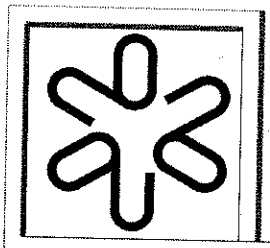

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Island effect theory of gravitation - Le Sage-Brush's theory

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Gravitation is caused by waves and particles that fill in space, and not by the named warped space (which does not exist) of Einstein's general relativity. It is our duty not to ignore the truth and testimonials mentioned in this article. This theory of island effect is the only and true theory of gravitation. All students have the right to know it. We must show it.

Key words: gravitation, warped space, Einsten's general relativity, Newtonian constant G, gravitational fields, neutrinos, cosmology, Maurice Allais effect, Foucault pendulum, gravimeters, dark matter, dark energy, red shift, Charles Brush, George Louis LeSage, kinetic theory of gravitation.

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Introduction

To quote A. P. French (*1*) (from Massachusetts Institute of Technology): *"In 1747 George Louis Le Sage explained the inverse square law of gravitation by postulating that vast numbers of invisible particles were flying through space in all directions at high speeds. Objects like the sun and planets block these particles, leading to a shadowing effect that has the same quantitative result as a gravitational attraction. A theory in which opaque objects block the particles completely is fairly easy to refute, but a theory in which the attenuation of the particles by objects is incomplete or even very small is much harder to dismiss."*

At this point we can call Le Sage's particles gravitational particles or gravitational waves. (For each particle there is an associated wave.)

Now we suggest a reading of conclusion if you want to have a whole idea of this article.

There are 5.09 millions of high energy solar neutrinos per cm^2 and per second (SIC) crossing over your body now (SNO). These neutrinos cross the Earth very easily, and each one of them carries enough energy and linear momentum to break a deuterium nucleus. There are neutrinos of other energies as well. There are much more waves and particles filling in the universe. In our galaxy there are around 200 billions of stars. It is estimated to exist around 50 and 100 billions of galaxies (NASA). Imagine this quintillion of stars producing waves and particles around us.

Charles F. Brush from Ohio (1849-1929), published articles from 1910 until 1929 about the present theory using the name *"A kinetic theory of gravitation"* at the best scientific periodics, like Nature, Science, Physical Review, etc. In 1996 T. Jaakkola has published "Action-at-a-Distance and Local Action in Gravitation: Discussion and a Possible Solution of the Dilema", with this same central idea.

At this very moment your body is being crossed and pushed in all directions by waves and particles coming from all around. The applied forces toward the right and left sides of your body are of virtually the same magnitude, so you do not perceive them. However what occurs vertically is different. Waves moving downwards have a greater magnitude than those moving upwards, rising from the ground. The rising waves have crossed through our planet, which has absorbed some of them. Hence, you are being pushed downwards with a force of greater magnitude than upwards, with a difference of 9.8 N/kg. Connecting LeSage-Brush's theory with M. Oldham *et al* results, we can conclude that our planet acts as a shield and absorbs (0.59 ± 0.75) % of the gravitational waves that cross it. This figure can not be used as reference. It is just a preliminary result that can be used as a starter. From P. Varga *et al* article calculation indicates that our Earth absorbs (81 ± 10)% or from another kind of calculation (79.8 ± 0.3)% of waves responsible by gravitation. P. Varga *et al* article is more trustful than M. Oldham *et al* article because P. Varga *et al* are calibrating gravimeters in laboratory.

This 80% absorption implies an upper limit of 12 m/s^2 for gravitational fields, but only for frequencies of Earth's matter. For stars' matter we can not set up this upper limit. For other planets the upper limit is different. It depends on matter's frequencies including atomic nuclei. Between two stars this upper limit can reach millions or more of m/s^2.

A solar eclipse argument

According to Le Sage's postulate, it is possible to say that the Sun and the Moon "attract" the Earth because they block gravitational waves (or particles) that would otherwise reach and push our planet.

During a solar eclipse, there are waves that cross the Earth after having crossed both the Sun and the Moon, in that order.

Then, before and after the eclipse the Moon blocks a larger fraction of these waves that are going to the Earth, than during it.

Thus, during the eclipse, the Earth draws a slightly wider orbit about the sun than it does before and after the eclipse, a phenomenon which can be observed experimentally by using a Foucault pendulum.

The pendulum must not be at the plane that contains the earth's center of gravity (regarding the sun's gravitational field) and is normal to the straight line that contains both the earth and the sun's centers of mass.

To quote a NASA site (2) (from Marshall Space Flight Center): *"In a marathon experiment in 1954, Allais (3) released a Foucault pendulum every 14 minutes – for 30 days and nights – without missing a data point. He recorded the direction of precession (in degrees) at his Paris laboratory. This energetic show of human endurance happened to overlap with the 1954 solar eclipse. It also covered slightly more than one orbit of the Earth by the Moon. During the eclipse, the pendulum took an unexpected turn, changing its angle of rotation by 13.5 degrees."*

"Both before and after the eclipse, the pendulum experienced normal rotation, the Foucault effect, of 0.19 degrees/minute. This 13.5-degree excursion in the angular plane persisted throughout the length of the eclipse, a total of 2.5 hours of observations from eclipse start on Earth's west limb to end on the east limb."

"Allais got similar results when he later repeated the experiment during a solar eclipse in 1959."

"In an American J. of Physics (58, 530, 1990; G. T. Gillies) review, the summary of Allais' work reads: "A physicist (who later won a Nobel prize in economics) finds a gravitational anisotropy at the level of 5 micro-G.(5×10^{-6})." "

Island Effect at the sea

According to Le Sage-Brush's theory, gravitational forces are caused by what we can call: **the island effect** (*4*). The sea's waves travel in all directions. **The island effect** can be summarized as follows: ***on any given island beach, waves are continuously arriving.*** (There are exceptions in the sea case, which do not cause problems in gravitation.) If an object floats just offshore of an island beach, it will move towards the beach as if the island were attracting it; however the waves are in fact pushing it towards the beach.

Island Effect in space

Space is filled up with waves (and particles) moving in all directions. Background radiation and neutrinos serve as examples of such omnipresent particles. Neutrinos are known to pass easily through matter (*5*). They can pass through several planets similar to the Earth when placed side by side.

The island effect occurs in space (in a three dimensional way) in the same manner as it occurs at the surface of the sea (in a two dimensional way). One big difference can be noted, however. A sea island blocks the passing of all waves that hit it, while matter, in general, only partially blocks the main waves that are responsible for gravitation.

For any body, waves that fill up space in an isotropic way are always coming from all sides, just as waves move towards the beaches of a sea island.

Figure 1 shows isotropic (or nearly isotropic) waves arriving at the surface of the Earth. They come from all around, however the resulting flux is radial and downwards.

This is **the island effect,** happening all around our Earth.

FIG. 1

Your body is being pushed downwards and upwards, to the right and to the left, forwards and backwards, but the intensity of horizontal waves from the right is almost the same as the intensity of those from the left, causing the horizontal force components to be null.

The quantitative result is 9.8 N/kg downwards, which is the gravitational field or the weight per unit mass for bodies located near the Earth's surface. (9.8 N/kg = 9.8 m/s^2)

At any point near the Moon's surface, the gravitational field is less intense than here near the Earth's surface, because there is a greater intensity of waves rising from the ground there than here since the Moon absorbs fewer gravitational waves than does the Earth.

Inertial mass, gravitational mass, and the dark matter enigma

Usually we consider:

- **Inertial mass:** a measure of a body's resistance to acceleration.
- **Gravitational mass:** a measure of how much a body "attracts" others bodies.

Thus, according to LeSage-Brush's theory, it is easy to realize that gravitational mass is a measure of how much a body absorbs from waves and particles responsible for gravitation.

For the weight we find:

$$\mathbf{F} = m\,\mathbf{g} \qquad (1)$$

where m is the body's gravitational mass and **g** is the local free-fall acceleration. Hence, according to LeSage-Brush's theory when we heat up a body, we are in fact increasing the interaction between its molecules and the waves or particles responsible for gravitation, and body's gravitational mass becomes greater (*6*). We can thus state that gravitational mass increases with the temperature. However, we can not say the same about inertial mass. Let us assume that it not varies. (There are others considerations here, for example, Sun's gravitational mass include absorption of ultra high frequencies that simply do not interact with mass in temperatures of our world, but let us simplify now.)

