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On Creating Of Body Gravitational Attraction Jet Model

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Abstract:

Gravity (gravitation, gravitational attraction) of bodies plays an important role in modern mechanics and physics in general, as well as in various application areas of science and technology. These forces are defined on the basis of attraction law by I. Newton. However the physical nature of attraction force carrier in this law remains open. To bypass these difficulties A. Einstein suggested to consider gravitation a curvature of space-time fabric. Other explanations are bound to possible influence of gravitons. However their sources remain unclear.

In article it is shown that physical nature of bodies gravity formation and transfer can be discovered on the basis of formation concept and jet emission of graviton streams due to special type of body mass processing and their subsequent influence on counter bodies which is the basis for creating presented gravitational body attraction jet model.

The spherical form body is defined by the mass of m_1 simple body mass which is falling into its simple surface. Gravitational compression unit mass force of , bound to gravitational acceleration operating on a simple surface is established. Communication of gravitational compression force with gravitons emission from unit mass force due to its processing is defined. The received functional connection is similar to functional connection which is used when constructing jets. From here the name of "jet" emission of graviton streams follows.

Connection of graviton emission force to unit mass is established with quantity of gravitons crossing a simple surface for a unit of time (conditionally a stream of gravitons), and also with velocity of graviton emission from body mass and the body mass spent for emission of one graviton.

At model operation of bodies gravitational attraction two bodies with mass of m_1 and m_2 located apart R are considered (R – distance between their barycentres) and influence of graviton streams of a body of m_1 on m_2 body and vice versa is established. Thus two factors established necessary to consider : factor of streams dispelling in process of body receding and influence of body sphericity. Graviton dispelling depends on relation of body square radius to distance square between bodies. Force with which body graviton streams of m_1 affects m_2 body attraction and vice versa is defined with the specified factors. Final transformations lead to double-valued law. At a plus-sign we come to the law of gravitation by I. Newton that confirms jet model possibility.
Graviton emission from mass can alternate with entry into it (downloading) a new portion of gravitons which can surround mass, for the subsequent emission.

Keywords: gravitational attraction jet model, unit mass, unit mass graviton jet emission, graviton emission force, dispelling effect, ejectable gravitons impact force applied to counter bodies, attraction force.

1. INTRODUCTION

Forces of gravitational attraction of bodies play an important role in modern mechanics and physics in general [1-3, etc.], in technical mechanics [4, etc.], and in various areas of technology as well, for example, in nuclear power facilities construction [5, etc.]. Gravitational forces are defined on the basis of attraction law by I. Newton [6] and his mass of bodies ideas development [7, 8]. The least clear in this law is the Newtonian idea of formation and long-range action of gravitational attraction. To bypass these difficulties A. Einstein suggested considering gravitational effects created by mass as geometry (curvature) change of space surrounding mass [9]. Other explanations are bound to possible influence of gravitons. However their source remains unclear. Synthesis of these works, as well as their critical analysis, are carried out in [10, 11]. In work [12] the solution for question of formation and transfer of gravitational forces on the basis of jet formation concept, emission and action of graviton streams from mass is offered. Let's consider such jet model creation of constitutive equations in more detail.

2. GRAVITON EMISSION FROM MASS

For descriptive reasons we will consider a body of spherical form with barycentre in the center of sphere (r_1 – the radius of sphere, m_1 – the mass of sphere). Considered object creates, for example, gravitational acceleration accordingly [10], to surfaces

$$a = \frac{\gamma m_1}{r_1^2} , \qquad (1)$$

where γ – gravitational constant.

We believe that acceleration *a* is logical to fall into to unit of sphere surface and to define in as follows

$$a = \frac{\gamma^* m_1}{4\pi r_1^2}, \qquad (2)$$

where $\gamma^* = 4\pi\gamma$.

Size ($m_1 / 4\pi r_1^2$) is at the same time simple share of sphere mass, falling into unit of its surface (mass limited to movement of sphere radius round perimeter of simple surface). Acceleration (2) causes gravitational compression of unit mass which also concerns simple surface,

$$f_1 = \frac{\gamma^* m_1^2}{16\pi^2 r_1^4} \text{ or } \qquad f_1 = \frac{\gamma m_1^2}{4\pi r_1^4}. \qquad (3)$$

We believe that specified compression is followed by jet emission of graviton stream with velocity of V. For developing and emission (it is possible only emission) graviton stream for simple surface of a sphere there is a processing of unit mass Δm_1 part which we will find from expression

$$f_1 = \frac{\gamma^* m_1^2}{16\pi^2 r_1^4} = \frac{\Delta m_1}{\Delta t} V = \frac{\Delta\eta_1 m_{01}}{\Delta t} V = \overline{\eta}_1 m_{01} V, \qquad (4)$$

where $\Delta\eta_1$ – quantity of gravitons formed during $\Delta\eta_1$ and leaving from unit area of sphere surface, m_{01} – processing of mass on emission of one graviton,

