AMPLITUDES OF GRAVITON

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For the successful decision of any problem it is necessary logically clearly and mathematically simply to formulate this problem. In this case our problem consists in resulting concepts of the mechanical moments of the bodies, used in the standard paradigm, in one universal parametre.
<u>The moment of quantity of movement</u> (the impulse moment) of material point concerning the rotation centre is defined as vector product of a radius-vector of a point on quantity of movement of this point. The moment vector is defined by a rule of the right gimlet.

$$\vec{p}_{si} = [\vec{r}_i \cdot M_i \cdot \vec{\upsilon}_i] \qquad |(\mathrm{kg}\times\mathrm{m}^2)/\mathrm{s}|$$

It is possible to express speed υ_i through angular speed of a point ω_i, and, hence, the moment of an impulse of a point can be written down through a vector of angular speed.

$$\vec{p}_{si} = M_i \cdot r_i^2 \cdot \vec{\omega}_i = J_i \cdot \vec{\omega}_i \qquad |(\mathrm{kg}\times\mathrm{m}^2)/\mathrm{s}|$$

where $J_i = M_i \times r_i^2$ – the moment of inertia of a point concerning a rotation axis.
<u>The kinetic moment (spin) o</u>f material system concerning a pole (in this case concerning the rotation centre) is equal to the geometrical sum of the moments of quantity of movement of all points of system concerning the same pole.

$$\vec{L} = \sum_{i=1}^{n} [\vec{r}_i \cdot M_i \cdot \vec{\upsilon}_i] = \Sigma_1^n J_i \cdot \vec{\omega}_i \qquad |(\mathrm{kg}\times\mathrm{m}^2)/\mathrm{s}|$$

The problem of definition a spin of system of material points can be reduced to the decision of a problem of definition a spin of a rotating ring, the mass $\boldsymbol{M_s}$ which it is in regular intervals distributed on diameter $\boldsymbol{D_s}$. In fig.1 the hydrogen radial politron which is at energy level $\boldsymbol{m}$=4 is shown. The pair of forces ***F–F*** is applyed in points which are on distance $\boldsymbol{z = D_s/2}$ from the polytron centre.

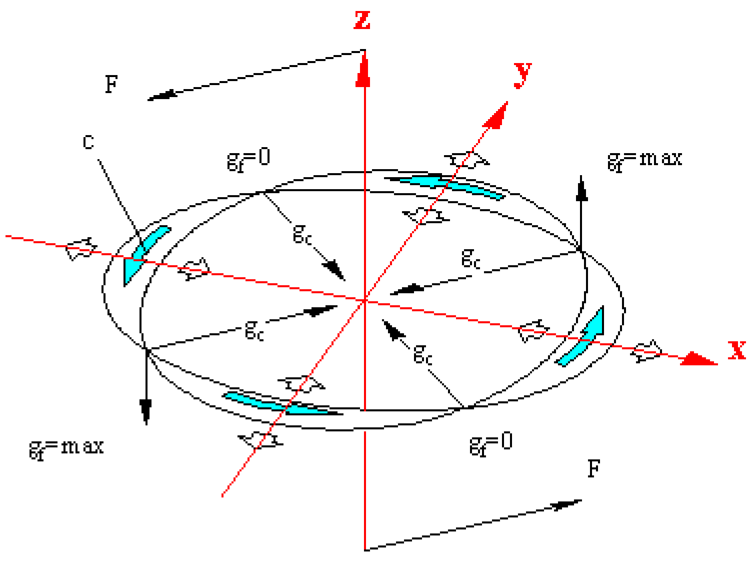

Fig. 1
Occurrence of the gyroscopic moment of inertia under action of pair forces *F–F*

At first let's consider not vibrating ring which points rotate round an axis $\boldsymbol{z}$ with speed υ. The problem consists in calculating force $\boldsymbol{F}$ and energy which are necessary for ring turn on a angle of 180 degrees round an axis ***f-f***, passing through two points in which acceleration $\boldsymbol{g_f}$ = 0.

The rotation time should be equal to a half-cycle of rotation of a ring. In this case those two points of a ring which at the moment of time $\boldsymbol{t} = 0$ are under the influence of acceleration $\boldsymbol{g_f}$ = max, at the moment of time $\boldsymbol{t = (\pi D_s) / (2\upsilon)}$ will appear on a ring opposite side, but thus there will be a turn of speed of points on 180 degrees. I.e. speed $\boldsymbol{\upsilon}$ will be go out also kinetic energy of rotation of a ring round an axis $\boldsymbol{z}$ becomes equal to zero. We assume, that this mathematical method of clearing of speed of rotation will allow to receive authentic physical result for calculation of the kinetic moment.