Possible solution for dark matter enigma

Consider a star of gravitational mass m_g and inertial mass m_i gravitating around an enormous gravitational mass M ($M >>> m_g$) at a constant distance R. Being G the Newtonian constant and v the magnitude of linear star's speed regarding a reference frame fixed in M, the centripetal force acting on the star is the gravitational one, then we can write:

$$G\,M\,m_g / R^2 = m_i\,v^2 / R \qquad (2)$$

Very high star's temperatures produce gravitational masses greater enough than inertial ones giving the illusion of what we are calling the dark matter.

For example: if $m_g = 10m_i$ and we consider $m_g = m_i$, then we can think that M are 10M.

LeSage-Brush's waves (or particles)

The question that naturally arises at this point is:

Which waves are these, after all?

We still do not know, but out of what has been shown so far, we have been able to realize that all waves and particles which fill up space, in at least an approximately isotropic way, exert their share in the gravitational force, including neutrinos and

background radiation. However gravitational waves have to cross bodies easily, then the background radiation contribution is negligible in general.

To quote Arthur McDonald *et al* (*7*) (Director of Sudbury Neutrino Observatory (SNO)): (p. 60) "*If neutrinos change their flavor by oscillation, then they have mass.* ***After photons, neutrinos are the most numerous particles in the Universe.*** *Hence, even a minuscule mass could have an important cosmological meaning. Experiments that observe neutrinos' oscillation, such as SNO and Super-Kamiokande, measure only differences of mass, and not the masses themselves. Showing that differences are not null, however, they prove that at least some masses are not null.*" (It was translated from Portuguese into English.)

(p. 59):"***Five million high energy solar neutrinos are crossing each square centimeter of your body per second.***"

According to D. Halliday, R. Resnick, and J. Walker (1993): *"Billions upon billions of neutrinos pass through our bodies every second, leaving no trace."*

If one neutrino can break a deuteron nucleus, then it has the required condition to push and heat bodies. **Neutrinos can perfectly be the main gravitational waves.**

Just for information: T. van Flandern's test (*8*) indicates that if gravitation is something which propagates itself, its propagation speed is then at least twenty times greater than the speed of propagation of light.

An accelerated expansion of the universe – dark energy

Red shift has showed that the universe expansion is accelerated (*9*).

Starting with the principle that the waves responsible for gravitation can be inside the region occupied by all the galaxies in the Universe and not outside, or even that they can be outside this region but, if so, going only from inside to outside, as they can be produced by the stars or due to another unknown cause, then we must expect an accelerated expansion of the Universe. According to this, the accelerated expansion occurs because we only have applied forces from inside this region to outside.

As you can see, according to Le Sage-Brush's theory, we can expect an Accelerating Universe.

To quote Paul P. Sipiera (*10*): "*The Sun is one of more than 200 billion stars in the Milk Way.*"

Astronomers have estimated the number of galaxies in the universe to be between 50 and 100 billion. (Hubble Deep Field Activity – NASA.)

Imagine our solar system inside this region.

Newton's action-reaction law

In order to understand that the present theory proves itself correct, the understanding of the following statement is crucial.

If we consider two billiard balls placed vertically near the Earth's surface, and if we only take into account the gravitational forces of "attraction" between them, then the magnitude of the force acting upon the ball underneath will be greater.

Consider two identical billiard balls, (they do not need to have the same mass, but let us consider them to be identical in order to make reasoning easier), which we shall call A and B. Let these be placed vertically near the Earth's surface and also let B rest below A. Figure 2 displays such situation for bodies much bigger than billiard balls.

FIG. 2

What is the mechanism that causes them to "attract" each other?

Ball A (the one above) blocks part of the descending waves that would otherwise hit B and push it downwards. The lack of such downward-pushing force upon ball B is what we call the uprising force due to the presence of A.

In the same manner, ball B (that stays below) blocks part of the rising waves (due to its presence) that would otherwise hit ball A and push it upwards. The lack of such upward-pushing forces upon ball A is what we call downward force due to the presence of B.

As we have seen before, we have a greater intensity of descending waves than ascending waves. Hence, ball A above (when we consider "attraction" forces between balls only) blocks a greater percentage of such waves than the ball below, and **the intensity of the force acting upon the ball located below is therefore greater.**

Notes:

1) If the balls were to have different masses, this statement would still be valid. (If, for example, we doubled the mass of the ball below and kept the other mass to its initial value, the two "attraction" forces would have their respective intensities doubled and the ball 'below would therefore remain under the action of a force of greater intensity);

2) We shall replace billiard balls with the following objects: **water** from the Stwlan reservoir, from the Ffestiniog hydroelectric plant, North Wales (UK) and the **sensor** of a gravimeter staying alternately above and below the water from the reservoir;

3) Because these forces possess different intensities, **such force pair is not of the action-reaction type.** To clarify, the "attraction" forces exchanged between the two balls do not constitute themselves a pair of the action-reaction kind, it suffices to remind us that such forces are not applied by the same waves;

4) There is no incompatibility whatever with Newton's law of action and reaction. We are just coming to discover that gravitational "attraction" forces do not constitute pairs of such kinds themselves. In such case of gravitational "attraction," action-reaction-type-pairs are exchanged between masses and waves that cross them, either completely or partially.

LaCoste-Romberg gravity meter (LCR) and the portion of waves absorbed by our Earth

The LCR gravimeter is a very precise apparatus for measuring gravitational variations of the order of one micro Gal (1uGal = 1×10^{-8} m/s^2). They can be still more precise, depending on the type of electronic output used and the mode of operation, as with fixed gravimeter models on the laboratory.

They can also measure the Earth's gravitational field at the above-mentioned precision, instead of just measuring small field variations.

The numerical values used on the present work are the ones from the article by M. Oldham *et al,* (*11*) in which two gravimeters were used, one above and one below the **water** from North Wales' Ffestiniog hydroelectric plant (UK), in which the water level varies up to 23 meters. The appliances remained installed on location from December 1989 to April 1990, and the evaluated data originated from eight measurement weeks, between January and March.

The LCR gravimeter contains a **sensor** (as indicated on figure 3) attached to a high sensitivity mechanism, which contains a spring and an independent system that constantly maintains it at the same (horizontal) position. It contains no magnetic components.

FIG. 3

Replacing the snooker balls (mentioned above) respectively with the water from the reservoir and the gravimeter's sensor we find:

1) When the **water mass** from the reservoir lies **above** the **gravimeter's sensor**, as in figure 4, the sensor is "pulled" upwards with greater intensity than predicted by the current theory (Newton's inverse square law and General Relativity). The experimental **result** from the eight week's measurement obtained by M. Oldham *et al* (*11*) was (0.46 ± 0.53)% **greater** than the current theory forecasts. **It corresponds to an indirect measure of wave intensity reaching the Earth's surface downwards.**

FIG. 4

2) When the **water mass** from the reservoir lies **below** the **gravimeter's sensor** (situation depicted in figure 5), this sensor (that replaces the upper ball), is "pulled" downwards by the water mass, with lesser intensity than predicted by the current theory. M. Oldham *et al* (11) obtained a **value** (0.13 ± 0.22)% **lesser** than the current theory foresees. **It corresponds to an indirect measurement of wave intensity going upwards** and consequently, the ones that have crossed the Earth.

FIG.5

Note: When Newton's Constant G is measured between vertically placed bodies, in general research uses the mean value of the following two situations: 1) Gravimeter below the source mass, 2) Gravimeter above the source mass.

3) This way it is easy to determine that our Earth absorbs (0.59 ± 0.75) % of these waves when they cross it, regarding to the M. Oldham *et al* experiment, and regarding CODATA G value $(6{,}673 \pm 0.010) \times 10^{-11}\ m^3\ kg^{-1}\ s^{-2}$).

4) From Varga *et al* (12) article we obtain (81 ± 10)% or (79.8 ± 0.3)% of absorption (Using two independent kinds of calculation. Have a look at the last appendix of my book (26)). P. Varga *et al* results are more trustful than M. Oldham *et al* article because P. Varga *et al* are calibrating gravity meters in laboratory.

Note that the wave rays that cross the Earth, the water mass, and the gravimeter's sensor are simultaneously under consideration here. For all these directions, we are only considering the vertical components. For any other experiment the absorbed percentage may be a little different.

In order to enhance the accuracy and precision of these measurements, we have to perform experiments in laboratory (12), in which a source mass gravitational field is measured with highly precise gravimeters

For the calculation above, the absorption imposed by the Earth's atmosphere can be considered the same both for waves going upwards from the ground as well as for the ones going downwards. We are located inside a spherical layer of air that is spread around the Earth, (and which is comprised of thin homogeneous layers of air). In the inside of a homogeneous spherical layer of matter, the Newtonian gravitational field caused by such layer is null (*13*).

