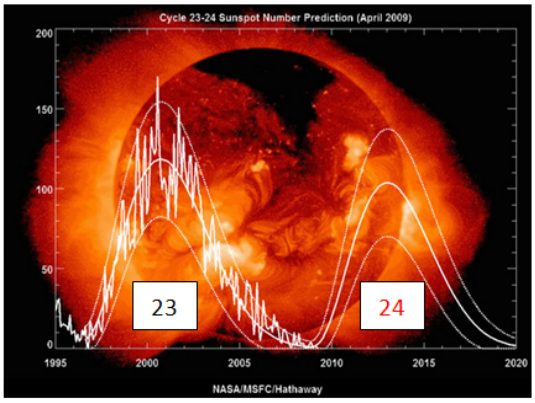

Fig. 12

About a possible impatient and rough comparison[8] between Fig. 10 and 11 or 12 it is observed how, by indicatively dividing for 100 the maximum magnetic induction of cycle 23, approximately equal to 12.000 $[nT]$, 120 is obtained and it is practically coinciding with the maximum number of solar spots had in such period.

To these advances has to be added the possible interpretation, brought back in 12 §, of the mysterious effect Hathaway & Wilson, discovered in 2006 [36].

[8] This argument deserves close examination that will be successively developed.

Talking about the important correspondences between the ***gravitational variations*** and the ***variations of the magnetic field*** quantified from the previous relations, we have to say that there is also a non neglectable possibility to finally and experimentally determine the frequency of the waves emitted from gravitational dipoles. About this argument let's anticipate that various Authors have assessed what follows.

1. The study of the magnetic solar field reports one of its variation (T. Sakurai [25]) having a period of 11.8 years (that exactly coincides with Jupiter period of revolution around the Sun). (Take a look at [23], G. (2004). "Jupiter's influence". *New Scientist*. Retrieved 27 24 September 2007 and [] Wilson, Ian. *I give periodic peaks in the planetary tidal forces acting upon the Sun influence the sunspot cycle*. Retrieved 2009-10-07. Thymus Niroma **The Cyclicity of Sunspots**, findable on the Internet).
2. Variations of the solar magnetic activity with a period shorter than eleven years (S.T. Fletcher [26]). The period found is approximately of 2 years, that one of Mars revolution is equal to 1.9 years.
3. B. Komitov [27] marks analogous variations with a period of approximately 29 years (Saturn's period of revolution is of 29.5 years).
4. A.N. Peistykh [28] finds a variation with a period of 84.6 years (the period of revolution of Uranus is of 84.01 years).
5. Variatons of 165-210 years are not missing (Neptun has a period of 164.8 years) and 240-270 years (Pluto have a period of revolution of 247.7 years) (M.G. Ogurtsov [29]). Then, it can therefore be said that magnetic variations in correspondence of the revolutions of almost the planets of the solar system are found. It is also obvious that the uncertainty of these measurements is caused by the simple fact they are done by considering the variations of the content of Carbon 14 found in the isotopes of cosmic origin hitting the Earth.
6. There's moreover the known terrestrial magnetic variation whose period is equal to 24 hours and 50 minutes, period which coincides with the time that must pass

for the Moon to assume the same position compared to the Earth, generating the known and showy tides.

7. The terrestrial magnetic variation whose period is equal to 24 hours, period that coincides with the time that must pass for the Sun to assume the same position compared to the Earth (solar tides).

8. The terrestrial magnetic variation whose period is approximately equal to 27,3 days, period that also coincides[9] with Moon's time of revolution around the Earth.

Talking about these last points it is opportune to still make some short and further clarifications. Fig. 13

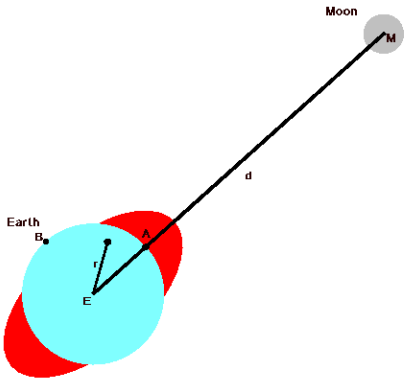

Fig. 13

shows the phenomenon of the terrestrial tides produced by the Moon (Sun). In the moment in which the Moon occupies position M, the Earth assumes the form of spin ellipsoid whose main axis coincides with the Earth-Moon direction, the ellipsoid is marked in red. There is therefore a lengthening in such direction and a contemporary