$\overline{\eta}_1$ – graviton quantity crossing a simple surface for unit of time

$$\overline{\eta}_1 = \frac{\Delta\eta_1}{\Delta t}. \qquad (5)$$

Equality (4) remains correct if sizes $\frac{\Delta m_1}{\Delta t}$, $\overline{\eta}_1$, V, m_{01} remain constants all the time.

Expression like equality of the first and third terms (4) is used when constructioning jets, the name – jet nature of interaction comes from here.

3. DEFINITION EXAMPLE OF SIMPLE MASS PROCESSING

Let's stop on definition of a particular value Δm_1 which leads to interesting result. Pass time gravitons of radius of r_1 makes

$$\Delta t = \Delta \bar{t} = \frac{r_1}{V}.$$

From (4) it is possible to define particular value $\Delta m_1 = \Delta \overline{m}_1$, suitably time $\Delta \bar{t}$,

$$\Delta \overline{m}_1 = \frac{\gamma * m_1^2}{4\pi^2 r_1^4 V} \cdot \Delta \bar{t} = \frac{\gamma * m_1^2}{16\pi^2 r_1^3 V^2} = \frac{\gamma m_1^2}{4\pi r_1^3 V^2} \quad . \qquad (6)$$

Value $\Delta \overline{m}_1$ falls into to processing of simple body mass carried to its simple surface. General meaning $\Delta \overline{M}_1$, m_1 relating to all mass, will make

$$\Delta \overline{M}_1 = \Delta \overline{m}_1 \cdot 4\pi r_1^2 = \frac{\gamma * m_1^2}{4\pi r_1 V^2} = \frac{\gamma m_1^2}{r_1 V^2}.$$

Let's consider action (6) on example of Earth (r_1=6,4 · 10^6 m; m_1=6,6 · 10^{24} kg, $\gamma^* = 4\pi \cdot 6{,}67 \cdot 10^{-11}$ N · sq.m/kg^2, where 6,67·10^{-11} N · sq.m/kg^2 (m3/kg · sec. ^{2}) – traditionally represented by gravitational constant γ). Let's accept value of V equal to light velocity, V=3·108 m/s., though dependences (4), (6) do not impose restriction on value of velocity V. From (6) exit of gravitons to Earth surface corresponds

$$\Delta \overline{m}_1 = \frac{6{,}67 \cdot 10^{-11} \cdot (6{,}6 \cdot 10^{24})^2}{4 \cdot 3{,}14 \cdot (6{,}4 \cdot 10^6)^3 \cdot (3 \cdot 10^8)^2} \approx 9{,}80 \ \ кг / м^2$$

to

$$\Delta \bar{t} = \frac{6{,}4 \cdot 10^6}{3 \cdot 10^8} = 2{,}133 \cdot 10^{-2} \ \ сек.$$

Thus on formation of one exit graviton to unit of Earth surface it is processed sign (considering that by m a=9,8 / sec^2) the size of 9,8 kg/sq.m. This (visibly vital) equality is correct only for planet Earth. From other planets of our Solar system only Venus comes nearer to this equality a little. For other planets this equality is considerably broken if, of course, to consider that velocities of graviton emission V for all masses remain identical.

It is possible that graviton velocity considerably exceeds light velocity, then value Δm_1 can decrease considerably, besides, if gravitons possess mass, size Δm_1 will be formed as well of this mass.