An upper limit for a gravitational field magnitude at Earth's matter frequencies (For stars' matter frequencies we can't set up this limit)

From the above-mentioned topic it becomes easy to note that there is an upper limit to the magnitude that a gravitational field can attain. If we consider the percentage that the Earth absorbs from these waves which cause the gravitational effect, it becomes easier to calculate this limit, which we shall call g_{max} , at least as a preliminary calculation.

For M. Oldham *et al* data, the deviations associated with the results are greater than the results themselves, which makes it impossible to obtain g_{max} with its correspondent deviation. But, if we may suppose that the Earth truly absorbs something around 0.6% of the gravitational waves that cross it, we can set up the following linear proportion: 0.6% is proportional to a gravitational field value of 9.8 m/s^2 (gravitational field magnitude near the Earth's surface) as 100% (that corresponds to a total absorption of these waves) is proportional to g_{max}.

This way we would obtain something near to 1600 m/s^2 for the value of g_{max}. This has to be considered as a preliminary value. The real value can be very different from it. However, let us use this as a starter.

From P. Varga *et al* (12) article, and for the Earth's matter frequencies we obtain $g_{max} = (12 \pm 3)\ m/s^2$. For stars' matter frequencies we can not set up the upper limit. For other planets the upper limit is different. Each planet has one particular upper limit.

The Newtonian Constant G

We obtain the following values for Newton's constant from the M. Oldham *et al* (*11*) experiment.

By using the gravimeter below the water from the reservoir:

$G_{max,\ Oldham,\ Earth} = (6{,}70 \pm 0.04) \times 10^{-11}\ m^3\ kg^{-1}\ s^{-2}$ (preliminary figure)

As we have already noted, we are indirectly measuring the intensity of the waves going downwards with respect to the surface of the Earth. (The value above is obtained by adding the figure for the Newtonian constant currently accepted, of $(0.46 \pm 0.53)\%$.)

From P. Varga *et al* (12) article we obtain;

$G_{max,\ Varga,\ Earth} = (11.5 \pm 1.1) \times 10^{-11}\ m^3\ kg^{-1}\ s^{-2}$ (preliminary figure)

By using the gravimeter above the reservoir water, we obtain the following figure:

$G_{min,\ Oldham,\ Earth} = (6{,}66 \pm 0.03) \times 10^{-11}\ m^3\ kg^{-1}\ s^{-2}$ (preliminary figure)

In this case, we are indirectly measuring the intensity of the waves that have crossed the Earth and have been partially absorbed by our planet. These waves move upwards with respect to the ground.

From P. Varga *et al* (12) article we obtain;

$G_{min,\ Varga,\ Earth} = (2.1 \pm 0.9) \times 10^{-11}\ m^3\ kg^{-1}\ s^{-2}$ (preliminary figure)

Of all fundamental constants in Physics, the Newtonian constant is the one measured the most in the last 200 years, but it is also the most imprecise of them all. The most precise values we have are mutually exclusive. For further information see Gillies studies (*14*).

The Newtonian constant seems not be constant. Even for the values introduced here, we have strong evidences that these are average values of something under constant variation.

To quote J. P. Schwarz *et al* (12) (p. 2233): *"The 1997 data were processed daily, giving values of G of 6.66 x 10^{-11} to 6.71 x 10^{-11} m^3 kg^{-1} sec^{-2}."*

To quote P. Varga *et al* (12) (in the article: Laboratory calibration of Lacoste-Romberg type gravimeters by using a heavy cylindrical ring - p.752): *"Random oscillations of up to 2 μGal can be observed both at the maximum and the minimum positions. The nature of these oscillations is not clear at present..."*

If we measure Newton's constant between horizontally placed bodies near the Earth's surface we will obtain (*15*):

$$G_{h,\,Earth} = (6{,}673 \pm 0.010) \times 10^{-11}\ m^3\,kg^{-1}\,s^{-2}$$

Which is the currently accepted value.

Newton's inverse square law

If we ignore the fact that Newton's constant is not constant, our theory is in perfect agreement with Newton's inverse-square law for particles. (JUST FOR PARTICLES).

Both Le Sage and Brush have written arguments similar to the following:

The presence of mass blocks the passage of a portion of the gravitational waves that reach it. The waves are blocked the same way in all directions, and so at a distance r from the particle, the effect is distributed along a spherical surface whose area is proportional to the square of its radius. By increasing such distance, the effect (that translates in wave absence) diminishes proportionally to the square of the distance.

We are considering an isotropic Newtonian constant here.

And, if we have a non-punctual body instead of a particle, how can we calculate its gravitational field?

In this case, the Newtonian inverse-square law can be used as an approximation of reality, which means: if the body is small like a snooker ball, Newton's law will be suitable because what it absorbs of the waves responsible for gravitation is very small. But if the body is large, like our Earth or even our Sun, the Newtonian law is in a difficult position because as waves cross the so-called body, they are absorbed by it. In this case, we must perform a point-by-point integration using Newton's law while considering G value variations, as caused by wave absorption.

G variation and our preliminary data about the Earth's absorption (M. Oldham *et al* results only. We did not make this calculus for P. Varga *et al* results.) of gravitational waves imply an increment of about 9 per cent on the Sun's gravitational mass

Let us make the simplifying assumption that we have exact values below:

1) Gravitational acceleration at the Earth's surface equals $g_E = 9.8\ m/s^2$
2) Gravitational acceleration at the Sun's surface equals $g_S = 274\ m/s^2$
3) The Earth's radius: $R_E = 6.37 \times 10^6$ m
4) The Sun's radius: $R_S = 6.96 \times 10^8$ m
5) The Earth's absorption of gravitational waves equals 0.59 per cent as obtained above (item VIII)
6) $G_{max,\,Earth} = (6{,}70 \pm 0.04) \times 10^{-11}\ m^3\,kg^{-1}\,s^{-2}$ (According to our item **X**)
7) $G = (6{,}673 \pm 0.010) \times 10^{-11}\ m^3\,kg^{-1}\,s^{-2}$ (CODATA value, obtained between horizontally placed bodies near the Earth's surface.)

Then we can make:

$$(\text{Sun's absorption}) / (274) = (0.59\%) / (9.8) \qquad (3)$$

$$\text{Sun's absorption} = 16.50\ \%$$

Hence, gravitational waves reach the Sun's surface with 100 per cent of their magnitude and leave the Sun with 83.50 per cent of their original magnitude. (Average value)

We can say then that Sun's atoms are reached by gravitational waves with

$$(100\% + 83.5\%) / 2 = 91.75\% \qquad (4)$$

of their original magnitude. (Average value)

Then we can calculate the Sun's gravitational field (g_S) by using Newton's law,

$$g_S = G_S \times M_S / R_S^{\,2} \qquad (5)$$

however using

$$G_S = 0.9175 \times (6.70 / 6.67)\ G \text{ (Newtonian constant)} \qquad (6)$$

As we are multiplying G by a factor we must divide the Sun's mass by the same factor in order to keep the Sun's gravitational effect. This implies for the Sun's gravitational mass:

$$\text{New } M_S = M_S / (0.9175 \times 6.70 / 6.67) \qquad (7)$$

$$\text{New } M_S = 1.085\ M_S$$

This calculation does not include ultra high frequencies absorbed by the Sun, because this absorption does not interfere with planets' masses since they are cool bodies regarding stars' temperatures. If we were considering gravitational effects exchanged between the sun and other star these ultra high frequencies were considered, and the result would be very greater than 9 per cent.

As already seen, according to this theory, the Sun's inertial mass is lesser than its gravitational one regarding the way we measure hear on the Earth.

From this kind of calculation, the earth's mass does not suffer appreciable variation. (It can pass from 5.98 to 5.97 ($\times 10^{24}$ kg), but we do not have enough precision to state this. It would be a decrement because in this case G increases.)

At last, if Varga *et al* data are correct, and I think so, then we simply can not use Newton's law to measure the Sun's gravitational mass, because it would absorb 100% of gravitational waves at frequencies that interact with the Earth's mass.

Possible theorem waiting for its demonstration

Now we present a possible theorem. We have calculated the horizontal component of the gravitational field created by a homogeneous sphere, on its surface g_h, which is one of its parts (due to a vertical hemisphere), as the total horizontal component is null. By using Newton's inverse-square law, a computer, and increasing the precision of the result, the quotient between the gravitational field of the sphere on its surface g and g_h approaches π.