[9] Beyond that, with the period of rotation of the equatorial belt of the Sun. This would involve the Sun to act as a magnetic light whose period of revolution would coincide with the one of its equatorial rotation. Then in a lonely point of its equatorial belt, it would have to exist a zone having a concentrated and perennial magnetism.

shortening in the direction orthogonal to the previous one. In the hypothesis the Moon would be completely missing, the terrestrial geoid would evidently resume its natural spheroidal form. Therefore we can conclude saying that a mass invested by a gravitational wave is subject to the said deformations and held in particular by the famous relation

$$\varphi \simeq \frac{3}{2}\frac{G M_M r^2}{d^3}\left(\frac{1}{3}-\cos(z)\right)$$

giving tide potential[10]. M_M is Moon mass (Sun), r is the distance from the center of the Earth to the generic terrestrial mass dm in exam and Z is the zenithal distance of the Moon (Sun) (in this expression are not reported further terms of quantity $\left(r/d\right)$, because of their smallness). Then, It is completely immediate to find that, according with (0.295), the said gradient becomes now *likewise* the function of the magnetic mass of the Moon (Sun) $\mathfrak{M}_m$ (see formula (0.295)) and of the magnetic field H_m (see formula (0.320)) and it assumes its maximum values with the same intervals of time of the aforesaid tides. In fact it is had:

$$\varphi \simeq \frac{3}{2}\frac{G M_L r^2}{d^3}\left(\frac{1}{3}-\cos(z)\right)=\frac{3}{2}\frac{1}{d}\frac{H_m}{\mathfrak{M}_m}r^2\left(\frac{1}{3}-\cos(z)\right)$$

This involves that the gravitational variations that the Moon induces on the Earth are coinciding with the variations that the pre-exsistent terrestrial magnetic field endures as the effect caused by the magnetic induction that Moon produces on Earth (see § 11 ded-

[10] We can't underestimate the fact that these cyclical and perennial deformations of the terrestrial crust generate the most dangerous effort phenomenon, able to fracture any material. In effects the continuous and alternated action that the Earth is subject to, above all generates cyclical elastoplastic and hysteretic deformations in the terrestrial crust. Probability this could be a cause of tectonic nature earthquakes, phenomenon that could be screened with the use of opportune magnetograms, as seen the nature exquisitely electromagnetic of the aforesaid deformations [35]. It has to be observed the hysteresis also constitutes a kind of defense against the cyclical deformations.

icated to the relationship between the Moon and the terrestrial magnetism), as later will be better discussed.

In regards of the gravitational deformations of Fig. 13 it is observed that the lunar tides raise the sea even of 15-20 meters[11], in comparison to a temporarly immobile terrestrial crust. Kept count that the average terrestrial ray is of 6373 Km. it has that a meter of the terrestrial ray would grow on the conjuction Earth-Moon on average

$$Rapp = \frac{16}{6.355.000} = 0.0000025$$

that is of 0.00025 millimeters (the deformation is much more elevated because it regards the oceanic water mass above all). The deformation of the terrestrial crust is instead of the order of about 30 cm.. It seems obvious that these types of deformation are not noticeable with extensometers or interferometers of the type of those used in plan VIRGO for the simple reason that a laboratory containing said equipment, placed on the terrestrial surface in the point A on Earth (Fig. 13), would be raised towards the Moon with all its inner equipment. It would be had in the point B. In that case would come, with all its equipment, entirely lowered. It's not even possible to realize antennas whose length would be comparable (as it happens in electrical engineering) with that of the gravitational waves, because as seen and considered these last ones, in the event of the bodies of the solar system, have astronomical lengths.

Before passing to their possible experimental location let's say some variations of terrestrial magnetic field are reliable and they are called pulsations, they have a period that goes from approximately a second to about fifteen minutes, as it is showed in the following table[12].

[11] Fundy Bay in Northern US.

[12] Let's notice how in this table, taken from the internet, magnetic variation with a period of about 11 years is attributed to a non-well-identified solar cycle.