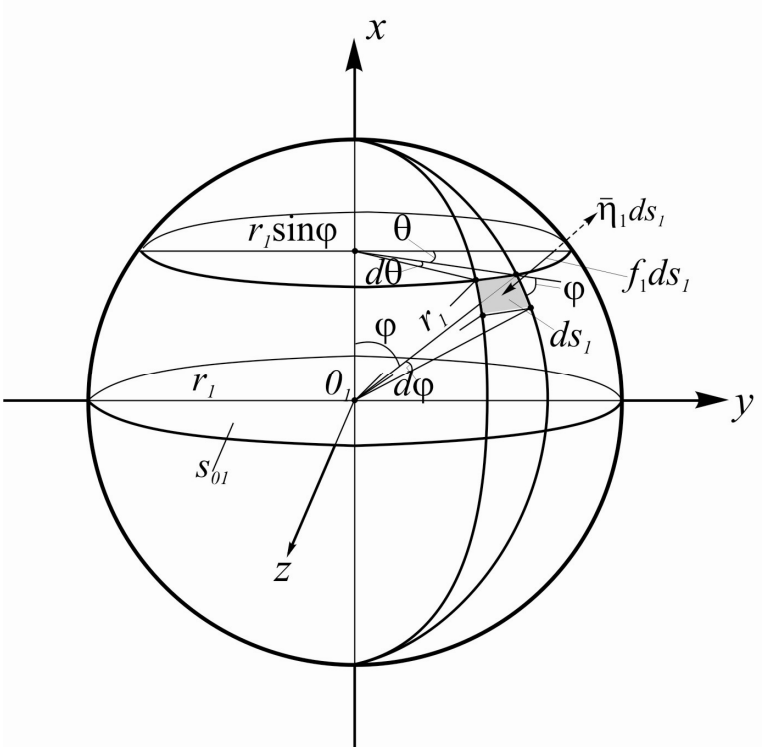

Fig. 1: Gravitational compression scheme of graviton body emissions

4. MASS GRAVITATIONAL COMPRESSION

Let's consider projections of distributed forces f_1 applied to surface of a globe m_1 to axes x, y, z (fig. 1). According to fig. 1 loading enclosed on the surface element of ds1 makes

$$f_1 ds_1 = f_1 r_1^2 \sin\varphi d\theta d\varphi ,$$

and projection of this load of an axis x will be equal

$$- f_1 ds_1 \cos\varphi = - f_1 r_1^2 \sin\varphi \cos\varphi d\theta d\varphi .$$

Thus common projection makes

$$- \int_{\circ}^{2\pi} d\theta \int_{\circ}^{\pi} f_1 r_1^2 \sin\varphi \cos\varphi d\varphi = - \frac{\pi r_1^2 f_1}{2} (1-1) = 0$$

It is similarly possible to show that projections of gravitational compressive forces f_1 applied to a globe surface to axes y, z are also equal to zero.

5. GRAVITATIONAL ATTRACTION FORCES DEFINING

Thus, action of gravitons becomes like multifold uniform action of minijet elements. Thus, gravitational compression forces of all sphere multifold even load of f_1 form the stable self-balance system of forces directed on fixing of a body in a point of world space which however can be broken by a gravitational attraction of other bodies. Let apart R from a body of m_1 be a similar body of m_2, r_2 (R – center distance of m_1 and m_2 mass). Thus for m_2 body in the equation (4) lower index 1 is replaced by the 2 index,

$$f_2 = \frac{\gamma^* m_2^2}{16\pi^2 r_2^4} = \overline{\eta}_2 m_{02} V . \qquad (7)$$

At the review of gravitons $\overline{\eta}_1$ on m_2 body and $\overline{\eta}_2$ on m_1 body it is necessary to consider a number of factors, first of all, the factor of their dispelling [3]. In relation to the considered model apart R conditions of graviton streams dispelling $\overline{\eta}_1$ and $\overline{\eta}_2$ [2] is presented in the form:

$$\overline{\eta}_{12} = \overline{\eta}_1 \frac{4\pi r_1^2}{4\pi R^2} = \overline{\eta}_1 \frac{r_1^2}{R^2}, \quad \overline{\eta}_{21} = \overline{\eta}_2 \frac{4\pi r_2^2}{4\pi R^2} = \overline{\eta}_2 \frac{r_2^2}{R^2} \qquad (8)$$

Let's consider influence of one more factor. Spheres the radius of R cut off in globes of m_1 and m_2 of section of S_{01}, S_{02}, passing through points of their barycentres of O_1 and O_2 (fig. 2 and, b). Streams $\overline{\eta}_{12}$ and $\overline{\eta}_{21}$ affect on O_1 lines – O_2 (fig. 2 and, b) simple values of surfaces of S_{01}, S_{02} at points of O_1, O_2. when determining action of these streams on other parts of sections of S_{01}, S_{02} it is necessary to consider influence of bodies sphericity. Let's allocate m_2 body for this purpose from fig. 2 and as an example,