The most precise result we have obtained so far has been:

$$g / g_h = (3.14187 \pm 0.00055) \qquad (8)$$

This result is very useful to the present theory, so it would be helpful if a mathematician would become interested in the problem; if the result would turn out to be π, as our calculation indicates, he could demonstrate it.

Our proposal: $g / g_h = \pi$ (To be confirmed) (9)

Horizontal components of forces that act on bodies close to the Earth's surface

If our planet absorbs only $(0.59 \pm 0.75)\%$ of the waves responsible for gravitation as they pass through it, as indicated by our preliminary calculation, the specific horizontal forces acting on bodies on the Earth's surface will be close to the ones acting on bodies far from the Earth. From g_{max} value we can write:

$F_h \cong 1600$ N/kg (preliminary result)

From P. Varga *et al* (*12*) article something like:

$F_h \cong 7$ N/kg (preliminary result)

The relativistic effect

According to island effect theory, bodies fall because waves push them downwards. In order to make reasoning easier, let's suppose that a body is falling close to a giant star in such a way that there will only be waves going downwards and not upwards. Let's also suppose that on that star, there is no atmosphere, so that the resulting force acting upon the so-called falling body is just its own weight, and that it starts by accelerating vertically from rest with respect to the surface of the star.

As force is due to linear momentum transference from the waves to the body, as its speed increases the transference of linear momentum decreases, and finally if the body reaches the speed of propagation of the waves that push it downwards, the force becomes

null. Consequently the speed stops increasing, and it is to be noted that speed possesses a limit because force disappears and not because mass increases, the way it is believed nowadays.

We propose the following relativistic correction:

Replacing equation (10) by equation (11) below:

$$m = m_0 / [\ 1 - (v/c)^2\ ]^{1/2} \qquad (10)$$

Where m is the inertial mass (*16*) when the magnitude of speed is v, m_0 is the "rest mass" and c is the speed of light. This formula is used today.

For the example above where F accelerates the body. The body's v and the speed of the waves have the same direction, we propose using:

$$F = F_0 \times [1 - (v/c)^2\ ]^{1/2} \qquad (11)$$

Where F_0 is the magnitude of the rest force, c is the magnitude of the speed of the waves pushing the body, **that can be or not light speed**, and F is the magnitude of the force acting on the body when its speed has magnitude v.

Note that if v = c, then F = 0.

We then obtain once more the Newtonian formula from dynamics

$$\mathbf{F} = m.\mathbf{a} \qquad (12)$$

for any speed. Where "**a**" is the body acceleration (vector), and **F** is the resulting force acting on it. (**F** is a vector and F is its magnitude) And **inertial mass does not vary with speed.**

We propose equation (11) because we know that equation (10) works. The merit here belongs to Einstein or Lorentz, but we must devise a method to obtain equation (11) or its equivalent from the transference of linear momentum from waves to bodies.

Important note: this proposal is also valid for particle accelerators, for we know that the electric field propagates itself at the speed of light and also that the electric field is responsible for the force acting on particles, so that when particles reach light speed the force becomes null.

The correct concept is REST FORCE, and not rest mass as we see nowadays. There is not rest mass because inertial mass does not vary with speed.

There is ether or not?

Let's check what Einstein said on June 9th, 1952 (*17*) : "... . *Physical objects are not in space, but these objects are spatially extended. In these way the concept "**empty space**" loses its meaning.*"

This quote is just to inform that Einstein agreed with the idea that there is no empty space. Maybe light does not use the ether on its propagation. Maybe neutrinos use it, we simply do not know. Michelson-Morley results are true, and were very tested.

I believe in the ether existence.

The movement of the molecules of gases and liquids

These movements and also the molecular thermal agitation of a solid seem to be due to the waves that fill up space. In this way the kinetic theory of gases should be rethought.

A source of heat

According to our preliminary considerations less than 0.05 per cent of the solar power comes from absorption of Le Sage-Brush's waves. This can indicates as well that waves which our Sun absorbs are 2,000 times (or maybe 20,000 times) more energetic than does the Earth. See appendix B.

It is a fundamental property of waves transporting energy and linear momentum. These waves responsible for gravitation transfer linear momentum as they cross bodies by pushing them, and also transfer energy that heats up bodies.

The temperature of the Earth increases when one travels from its surface to its center (*18*). For small depths (say the first kilometers) it increases at the rate of about 40 °C (72 °F) per kilometer, and then the inside temperature of the Earth increases more slowly as shown by Stacey (*18*).

Our Earth is almost 5 billion years old, as it is believed nowadays. It has volcanoes that erupt once in a while spending lots of energy, truly lots of energy.

It is then logical to pose the following question: where does all this energy come from?

Some theories say the Earth is still cooling down (since its formation), which could explain the fact that its internal temperature is so high. These theories have no chance of being correct, if we consider the age of the Earth is approximately of five billion years.

Other theories attribute the high internal temperatures as having originated from radioactive elements, and we should truly consider such contribution but we should also remember that almost all-radioactive emissions began with the arrival of neutrinos that could be the source of energy.

We want to propose here that the waves, which are responsible for gravitation, are the main source of heat that maintains the inside of the Earth heated, and they supply energy to volcanoes to erupt once in a while. According to this, the inside of the Earth is hotter than the external side because energy has more difficulty to escape from the inside.

The Earth must be in a stationary condition (on account of its age), i. e., equal amount of absorbed and radiated energy over a given time interval.

The high temperatures of larger planets (Jupiter, Saturn, Uranus, and Neptune) can also be explained in part by the absorption of these waves. This source of heat is not considered today.

J. Magalhães (*19*) from NASA states according to data sent by the Galileo spaceship probe, which arrived at Jupiter's atmosphere in December, 1995: *"Initial results include finding that upper atmospheric densities and temperatures are significantly higher than*

expected. ***An additional source of heating beyond sunlight appears to be necessary to account for this result,*** *...".*

About Atmospheric Composition Magalhães said (at the end of page 1): *"Helium was expected to be somewhat depleted in Jupiter's atmosphere due to separation of helium droplets in the metallic interior. However, the observed amount of depletion is less than predicted suggesting additional consideration of the internal evolution of Jupiter is in order. ..."*

The quantity of energy absorbed from gravitational waves, by a given heavenly body, in a given time interval, increases with its mass (almost proportionally to its mass when waves cross easily the referred body.). So, at constant densities the quantity of absorbed energy increases with the volume of a given heavenly body, and consequently with the cube of its radius.

However, for a given temperature, the quantity of radiated energy increases proportionally to the body's surface area, and consequently proportionally to the square of its radius.

So, the larger a celestial body is (at constant densities, and in quite general terms.), the more energy it concentrates from these waves. And from other internal sources too.

From this kind of reasoning, if we do not consider external sources of heat, one would say that a large planet is hotter than a small one in account of their sizes.

In the same way, going to the other extreme point, we know that an animal big as a fly can't be hotter than its environment because its surface area is enormous regarding its volume. (Or regarding its capacity to produce heat.)

Giant dark stars

According to our later item, the larger a celestial body is (at constant densities, and in quite general terms.), the more energy it concentrates from gravitational waves, and from other internal sources too, and consequently the greater its temperature.

According to Wien's law the greater its temperature the greater the frequency of the main emitted radiation.

So, we can hope to find large celestial bodies irradiating with frequencies above light spectrum, and maybe above any frequency we can measure, then they do not emit light. **Giant dark stars**. Very probably they can be what physicists think are **black holes** today. They can be as well part of the **dark matter** missing.

Small red stars

At the other hand small stars must irradiate at low frequencies spectrum. So we can hope to find **small red stars**. Maybe it is influencing the red shifts that we know nowadays.

According to Stephen Hawking (*20*): *"if a Quasar is so far as suggested by its red shift, then they must emit more light than whole galaxies."* (It was translated from Portuguese into English.)

Maybe a Quasar is just a small red star. Maybe not. We should study it better.

Why does a star shift the direction of light passing close to it

A very probably possibility is that light and consequently wave fronts propagate more slowly at spatial points closer to stars than for remote points (due to the presence of their atmospheres or because other causes too.), causing the shift. This is similar to what happens in refraction.

A kinetic theory of gravitation

Charles F. Brush from Ohio (1849-1929), published articles from 1910 until 1929 about the present theory using the name *"A kinetic theory of gravitation"* at the best scientific periodics, like Nature, Science, Physical Review, etc.