Variations	Type	Period	Ampleness	Cause
Regular			nT	
	Lunar diurnal	$24^h\ 50^m$	$2 \div 10$	ionospheric electric currents
	Solar diurnal	24^h	$10 \div 200$	ionical electric currents
	Cyclic solar	≈ 11 years	≈ 10	solar activity
Intermediary	pulsations	from 1^s to 15^m	$0.05 \div 500$	Interactions among particles and magnetosphere

On the force on what we already said, there's the idea that the magnetic variation indissolubly connected to the gravitational variation concurs the measure of the period of revolution of the secondary mass around that main one and therefore it allows the direct experimental *determination of the gravitational dipole frequency* from which is then possible to go back to the wavelength connected to it. In a few we will show, with some examples, how that is possible with an analysis of the magnetogram of which in the Fig. 14.

At the top of the said figure, there are the variations of terrestrial magnetic field relative to year 2008, the magnetogram was registered by the Institute of Geophysicist and Volcanology in L'Aquila (Italy), directed by the Prof. Paolo Palangio to which I'm thanking. The time in hours is reported on the x-axis, and on y-axis there are nT values of the horizontal component of the terrestrial magnetic field (to be honest it's about magnetic induction B). At the bottom of the figure, the cycle of moon phase is showed.

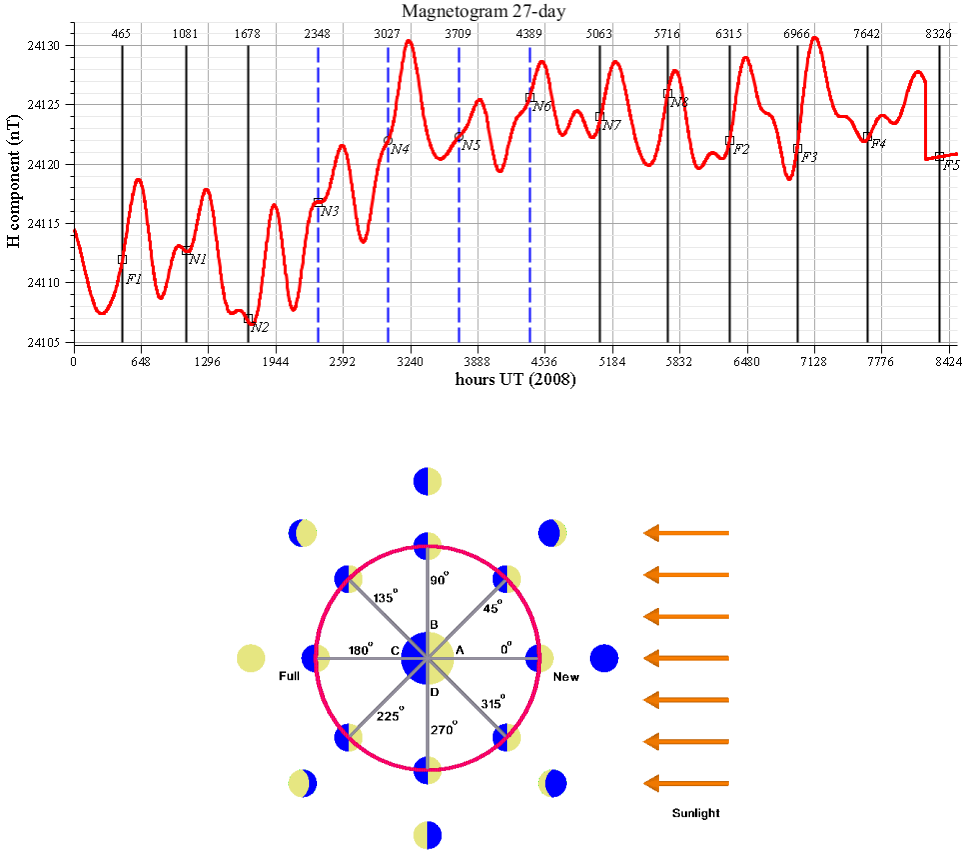

Fig. 14

This magnetogram is named “27 days” because, like it can be easly seen, the maximums of the diagram occur with a temporal cadence of 27.3 days, time equal to 648 hours and its multiples (see gray grill). These multiples are numerically represented on the x-axis. The values of the magnetic induction have been found with an interval of an hour and therefore every day, from the beginning of the considered year, 24 measurements have been executed. There’s something to say on purpose, if a relative magnetogram is taken in examination, as an example, on the year 2003 we notice it is strictly different from the one of 2008 (taken in exam now). In fact that one of 2003, in the