Kinetic energy of rotation of a ring round an axis $\boldsymbol{z}$ is equal

$$W_z = \frac{M_s \cdot \upsilon^2}{2} = \frac{M_s \cdot D_s^2 \cdot \omega_z^2}{8} \quad |\mathrm{J}| \qquad (1)$$

where $\omega_z = (2\times\upsilon)/D_s$ – angular speed of rotation of a ring round an axis $\boldsymbol{z}$.

The moment of inertia of a ring concerning an axis $\boldsymbol{z}$ is equal

$$J_z = \frac{M_s \cdot D_s^2}{4} \quad |\mathrm{kg}\times\mathrm{m}^2| \qquad (2)$$

The moment of an impulse (angular momentum) of the ring rotating round an axis $\boldsymbol{z}$**,** is equal:

$$p_z = J_z \cdot \omega_z \quad |(\mathrm{kg}\times\mathrm{m}^2)/\mathrm{s}| \qquad (3)$$

Besides, we should consider kinetic energy, the moment of inertia and the moment of an impulse of a ring concerning an axis ***f-f***.

The moment of inertia of a ring, in a state of full rest, concerning an axis ***f-f*** is twice less, than the moment of inertia of a ring concerning an axis $\boldsymbol{z}$

$$J_{ff} = \frac{M_s \cdot D_s^2}{8} \quad |\mathrm{kg}\cdot\mathrm{m}^2| \qquad (4)$$

Accordingly, kinetic energy and the moment of an impulse of a ring, at rotation concerning an axis ***f-f*** also will be twice less:

$$W_{ff} = \frac{M_s \cdot \upsilon^2}{4} = \frac{M_s \cdot D_s \cdot \omega_z^2}{16} \quad |\mathrm{J}| \qquad (5)$$

$$p_{ff} = \frac{1}{2} \cdot J_z \cdot \omega_z = J_{ff} \cdot \omega_{ff} \quad |(\mathrm{kg}\times\mathrm{m}^2)/\mathrm{s}| \qquad (6)$$

The period of one half-turn of a ring concerning an axis ***f-f*** should coincide with the period of one half-turn of a ring round an axis $\boldsymbol{z}$: $\tau_{ff} = \tau_z = \pi/\omega_z$

Then angular acceleration with which the ring should turn round an axis ***f-f***, and also delay of rotation of a ring round an axis $\boldsymbol{z}$**,** should be:

$$\varepsilon_{zf} = \frac{\omega_z}{\tau_z} = \frac{\omega_z^2}{\pi} \quad |\mathrm{rad/s}^2| \qquad (7)$$

According to Newton's second law, change of the moment of an impulse to equally moment of the forces enclosed to a ring:

$$p_z + p_{ff} = \left(J_z + J_{ff}\right) \cdot \varepsilon_{zf} = \frac{3 \cdot M_s \cdot \upsilon^2}{2 \cdot \pi} = F \cdot D_s \quad |(\mathrm{kg}\times\mathrm{m}^2)/\mathrm{s}| \qquad (8)$$

Applying to the formula (8) expression for centripetal acceleration of points of a ring $\boldsymbol{g_\upsilon}=(2\times\upsilon^2)/D_s$, we will receive following expression for forces $\boldsymbol{F}$ of the twisting moment:

$$F = \frac{3 \cdot M_s \cdot \upsilon^2}{2 \cdot \pi \cdot D_s} = \frac{3 \cdot M_s}{4 \cdot \pi}\left(\frac{2 \cdot \upsilon^2}{D_s}\right) = \frac{3 \cdot M_s \cdot g_\upsilon}{4 \cdot \pi} \quad |\mathrm{N}| \qquad (9)$$

Substituting in the formula (9) value of mass of electron $M_e = 9.10938188\times10^{-31}$ |kg|, value of a velocity of light in vacuum $c = 299792458$ |m/s | and diameter of hydrogen polytron
$D_s = 197.714\times10^{-12}$ |m|, we receive force for electron

$$F_c = \frac{3 \cdot M_e \cdot c^2}{2 \cdot \pi \cdot D_s} = \frac{3 \cdot M_e \cdot g_c}{4 \cdot \pi} = 1.977126 \times 10^{-4} \quad |\mathrm{N}| \qquad (10)$$

where $\boldsymbol{g_c} = (2\times c^2)/D_s = 9.091467\times10^{26}$ |m/s²| – centripetal acceleration on a line of static diameter of electron.

If after turn of a ring round an axis ***f-f*** on a corner $\boldsymbol{\pi}$ to clean action of pair forces ***F–F*** the ring will rotate by inertia with angular speed $\boldsymbol{\omega_z}$, but now it will not rotate round an axis ***z***.