To quote C. F. Brush (*21*): *"The author's original (1910) theory is briefly reviewed, viz., that gravitation is due to the intrinsic energy of the ether, which is assumed to exist in wave form or energy flux of some kind propagated with high velocity in all conceivable directions so that the ethereal energy is isotropic, and is uniformly distributed everywhere except as modified by the presence of matter. The interblending energy shadows between gravitating bodies constitute a region of less than normal energy density into which the bodies are pushed by the superior energy beyond them. It is again insisted that the energy acquired by a falling body is derived from the ether."*

In 1996 T. Jaakkola (*22*) has published "Action-at-a-Distance and Local Action in Gravitation: Discussion and a Possible Solution of the Dilema", with this same central idea.

A gravitational redshift probe argument

In 1976 Marshall Space Flight Center (NASA) launched the Gravitational Redshift Probe. The purpose of the 125-pound satellite was to test the principle of equivalence in Einstein's general theory of relativity. According to theory, but never demonstrated, a clock will appear to run faster in a weaker gravitational field, at a greater distance from Earth. A very stable atomic clock was launched through Earth's gravitational field to a peak altitude of 6,200 miles (9,980 km), and its reading during the free flight was compared with that of an identical reference clock on the ground. The experiment confirmed the theory.

According to Le Sage-Brush's theory the clock ran faster because far from Earth it was hit by a greater intensity of waves and particles such as those which fill up space, and are responsible for its functioning. Our planet acts like a shield.

As we can see the experiment confirmed Le Sage-Brush's theory too.

A lot of experiments that confirm general relativity are as well confirming Le Sage-Brush's theory.

This result includes atomic clocks in satellites as on GPS system.

The electromagnetism and the meson's extra life

On cyclotrons or synchrotrons as in Campinas, UNICAMP, Brazil, eletrons travel virtually at light speed during minutes forming a bean.

Practically there are no relative movement among them, hence according to our electromagnetism they would repel each and every, and this not occurs. Two free electrons at rest in relation to the laboratory, distant 1 cm, would repel each other having instantaneous accelerations of $2{,}5 \times 10^6$ m/s^2. Then they would not be together.

We can then conclude that they attract each and every like two linear parallel electric currents in the same direction.

Note that, if we reduce their speed enough the bean explodes like a meson.

In this way ELECTROMAGNETISM INCLUDING MAXWELL EQUATIONS MUST BE REFORMULATED. Because, according electromagnetism taught nowadays (October, 2005) the magnetic field created by an electron at the position where we have other electron depends on their relative speed, and we can see that it is not true.

In my opinion, a meson is just a set of electrons that travel together, and when we reduce their speed enough in relation to the laboratory it disintegrates because electrostatic repulsion win electromagnetic attraction.

There is no relative time as explains the relativity theory.

To the reformulating of electromagnetism we need to know what movement is relevant and we simply do not know it. But is evident that there are invisible things at space that we do not consider nowadays.

To begin, we can fix a reference frame at the center of the Earth. In some cases it will accomplish the Earth's rotation, as for example in this case, and in other cases not, as for example the next.

The speed of propagation of the Earth's magnetic field

According to our last chapter, one point at the surface of a rotating and electrically charged sphere must feel its own magnetic field. Note that this affirmation is against our electromagnetism because there is no relative movement between the referred point and the electric charge.

Nearby 1998, I was imagining an experiment to confirm this last affirmation and in a comment, a friend of mine, a respected professor of IFUSP said me that it was made and was confirmed.

Hence, we can expect that the Earth's magnetic field (or magnetic induction) which we can perceive using a compass at the Earth's surface is due to the negative electric charge

of the planet's surface, and not by something positioned at the Earth's center as physicists believe today.

Today, the Earth is a sphere that contains negative electric charge on its surface. The electric field created near its surface is about 100 V/m.

As we have an inclination of about 11°, between the magnetic induction and the axis of the Earth's rotation at equator, we can calculate the speed of propagation of the Earth's magnetic field as it follows.

Be $\mathbf{V}_B$ the velocity of propagation of the Earth's magnetic induction, parallel the rotation's axis, whose magnitude we want to calculate, and $\mathbf{V}_P$ the velocity of a point of the Earth's surface at equator, due to its rotation, in relation to a reference frame fixed at the Earth's center, and that does not rotate. **V** is a vector and V is its magnitude. Be $\mathbf{V}_{B,P}$ the velocity of propagation of the magnetic induction in relation to P, that has inclination of 11° in relation to the Earth's axis of rotation, and that we perceive using a compass. Note that $\mathbf{V}_B$, $\mathbf{V}_P$, and $\mathbf{V}_{B,P}$ are tree vectors forming a right triangle as shown:

FIG. 6

Then we can write:

$$\text{tg}\,\theta = V_P / V_B$$

As V_P = 40,080 km / 23.9333 h = 1.675 km / h = 0.465 km / s, and $\theta = 11°$ (let us consider $\theta = (11° \pm 1°)$), then tg θ = 0.194, and we have:

$$V_B = (2.40 \pm 0.25)\ \text{km / s}$$

That, according to our argumentation, is the speed of propagation of the Earth's magnetic induction near its surface.

The Crémieu experiment

Victor Crémieu (*23*) had showed in 1905 that two olive drops inside a solution of water and alcohol, with the same olive oil's density, attract each other.

This experiment is easily reproducible and can not be explained by Einstein's relativity theory. It alone shows that there is not warped space as the cause of gravitation.

The island effect theory explains this easily. The waves and particles which more interact with one drop are precisely the ones that more interact with the other.

According to this, two drops of that solution inside olive oil must attract each other as well.

Yet, according to this argumentation, if two bodies block waves and particles completely different amongst themselves, then they do not attract each other, because those waves blocked by one do not interact with the other.

In this case the gravitational field created by one do not affect the other.

According this kind of reasoning we can say that the gravitational field created by the Sun affects more other star than does the Earth.

There are other considerations involving this experiment of Crémieu as for example: the weight of the olive oil drops inside the solution can vary with the deep, but let us simplify now.

Critic radius for "attraction" or "repulsion" between stars

If waves responsible for gravitation are produced by stars, and every thing indicates that they are, then must exist a radius, from the center of the universe delimitating a region out of which two stars repel each other, and in of which two stars attract each other.

This explains the accelerated expansion of the universe.

Maybe this radius is dependent of the two stars considerable.

We can calculate it firstly for two stars like our Sun positioned side by side. As attraction and repulsion depends on the square of the distance between them , then the distance must disappear of the calculation.

We must remember that high energy solar neutrinos practically do not interact with matter hear on Earth due to the enormous difference of frequencies between them, but with the stellar matter they must interact totally. In this way two equals stars positioned side by side push each other. They "attract" each other as well.

The concentration of gravitational waves and particles must increase when we travel to the center of the universe.

We must remember that there are around 200 billion stars at Milk Way. And that according to NASA (Hubble space telescope deep field, url: http://www.stsci.edu/pubinfo/amazing-space.html), astronomers have estimated the number of galaxies to be between 50 and 100 billion.

P.S.:

According to Jason Leen (mediumistic information) the ethers are nonphysical regions of the universe which are commonly perceived to be empty space. Vibrating at a

much higher frequency than physical matter, those areas are actually very much alive – filled with information and nourishment for all life forms. The ethers serve as a conveyance medium for universal energy.

Conclusion

Once we are proposing conceptual changes in Physics, other changes should also be expected. Today (March 21st, 2004) we can find more than three hundred thousand articles about Le Sage-Brush's theory at the Internet under the name: *pushing gravity*.

We want to state that any part of this theory can be modified with the evolution of our knowledge.

Note:

The idea of **the island effect** as the origin of gravitation came fully to my mind suddenly on the 23rd of July, Sunday, 1995 at about 11:30 A.M. (Brasilia time - Brazil) as if all my knowledge converged towards it. At that moment I was at home thinking about the photoelectric effect.

Each one of the below mentioned (1 to 7), disprove Einsteins's general relativity and confirm the island effect in gravitation, which is also LeSage's theory (1724-1803) as well as Brush's (1849-1929), called *a kinetic theory of gravitation*. Brush was reincarnation of LeSage.

1. Newton's constant G, between bodies arranged vertically, assumes different values than between bodies arranged in a horizontal position. Horizontal position, between for example two billiard balls, means that the straight line that contains their centres is horizontal.
2. Cremieu's experiment[23], that is: two drops of olive oil immersed in a solution of water and alcohol with the same olive oil's density attract each other.
3. During a solar eclipse, when the Moon places between the Sun and the Earth, a Foucault pendulum has an abnormal behavior. Maurice Allais – Nobel laureates – Economy in 1988, author of the experiment in 1954, confirmed in 1959 as well as lots of laboratories, including Harvard, coordinated by NASA from Alabama (msfc) in August 1999, had written that the Theory of Gravitation should be reformulated. According to the Island Effect, this happens because while the Moon places between the Earth and the Sun the orbit of the Earth changes.
4. The accelerated expansion of the Universe
5. The illusion of the dark matter

6. The deflection that light experiences in passing next to a star, in terms of quantity is not the same as the theoretical value estimated by the general relativity.