same interval of time, introduces many more *apparently accidental* variations. All this is caused by the simple but important reason that, as it can be easy found from Fig. 11 and 12, year 2003 falls in the middle of the solar cycle 23 and so in the said period Earth has been subject of an intense magnetic solar storm that then has been gone gradually reducing to minimum in year 2008.

On the same diagram of Fig. 14 the vertical lines we have traced in correspondence of the times in which the lunar perigees in the aforesaid year have been taken place. These times, obtained from the lunar ephemeres, are also numerically brought back in the higher part of the picture. To properly interpret and read it's opportune to make these considerations on Moon's motions and positions[13]. As it's known the greater axis of the lunar elliptic orbit (that has an eccentricity equal to $\varepsilon = 0.05449$ is not fixed in the space but it considerably rotates in the same direction of the revolution motion of the Moon (as an example seen on Mercury's motion of perihelion). So the lunar perigee, in a complete revolution of the Moon around the Earth of about 27.3 days, it has a precession motion of 3° and 3' (let's well notice that this precession, was (and is still) an unsurmountable problem for Newton[14] of the same identical nature of that relative to the perihelion of Mercury [see 30]) and therefore the major semi-axis of the lunar orbit completes a 360° angle when the Moon has completed approximately 118 revolutions around the Earth and that's after about 8.8 years. Let's still well notice that this is the most big advance (not by chance) recorded for an entire solar system for a much more simple reason that we cannot deepen in this work [30].

This continuous and marked advance involves the lunar perigee (during which the maximum tide would have to be verified) to continuously move in the space. Sometimes it verifies in proximity of new Moon and other times in proximity of full Moon,

[13] In effects the Earth-Moon system, only in first request, can be considered an isolated gravitational dipole. In the event under examination, as it will be seen, it is necessary also to consider the action of the Sun.

[14] Problem that accompanied Newton for all his life (as it's easy to notice by reading his work omnia i Principia) and that has reached us under other forms.

other times in intermediate points between these two extremes (see moon phase). These two extreme positions, characterized in the lower part of the figure from the angles 0° degrees and 180°, they are indicated with the letters N (New) and F (Full) at the top part of the figure.

In effects when the perigee verification in proximity of the new Moon, as it is showed in the moon phase represented in Fig. 14, the underlying terrestrial surface (point A) is subjected to the sum of lunar and solar tide (it is obvious that the maximum effect occurs only when a Sun eclipse (in such case Moon is in exact Earth-Sun conjunction)). Instead, when the perigee occurs in proximity of full Moon (point C) these two effects are subtracted and therefore the consequent tide is smaller (the effect evidently reaches for its minimum during Moon eclipse (in such case Earth is between the Sun and the Moon)). Then, there are intermediate cases, more complicated because the three stars Earth, Moon and Sun are not in these cases aligned. We also have to say that the terrestrial surface is subject to the centrifugal force because of Earth speed rotation around its axis imprinting a centrifugal acceleration, on the equator, approximately equal to $3.37\left[cm/\sec^2\right]$ and it let the gravitational force the Earth performs on the bodies placed on its surface to decrease, but this force, because of a given latitude, is constant and therefore it only let gravitational acceleration constantly to decrease. Therefore there are various factors to be considered.

In the diagram under examination, also the intersection points of the diagram are indicated by vertical lines that indicate the perigees[15] it's noticeable that those which occurred on 5 May (h=3027.38) and on 6 June (h=3709.15) of 2008 (indicated with two some circles) are the only ones to be closest to the new Moon. They also are characterized by an outlined vertical segment in blue color. The perigee characterized with N_4, has taken place 15 hours after the new Moon [16] while the second one, indicated with

[15] http://www.fourmilab.ch/earthview/pacalc.html
[16] The position of the Moon is characterized from the angle of 8.24°.