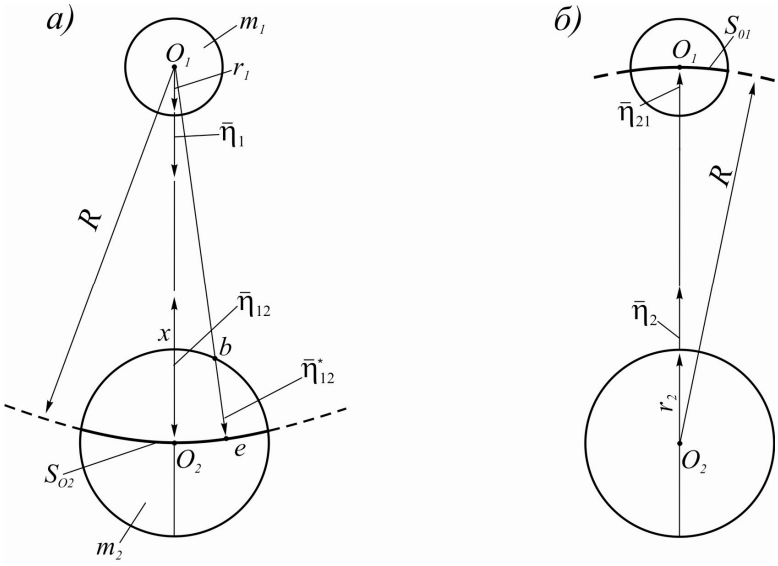

Fig. 2: Graviton body streams attraction interaction scheme

fully presented in fig. 3. We believe that it is possible to neglect S_{02} section curvature, replacing it with flat section, normal to an axis x (fig. 3). The graviton quantity coming to S_{02} surface unit at a point of O_2 will make $\overline{\eta}_{12}\frac{r_2}{V}$. The similar graviton quantity will come to S_{02} surface unit at the arbitrariest point of *e*, however in m_2 body they will pass a piece of *b-e* which length according to fig. 3 is equal $e_{be}=\frac{r_2}{cos\varphi}$. It is possible if $\overline{\eta}_{12}$ changes. Let's mark changeable value in the form of $\overline{\eta}^*_{12}$ which is from equality $\overline{\eta}\frac{r}{V}=\overline{\eta}^*_{12}\frac{r_2}{V\cos\varphi}$, from where

$$\overline{\eta}^*_{12}=\frac{\overline{\eta}_{12}}{cos\varphi}, \tag{9}$$

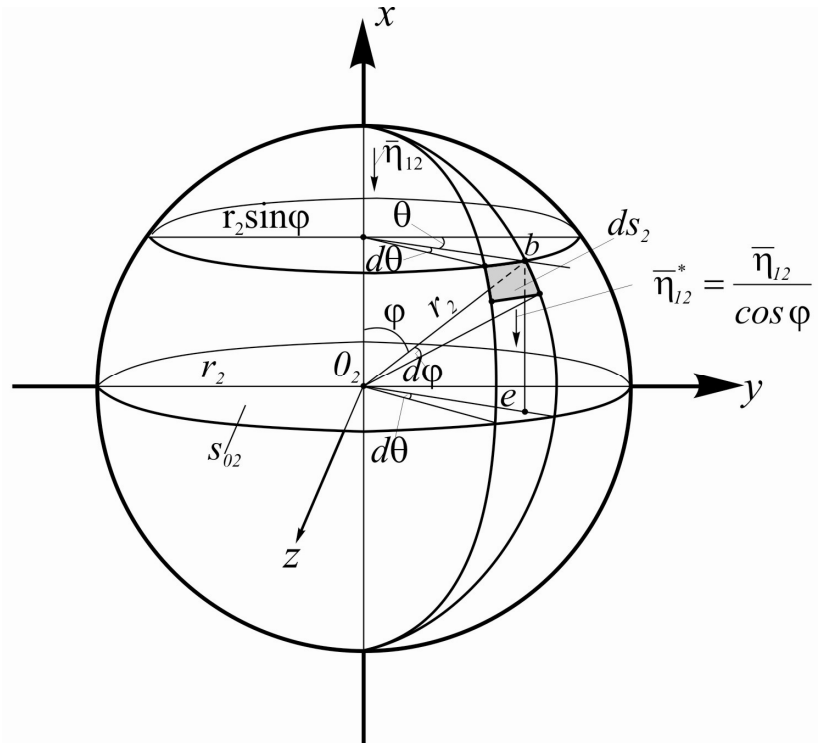

Fig. 3: The action scheme of graviton stream of body m_1 on m_2 body

With similar values $\overline{\eta}^*_{12}$ these (or preceding) stream takes place in second part of m_2 globe located below S_{02}. as a result the common stream $\overline{\eta}_{5\,12}$ crossing the sphere of m_2 above and below S_{02} can be defined according to fig. 2 from expression

$$\overline{\eta}_{5\,12} = \iint_s \overline{\eta}^*_{12} ds_2 \cos\varphi = \iint_s \overline{\eta}_{12} ds_2 = \int_0^{2\pi} d\theta \int_0^{\pi} \overline{\eta}_{12} r_2^2 \sin\varphi d\varphi = 4\pi r_2^2 \overline{\eta}_{12} \quad (10)$$