7. The Island Effect still explains the high temperature of solar crown, which is considered a mystery nowadays, from the atmosphere of Jupiter and the lack of helium detected by the probe of the spaceship Galileu, that was on Jupiter in 1995. (http://ccf.arc.nasa.gov/galileo_probe/htmls/jupiter_references.htm) it is also NASA's conclusion that there must be another source of heat.

8. The island effect has still detected a fatal error of electromagnetism. It should be reformulated, including the Maxwell's equations, then we can understand very easily what is a meson and its extra life to arrive at the surface of the Earth.

9. According to the present theory, the photoelectric effect is just a resonance case. Besides that, it does not happens to frequencies above a certain value. It is important to know that our atom corresponds to seven frequencies and this is one of the mysteries we have to study.

10. It is common to see in text books, about the restrict relativity, as well as in classrooms, an explanation that a beam of light which moves vertically inside a high speed train passing through the station and regarding the station the ray moves diagonally. From this point, it is deduced the relativistic correction formula for the time. The named "expansion of time", that is: the clock of the station moves ahead related to the one inside the train. I must say that if we make the beam of light moving vertically in the station, then it will move diagonally to the observer of the train. And in this case, conclusion commutates, that is: the clock which moved ahead will be late and vice versa, WHAT TURNS TOTALLY INVALID THIS ARGUMENT USED AS BASE FOR THE RESTRICT RELATIVITY.

11. I must add that Albert Einstein is a brilliant physicist. I say "he is" because nobody dies. I know that nowadays (today is 07th July 2005, Monday, 12:10pm) he has helped the medical team leaded by Bezerra de Menezes, who had been the apostle Lucas. I have a feeling that he has contributed to the insight I had in October 29th 2004, Friday, around 5:00 or 6:00 p.m., while I was giving class to the 3rd year in Santos, when I realized the illusion of the dark matter of the Universe. I also work in the night, while my body sleeps, with the medical team, leaded by Bezerra de Menezes. I am sure he has helped me in other occasions. Visit: www.divinismo.org

    Science without God is blind

12. When we consider a free fall from rest in relation to the laboratory at terrestrial equator, the movement in relation to the laboratory will be curve, because the horizontal linear speed regarding the Earth's rotation diminishes for points closer to the center of the Earth, and the body will keep yours. Analogous argumentation is valid for vertical or oblique throws upward. This is the Coriolis acceleration. This item is just to remember.

    Carlos José Borge – October 06th 2005,12:10pm

APPENDIX A

The origin of the gravitational force

The sidereal space is just like the surface of the sea water, filled with ripples spreading in all directions.

Let's not stick to the fact that in one occasion we are dealing with waves in three dimensions and in other with waves in two dimensions.

Imagine an island in the sea, surrounded all around by beaches. So, in any beach you may be, you will see sea waves constantly coming to you; this happens because the island itself blocks the waves which travel the other way, just for the fact of being there.

Let's make an analogy in order to facilitate the understanding: The planet Earth, for instance, or any other body, is in relation to the space, as the island is in relation to the sea. However, a relevant difference must be mentioned: it is the fact that the island blocks completely the passage of the waves which reach it, while the bodies in general are partially traversed by the waves that fill the space, which we are talking about.

Therefore, in any place of the surface of the planet you are, these waves will always be coming to you, even inside your house or apartment, with several floors above you.

However, the part coming from the ground, which traversed the Earth, is reduced, exactly for the fact of having come through the Earth. So, the resulting flow is always in the downward direction.

And now the determinant factor in the gravity force is that those waves interact with the elementary particles that constitute the atoms and so they are thrust in the direction of the acceleration of gravity (vertically downwards). In each particle the intensity of the applied force is very small, but when we make the addition for all the particles, we find, as the result, the weight of the body.

We have the impression that the body is being attracted by the Earth, but in truth it is being thrust by these waves. The same way a body that floats in the sea, near the island will be brought to the beach. One may have the impression that it is being attracted by the island.

See that, to any other two bodies, this argument justifies the apparent attraction to each other.

It's curios to observe that the more you think about this effect the clearer are your ideas.

Carlos José Borge

Appendix A is the PUBLICAÇÃO IF 1350/99, and the Physical Review D unpublished article SH5601D from August 1995.

APPENDIX 80%

ABSORÇÃO CALCULADA IMPOSTA PELA TERRA (79,8 ± 0,3)% EM CONFORMIDADE COM MEDIDA (81 ± 10)%

Quando calculamos o campo gravitacional da Terra, num ponto de sua superfície, usando a lei de Newton do inverso do quadrado, costumamos imaginar toda a massa da Terra concentrada em seu centro, e então fazemos a conta usando para a constante G o valor recomendado.

Imaginar a massa no centro da esfera, só poderia ser usado se realmente a constante G tivesse o mesmo valor para todos os pontos do interior da Terra, mas isso não acontece, porque conforme as ondas vão atravessando a matéria, elas vão sendo absorvidas e isso funciona como se G fosse diminuindo.

A parte horizontal do campo gravitacional da Terra (estamos considerando a Terra como uma esfera homogênea), em sua superfície, é nula, porque em qualquer direção horizontal temos a mesma intensidade nos dois sentidos, mas se considerarmos apenas um dos sentidos, obteremos um valor não nulo que chamaremos de

$$g_H.$$

Sendo g a intensidade do campo gravitacional na superfície de uma esfera homogênea e g_H a sua componente horizontal, como definida acima, e usando a lei de Newton do inverso do quadrado, fizemos a conta e obtivemos:

$$g / g_{H} = (3{,}14187 \pm 0{,}00055) \qquad (1)$$

O teorema que estamos propondo diz que

$$g / g_{H} = \pi \quad \text{(A PARTIR DA LEI DE NEWTON)} \qquad (2)$$

e neste apêndice vamos usar a equação 2 como verdadeira. Se depois ficar provado que o quociente acima não vale π, substituiremos π por 3,14 (apenas menos preciso).

De acordo com o princípio da independência na propagação ondulatória (quando ondas se cruzam, cada uma delas continua em sua propagação original), podemos tratar g e g_{H} como independentes.

A tabela 2 do artigo de Varga et al [7] com 449 leituras de mínimo e 437 leituras de máximo, para o campo gravitacional do anel de aço, mostra que a diferença entre o máximo e o mínimo é de 112 μGal, com um desvio da ordem de 0,4 μGal. Este resultado, unido ao nosso modo de calcular g_{H} (texto do livro), mostra que, para a Terra, o valor medido para o quociente entre g e g_{H} vale:

$$g / g_{H} = (2{,}000 \pm 0{,}007) \quad \text{(MEDIDO)} \qquad (3)$$

A diferença entre os valores teórico (π) e medido acontece porque conforme as ondas responsáveis pela gravitação, vão atravessando a Terra, elas vão sendo absorvidas.

Para simular teoricamente essa absorção vamos considerar a situação hipotética descrita abaixo.

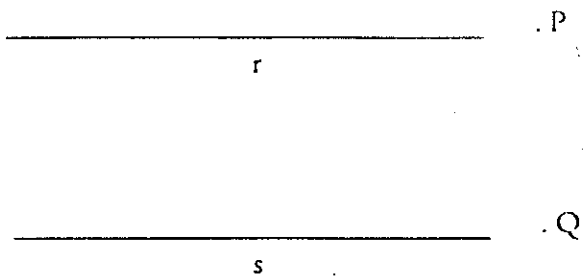
Sejam duas partículas A e B de massas πm e m respectivamente, então, de acordo com a lei de Newton do inverso do

quadrado, teremos à mesma distância d de ambas, campos gravitacionais gerados por elas tais que:

$$g_A / g_B = \pi \qquad (\pi = 3,14...) \qquad (4)$$

Vamos supor que as referidas partículas sejam compostas de subpartículas iguais entre si. Então se a partícula B contiver n subpartículas, a partícula A conterá nπ.

Vamos considerar agora os segmentos de reta r e s, paralelos e os pontos P e Q, como mostra a figura abaixo.