N_5, has taken place 6 hours before the new Moon [17]. Immediately we see the other two perigees, indicated with N_3 and N_6, and they occurred 1 day and 15 hours after the new Moon [18] and 1 day and 4 hours before the new Moon [19]. For all the others the said anticipation or postponement is much more stronger. We can therefore say that the tide effects, at the moments characterized from the circles, have been the strongest ones. Now let's observe that in the four points said before $N_3\, N_4\, N_5\, N_6$ in particular the curve of the magnetogram introduces some characteristic flection points having a positive tangent. This indicates that a variation of the magnetogram is had in conjuction with the variation of the curve described by the Moon during the perigees and this in compliance with the pointed out formulas. .

Other similar characteristics that join both the said magnetograms then the diagrams related to the solar magnetic storms (numbers of Wolf), will be later fully deepen.

All the things we already said allow us to conclude that an accurate study of the particular viariations of a magnetogram executed with an instrumentation of high sensibility allows to intercept the period of revolution of the secondary mass m ***around that main one*** M **.**

After all a magnetogram denounces the electromagnetic (or electrogravitational) actions that the several celestial bodies reciprocally practice, it also experimentally let to find the frequency of the attended gravitational wave, because both the classic electromagnetism, and the R.G. that the present thesis are agreeing, in asserting that the frequency of the gravitational radiation exactly coincides with the frequency of the electromagnetic or gravitational dipole.

We are therefore able to conclude that the terrestrial magnetic field in particular constitutes an optimal and free antenna for the relief of the gravitational waves coming from our solar system and from the abysmal depths of the cosmos surrounding us. And,

[17] To which corresponds a position angle of -3.19°.
[18] To which corresponds an angle of 21.43°.
[19] To which corresponds an angle of -15.39°.

in all probability, those so-called pulsations of the terrestrial magnetic field of the order of a few seconds (to which wavelengths correspond of at least 300.000 Km., distance nearly coinciding with the one between the Earth and the Moon) and that have not been interpreted yet, are instead caused by the gravitational waves (or electromagnetic waves) coming from the so-called Pulsar, or neutron stars that hit our planet. It can also be deduced, based on all this, the experimental determination of the speed propagation of the gravitational perturbation can be easily executed, with a particular magnetogram, the magnetic variation that characterizes the period of revolution is intercepted, as an example, one of Jupiter's moon, by applying again the method of Røemer also in this case, that the determination concurred for the first time, with astronomical methods, of the light speed. Metis (Jupiter XVI°), the closest Moon to Jupiter, has a period of revolution of $7^h\ 4^m\ 29^s = 7{,}0747^h$.

Then it seems lawful to conclude that the unsurmountable actual impossibility to build antennas able to find the gravitational wavelengths[20] (they would have, to be effective, dimensions comparable at least to the Earth-Moon distance) can be then easly put aside by releaving the frequency of these waves through the experimental measure of the period of magnetic variations they perform in particular on the terrestrial magnetic field. As we saw, the fusion between gravity and classic electromagnetism automatically involves the speed of propagation of the gravitational waves to coincide with light speed, as it is easy to show [34], than the gravitational wavelength of a dipole of this type is given from the general relation

$$\lambda_g = \frac{C}{f} = 2\,\pi\,d\,\frac{C}{v}n \quad (n = 1, 2, 3..n)$$

where C is the speed light, f is the wave frequency and v is the average speed of distance of the closed orbit covered by the secondary mass m around that main one M

[20] They should have a length at least equal to a quarter of the wavelength that has to be measured.

and n a particular integer [21] [17]. This relation, in the particular event of the hydrogen atom, becomes

$$\lambda_g = 2\pi d \frac{C}{v} n = 2\pi d\ 137\ n \quad (n = 1, 2, 3..n)$$

formula from which the two relative conditions of quantization of Bohr of the afore-said atom come down immediately [20, 21] (137 it is the inverse of the fine-structure constant). All this will lead us to legitimately speak about photo-gravitons different from the photons for the simple fact they are characterized from very low frequencies: there's no other difference.

[21] Probably this generalized quantization will avoid at the same time or the singularity that the catastrophe, this time, is gravitational (idea of nobel Abdus Salam). But it is easy to realize that these two catastrophes now become the other side of the coin.

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