The full work made in pair of forces ***F–F*** for a time interval $\tau_{ff} = \tau_z = \pi/\omega_z$ is equal

$$W_{zf} = \left(\frac{3 \cdot M_e \cdot c^2}{2 \cdot \pi \cdot D_s}\right) \cdot \left(\frac{\pi \cdot D_s}{2}\right) = \frac{3 \cdot M_e \cdot c^2}{4} = 6.14 \times 10^{-14} \quad |\mathrm{J}| \qquad (11)$$

One quarter of this work is used now for rotation of electron round an axis ***f-f*** (see the formula (5)), and two quarters are internal energy of electron which moves on perimetre of a ring with a speed of light.

$$W_z = \frac{M_e \cdot c^2}{2} = 4.093522 \times 10^{-14} |J| = 255500 |eV| \qquad (12)$$

Second half full of "energy of rest» of electron is resonant energy of radial oscillations of internal linear energy of electron:

see: http://vlamir43.narod.ru/THE_ELECTRICAL_WIND_e.pdf

Comparing qualitative and quantitative characteristics of the "girdled" gamma quantum (electron) and the "straightened" gamma photon it is possible to assume, that the mass of electron is bonded with curvature of speed in a ring whereas mathematical curvature is equal in a gamma photon to infinity, therefore the photon has no mass.

The classical formula for centripetal acceleration on a line of a circle of diameter $\boldsymbol{D_s}$ for speed of movement with a speed of light ***c*** looks like

$$g_c = \frac{2 \cdot c^2}{D_s} \quad |\mathrm{m/s^2}| \qquad (13)$$

If to increase centripetal acceleration by half of mass of rest of electron we will receive value of centrifugal force for a material point in mass $\boldsymbol{M_e/2}$:

$\boldsymbol{F_c} = 4.140882\times10^{-4}$ |N| = 1.28 |dn|

Actually " mass" is distributed in regular intervals on all perimetre of a ring, therefore the correct formula for calculation of linear centrifugal force looks like:

$$F_c = \frac{M_e \cdot c^2}{\pi \cdot D_s^2} \quad |\mathrm{N/m}| \qquad (14)$$

$\boldsymbol{F_c} = 6.666618\times10^{5}$ |N/m|

It is obvious, that in a direction of axis **Z** curvature of speed is absent, therefore for calculation of average value of centripetal acceleration in three-dimensional space we should multiply value $\boldsymbol{g_c}$ under the formula (13) by 2/3.

In our model dipoles of speed of the first kind, located on a line of circle $\boldsymbol{D_s}$, are capable to induce centripetal acceleration ***g (x)*** on any distance ***x*** from the ring centre in plane ***XY***, except area closed in a ring, and by means of photons to transfer the information on magnitude of this acceleration.

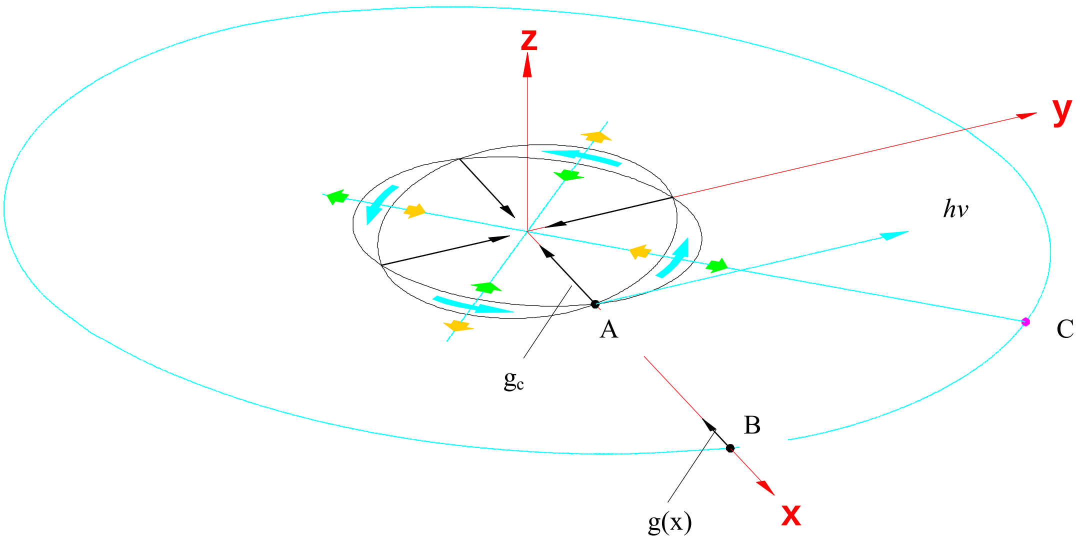

Fig. 2
Geometrical interpretation of inducting a gravitational constant

The formula for calculation of absolute value of centripetal acceleration on distance $\boldsymbol{x}$ from the ring centre in plane $\boldsymbol{XY}$ is deduced empirically:

$$g(x) = \frac{D_s \cdot c^2}{2 \cdot x^2} \qquad |\mathrm{m/s^2}| \qquad (15)$$

At $x = D_s/2$ centripetal acceleration $g(x) = g_c$; for $x < D_s/2$ the formula (15) is inapplicable, as laws of gravitation in atoms are unknown to us.
Average value of centripetal acceleration for three-dimensional space is calculated under the formula:

$$\overline{g}(x) = \frac{2}{3} \cdot g(x) = \frac{D_s \cdot c^2}{3 \cdot x^2} = 6.59 \cdot 10^{-11} \cdot \frac{c^2}{x^2} \qquad |\mathrm{m/s^2}| \qquad (16)$$

The gravitational constant is equal:

$$G = 6.673 \times 10^{-11} \qquad |\mathrm{m^2/kg}| \times |\mathrm{m/s^2}| \qquad (17)$$

Comparing units of measure in expressions (16) and (17) we can draw a logic conclusion, that the superficial density of mass in a gravitational constant is equivalent to linear density of light energy (a quadrate of a speed of light*)* in ring elements of atoms under the formula (16).

The ration $\dfrac{\overline{g}(x)}{G} = 0.988 \rightarrow 98.8\%$. The mass of hydrogen and helium in the Universe to mass of all substance in it have the same percentage.

Having executed simple transformations, we can define a light equivalent of full mass of electron (positron) β_c :

$$\beta_c = \frac{M_e}{c} = 3.038563 \times 10^{-39} \qquad |\mathrm{kg \times s}|/|\mathrm{m}| \qquad (18)$$

Full energy of electron (or mass of rest of this uneasy corpuscle) consists of two equal parts. One part – quiet, in the form of energy circulating in a ring with a speed of light; the second part –

resonant, in the form of oscillations of a ring with frequency ν, depending on at what frequency quantum level is at present electron.
At vibration of a ring (quantoide) in its various points curvature continuously varies. Hence, centripetal acceleration in these points also continuously varies with frequency ν.
We will execute calculation for frequency quantum levels ***m = 4*** (see Fig.2) and ***m = 2.***
The equation of a radial quantoide completely describes position of any point of a ring in polar co-ordinates at any moment.

$$\rho(m, n_r, t, \phi) = \frac{D_s \cdot \sqrt{m^2 + n_r^2 \cdot \cos\left(\frac{m \cdot \phi}{2}\right) \cdot \left|\cos\left(\frac{m \cdot \phi}{2}\right)\right| \cdot \cos(2 \cdot \pi \cdot \nu \cdot t)}}{2 \cdot m \cdot \left[\frac{64 \cdot (m^2 + 4) + n_r^2 \cdot [\cos(2 \cdot \pi \cdot \nu \cdot t)]^2}{64 \cdot (m^2 + 4)}\right]} \qquad (19)$$

The maximum and minimum curvature of a quantoide will be observed in a direction of polar angles $\phi = \pi/4, 3\pi/4, 5\pi/4$ и $7\pi/4$, during time moments $t = 0$ and $t = 1/2\nu$.
Let's calculate values of a radius-vector ρ for these moments of time ($n_r = 0.61325$)

$\rho_{max} = \rho(4, 0.61325, 0, \pi/4) = 9.998268\times10^{-11}$

$\rho_{min} = \rho(4, 0.61325, 0, 3\pi/4) = 9.765960\times10^{-11}$

According to the formula (16) average value of a radius-vector ρ with the amendment 0.988 numerically coincides with value of a gravitational constant. Therefore, not carrying out intermediate transformations, we will calculate at once average values of oscillations of the gravitational constant, i.e. amplitude of gravitons

$$\Delta G(m = 4) = \frac{\rho_{\max} - \rho_{\min}}{3 \cdot 0.988} = \pm 0.078377 \times 10^{-11} \rightarrow \pm 1.17\% \qquad (20)$$

For the electron which is at quantum level ***m = 2***, amplitude of gravitons, accordingly, will be

$$\Delta G(m = 2) = \frac{\rho_{\max} - \rho_{\min}}{3 \cdot 0.988} = \pm 0.153154 \times 10^{-11} \rightarrow \pm 2.3\% \qquad (21)$$

From resulted above calculations follows, that gravitons, if they exist, have infinite set of amplitudes. Besides, as is shown in fig.2, if gravitons are capable to raise a variable gravitational field with increase in distance from a gravitation source (see a point ***C*** in fig. 2), the induced amplitude will be will decrease in inverse proportion to a square of distance from a gravitation source.

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