Vamos supor ainda que só existam ondas, dessas responsáveis pela gravitação, que viagem sobre as retas que contêm os segmentos r e s. E também, que os campos gravitacionais em P e Q sejam nulos, pois ainda não há matéria nem a esquerda e nem a direita, tanto de P como de Q, absorvendo essas ondas. E então, tanto em P quanto em Q, a intensidade dessas ondas para a direita é igual a intensidade para a esquerda.

Agora vamos considerar as nπ subpartículas da partí-

cula A distribuídas, lado a lado, sobre o segmento r e as n subpartículas de B distribuídas sobre s.

As presenças das referidas subpartículas em r e s provocarão campos gravitacionais em P e Q.

Considerando-se agora que antes de qualquer absorção, as ondas gravitacionais que viagem sobre r ou sobre s, tanto para a direita quanto para a esquerda tenham intensidades iguais à unidade (1), e que cada subpartícula, ao ser atravessada por tais ondas, absorva uma parte delas, deixando passar sempre a mesma fração x do total que a atingiu, então poderemos dizer que ao atravessarem uma dessas subpartículas a intensidade das ondas será x. Após atravessarem exatamente duas subpartículas alinhadas, a intensidade das ondas será x^2 e assim por diante.

Dessa forma, os campos gravitacionais gerados pelas $n\pi$ subpartículas presentes no segmento de reta r, em P e pelas n subpartículas de s, em Q, serão proporcionais, respectivamente a:

$$1 - x^{n\pi}$$

e

$$1 - x^{n}$$

de modo a podermos escrever:

$$g_P / g_Q = (1 - x^{n\pi}) / (1 - x^n) \qquad (5)$$

Repare também que $x^{n\pi}$ é a fração das ondas que atravessou as $n\pi$ subpartículas contidas no segmento de reta r, e que

$$1 - x^{n\pi} \quad \text{(FRAÇÃO ABSORVIDA)} \qquad (6)$$

é a fração das ondas que foi absorvida por tais subpartículas.

Repare que, de acordo com este modelo, se tivermos apenas uma subpartícula em r ou em s, ela produzirá o mesmo efeito gravitacional em P ou Q respectivamente, não importando a distância existente entre ela e o ponto P ou Q.

Desse modo, para n grande o suficiente, podemos usar a equação 5, numa primeira aproximação, para relacionar a intensidade do campo gravitacional na superfície da Terra g, com a componente g_H já definida, e assim:

$$g / g_H = (1 - x^{n\pi}) / (1 - x^n) \qquad (7)$$

onde a fração absorvida (6) é, numa primeira aproximação, a parte das ondas responsáveis pela gravitação que a Terra absorve para gerar um campo gravitacional de 9,8 m/s² em sua superfície.

Das equações 3 e 7 vem:

$$(1 - x^{n\pi}) / (1 - x^n) = (2{,}000 \pm 0{,}007) \qquad (8)$$

Tanto para n = 100 quanto para n = 10.000, a precisão da fração absorvida (6) obtida com a solução da equação 8, foi a mesma. Obtivemos:

$$(1 - x^{n\pi}) = (0{,}798 \pm 0{,}003) \qquad (9)$$

significando que a Terra absorve, numa primeira aproximação, e em relação ao aparato de Varga et al,

$$(79{,}8 \pm 0{,}3)\% \quad \text{(CALCULADO)} \qquad (10)$$

das ondas que a atravessam. Este valor é a média ponderada das projeções na vertical, das absorções de todas as direções consideradas.

Da figura 6 do artigo de Varga et al [7] obtivemos (texto) o valor medido absorvido pela Terra:

$$(81 \pm 10)\% \qquad (11)$$

A coincidência entre os valores (10) e (11) é uma prova muito forte da presente teoria e explica porque o valor medido (3) é diferente do teórico (2).

Perceber que se a Terra absorvesse pouco das ondas gravitacionais, como por exemplo 0,07% que corresponderia a

$$(1 - x^{n\pi}) = 0{,}0007 \qquad (12)$$

teríamos, para n = 100:

$$g / g_{ll} = (1 - x^{n\pi}) / (1 - x^{n}) = 3{,}14 \qquad (13)$$

como prevê a lei de Newton do inverso do quadrado da distância.

Daí concluímos que a lei de Newton pode ser usada com excelente precisão para corpos pequenos, que absorvam pouco das ondas gravitacionais, como por exemplo o anel de aço do aparato de Varga et al, mas não para um corpo do tamanho da Terra.

APPENDIX B

According to our preliminary considerations less than 0.05 per cent of the solar power comes from the absorption of Le Sage-Brush's waves

Without receiving sun's radiation in which temperature the Earth's surface would to stabilize?

This question is more complex than it seems, however let us assume that the rate of energy absorbed by the Earth from gravitational waves is balanced by the rate radiated outward.

Assuming yet that it is a perfect radiator ($\varepsilon = 1$) and that its surface temperature would stabilize below 210 K, by using the Stefan-Boltzmann law (for 210 K) we would have:

$$I = \varepsilon \sigma T^4 \qquad \text{(Ab1)}$$

Where I is the power (in watts) radiated from 1-m^2 area, σ is the Stefan-Boltzmann constant, and T the temperature at the Kelvin scale.

$$I = 1 \times 5.67 \times 10^{-8} \times 210^4$$

$$I = 110 \text{ W} / m^2$$

For it's all surface area, the power of the Earth would be:

$$P'_E = I \times 4\pi R^2 \qquad \text{(Ab2)}$$

$$P'_E = 5.6 \times 10^{16} \text{ W}$$

Supposing that the absorbed rate is proportional to the heavenly body's mass (*24*) we can estimate the equivalent solar power (P'$_S$),

$$P'_S = P'_E \times (\text{Sun's mass}) / (\text{Earth's mass}) \qquad \text{(Ab2)}$$

$$P'_S = 1.9 \times 10^{22} \text{ W}$$

Which corresponds to 0.005 per cent of the solar power ($P_S = 3.9 \times 10^{26}$ W).

We have used (Sun's mass) / (Earth's mass) = 333,000. These are gravitational masses and the very high frequencies absorbed by the Sun in account of its high temperatures were not considered. If we consider previously Sun's gravitational mass ten times greater than we usually use due to the previous considerations about dark matter (*25*), our result changes from 0.005% to about 0.05%.

Conclusion: Less than 0.05% of the solar power comes from the absorption of gravitational waves at the Earth's matter frequencies, including nucleus frequencies.

If the Earth and the Sun would have the same internal source of heat (including gravitational waves absorption) and no external sources (as sunlight for the Earth), by using the solar power (3.9×10^{26} W), analogous calculation allows us to conclude that the Earth's surface temperature would be about 2500 K. (It is curious to observe that (within our precision) this figure is numerically equals the square root of the Earth's radius.)

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Figure captions

Fig. 1. Diagram of waves arriving on the Earth's surface all the time. Spatial Island effect.

Fig. 2. Two identical bodies A and B are placed vertically with respect to the Earth's surface straight below. Considering only the gravitational "attraction" forces between them, experiments have shown that the magnitude of the force acting upon the body underneath is greater. This is one of the endorsements of Le Sage-Brush's theory.

Fig. 3. Representation (not to scale) of external side of a LaCoste Romberg gravimeter, and its sensor.

Fig. 4. Representation of a source mass A (gravitational field's source), above gravimeter's sensor B.

Fig. 5. Representation of a source mass A (gravitational field's source), below gravimeter's sensor B.

Fig. 6. Representation of $\mathbf{V}_B$, $\mathbf{V}_P$, and $\mathbf{V}_{B,P}$.