Force of F_{12} with which graviton streams of $\overline{\eta}_{12}$ bodies of m_1 affect all body m_2, and force of a backward direction of F_{21} with which graviton streams of $\overline{\eta}_{21}$ bodies of m_2 affect all body of m_1 is defined with the specified effects,

$$F_{12} = \overline{\eta}_{s12} m_{02} V = 4\pi r_2^2 \overline{\eta}_{12} m_{02} V = \overline{\eta}_1 \frac{r_1^2}{R^2} 4\pi r_2^2 m_{02} V ,$$

$$F_{21} = -\overline{\eta}_2 \frac{r_2^2}{R^2} 4\pi r_1^2 m_{01} V \quad (11)$$

According to the physical law "action is equal to counteraction" we accept

F_{12}=–F_{21}=F. Thus

$$F_{12}\cdot(-F_{21})=F^2 \qquad (12)$$

Substituting values F_{12} and F_{21} of (11) in equation (12), we find

$$F^2=\frac{16\pi^2\overline{\eta}_1\overline{\eta}_2 r_1^4 r_2^4 m_{01}m_{02}V^2}{R^4}. \qquad (13)$$

From (4) and (7) follows

$$\overline{\eta}_1=\frac{\gamma^* m_1^2}{16\pi^2 r_1^4 m_{01}V};\ \ \overline{\eta}_2=\frac{\gamma^* m_2^2}{16\pi^2 r_2^4 m_{02}V}\ . \qquad (14)$$

Substitution of values $\overline{\eta}_1$ and $\overline{\eta}_2$ of (14) in (13) results in functional connection:

$$F^2=\frac{(\gamma*)^2 m_1^2 m_2^2}{16\pi^2 R^4},$$

where

$$F=\pm\frac{\gamma^* m_1 m_2}{4\pi R^2}=\pm\frac{\gamma m_1 m_2}{R^2}. \qquad (15)$$

At a sign $\langle+\rangle$ we come to Newton's law of gravitation that confirms possibility of jet nature of gravity.

Let's notice that condition (15) will be met and in case velocities of graviton emission V for each mass differ (in formula (4) $V=V_1$, and formula (7) $V=V_2$).

6. DOWNLOADING GRAVITONS PHENOMENON.

Let's point to one possible phenomenon. Graviton emission from mass can alternate with entry into it by downloading of new portion of gravitons surrounding mass. Thus by analogy with (4) forces of $f_{1\,(3)}$ – action of downloading to unit mass, it is possible to present in the form:

$$f_{1(3)}=\pm\frac{\Delta m_{1(3)}}{\Delta t}V_{(3)}=\pm\frac{\Delta\eta_{1(3)}m_{01(3)}}{\Delta t}V_{(3)}=\pm\overline{\eta}_{1(3)}m_{01(3)}V_{(3)}, \qquad (16)$$

where 3 index specifies that specified in (4), (5) sizes fall into downloading gravitons. We can see that V (3) (in case of sign "-" in (16)) much less than V therefore the effect of downloading shows poorly.

An interesting case where

$$f_{1(3)} = f_1 = \frac{\gamma^* m_1^2}{16\pi^2 r_1^4} = \frac{\Delta\eta_{1(3)} m_{01(3)}}{\Delta t} V_3 = \overline{\eta}_{1(3)} m_{01(3)} V_3 \ , \qquad (17)$$

$$\overline{\eta}_{1(3)} = \overline{\eta}_1 \qquad (18)$$

When keeping to condition (17) gravitational compressive forces of mass of m_1 at the alternating emissions and downloading gravitons remain identical. According to condition (18) role of mass will be reduced only to emission and downloading gravitons and does not fall into their formation. However this question still demands further researches.

It is necessary to notice still that direction and traveling velocity of a body can influence graviton emission and downloading. However these questions demand separate consideration.

7. CONCLUSIONS

Presented jet model of gravitational attraction body transfer by graviton streams which are in a special way formed by the mass of bodies, leads to the law of attraction by I. Newton, which points to its validity.

8. SUMMARY

Thus all aspects of body gravitational attraction jet model based on determined consistent patterns of formation and jet emission of graviton streams due to processing of body mass, their dispelling in process of receding from the center of body mass and the subsequent influence on counter bodies in the form of attraction forces which lead to the law of attraction by I.Newton are considered . The model is supplemented by possible downloading gravitons in mass which can alternate with their emission.

CONFLICT OF INTEREST

Author confirms that data presented does not contain conflict of interests.

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