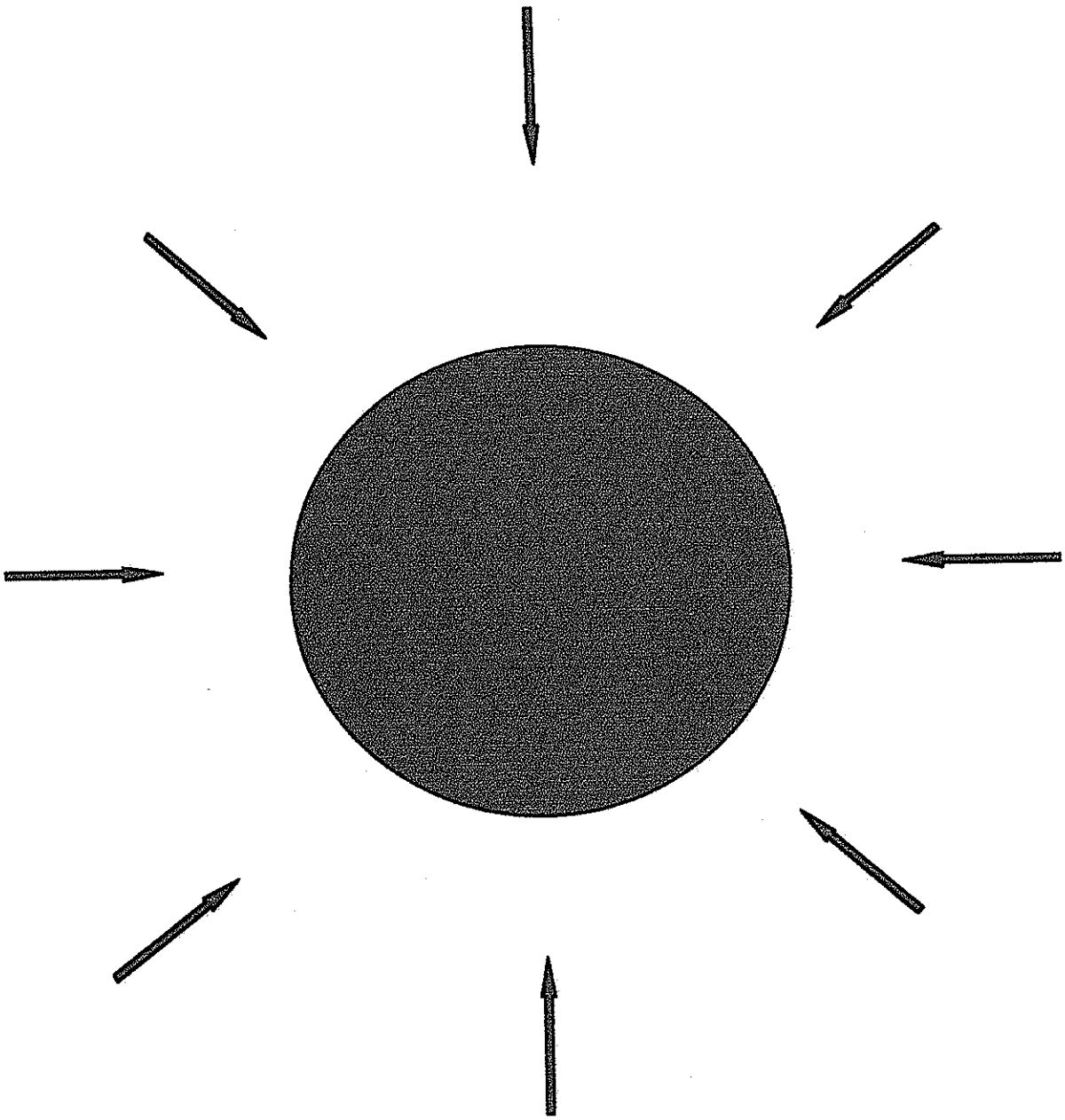

FIG. 1

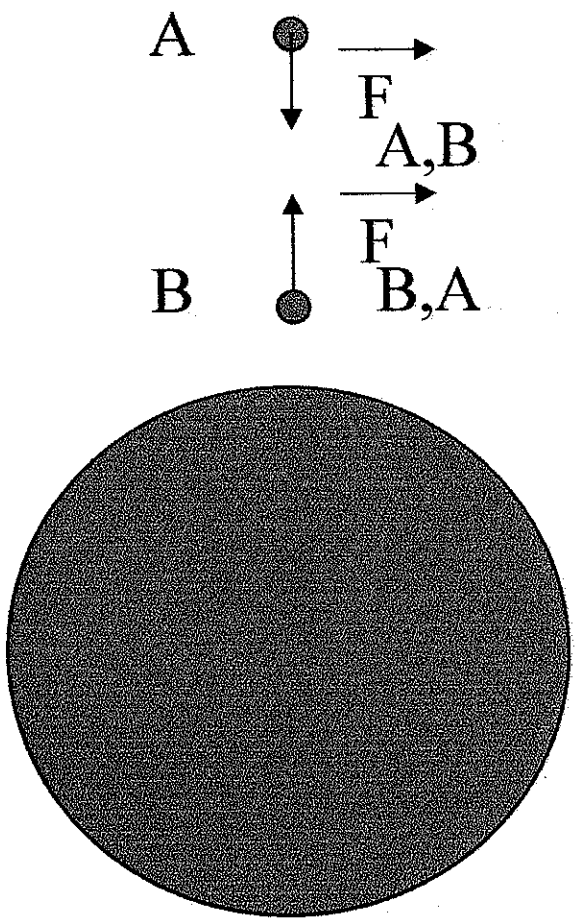

FIG. 2

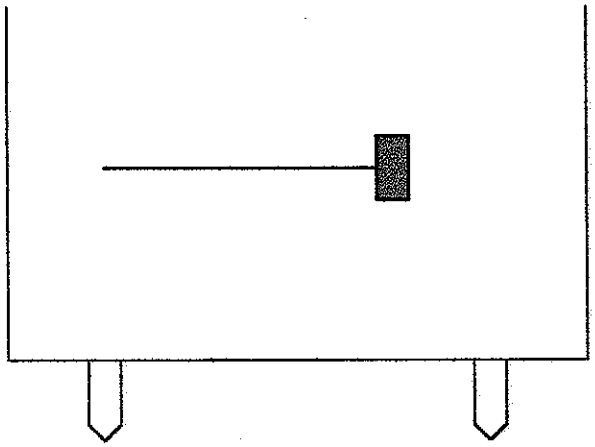

FIG. 3

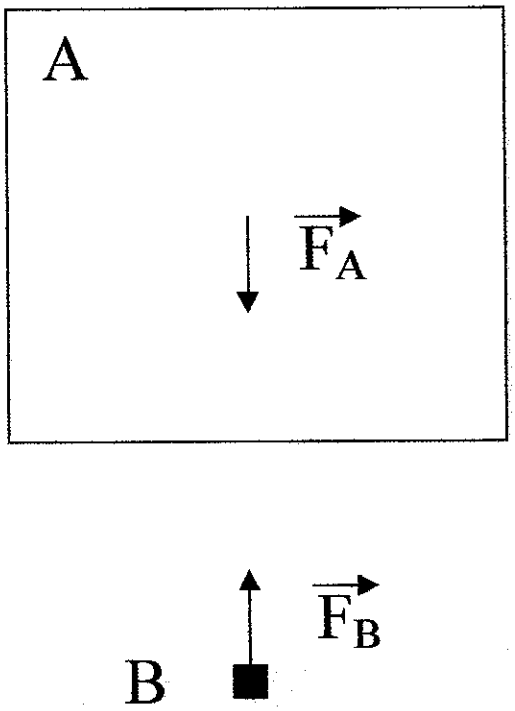

FIG. 4

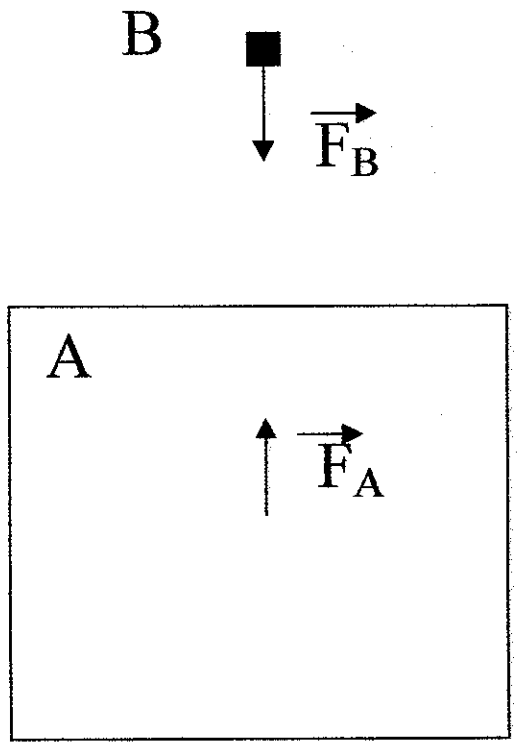

FIG. 5

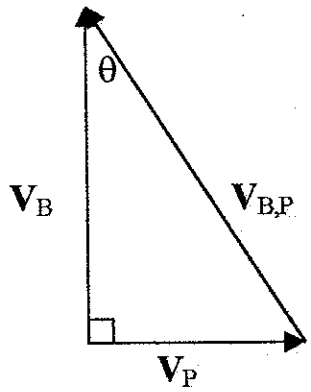

FIG. 6