Orbital Motion of Gravibodies and Bodies

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Abstract.

In given article is opened the principle and the condition of orbital motion of gravibodies on a constant orbit round more massive egravibody. In given article also openly why around body can not be an orbital motion other bodies and why the bodies can not have a constant orbit round a gravibody.

Given article is a part of "Real theoretical physics on the basis of existence of the ether" which I have opened on the basis of definition of properties of initial particles - mats. All known elementary particles and the ether consist of the mats. The gravibodies are formed on the basis of supermats, which are being in the central part of each gravibody. In the new theoretical physics is opened the interaction of the ether with the elementary particles and bodies. Herewith the essence of all physical phenomena is reveals. "The real theoretical physics" is strictly materialistic.

1 Motion of Bodies and Gravibodies Around of a More Massive Gravibody

Bodies and gravibodies that move freely in the gravitational field of a more massive gravibody have a curvilinear free-gravitational motion round this more massive gravibody. Owing to the gravitational field of the massive gravibody, the less massive bodies are attracted to it. The trajectory of the motion of bodies and gravibodies, which bypasses a more massive gravibody can be bending, twisting, or orbital, depending on the ratio of the gravitational acceleration to the free velocity of the body (gravibody) in the point, where they have a perpendicularity to each other.

Circular orbital motion of an gravibody begins on that distance from the center of the massive gravibody when the corner between the vector of free acceleration and the vector of the gravitational field becomes 90. Before that the corner is less than 90.

The orbital motion of a gravibody round a more massive gravibody may also be elliptic in case of influence of other gravibodies. For example, the orbits of the planets of the solar system are not circle (circumference) due to the attraction between the planets. Also a result of this attraction the orbits of all planets lie in one plane.

Bodies cannot have orbital motion around bodies; they can have it only around gravibodies, since any body has such density at which the ethermats passes through a body almost without resistance, why around of the bodies is very weak a ethereal field is created. The gravibodies have the much greater density than the bodies and in the gravibodies are being supermats, due to which around a gravibody a strong ethereal field (a gravitational field)is createdAround a gravibody can be a orbital motion not only gravibodies and bodies, but also elementary particles, for example the orbital motion of protons of magnetosphere of the Earth.

A supergravibody cannot have orbital motion round another gravibody, since the ratio of the gravitational acceleration to free acceleration in supergravibodies is less than in less massive gravibodies; due to that, free acceleration of supergravibodies is unsufficiently offset by gravitational attraction to another supergravibody.

2 The Principle of Orbital Motion of Gravibodies and Bodies

If a gravibody is in orbital circular motion round a more massiv central gravibody, then the orbital velocity of motion of that gravibody is uniform, $V_t = V_{\mathrm{t}-1} = V_{\mathrm{t}+1}$. But the vector of this orbital velocity is constantly changing its position. Such motion is formed due to the fact that the vector of the orbital velocity, V, consists of the vector of free velocity, V_{free}, and the vector of gravitational acceleration, ΔV_g, having a different direction.

$$V = V_{\mathrm{free}} + \Delta V_g.$$

The vector of the free velocity V_{free} at time t consists of the orbital velocity at time $t-1$, of free acceleration ΔV_{free} and of the etereal deceleration ΔV_{ed}:

$$V_{\mathrm{free}} = V_{\mathrm{t}-1} + \Delta V_{\mathrm{free}} - \Delta V_{\mathrm{ed}}$$

Fig. **??** shows the components of velocity of the circular orbital motion of a gravibody.

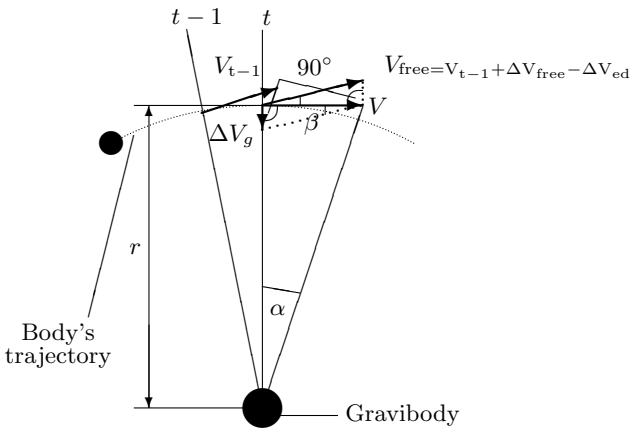

Figure 1: Circular orbital motion of a gravibody.

We can see from the scheme in Fig. **??** that

$$\frac{r}{V} = \frac{V}{\Delta V_g},$$

From the latter expression the radius of the circular orbital motion of a gravibody around the central gravibody is:

$$r = \frac{V^2}{\Delta V_g}.$$

$$\Delta V_g = E_g \cdot K_f$$

$$E_g = \frac{M_c}{r^2} \cdot K_g \quad ,$$

$$r = \frac{V^2}{\Delta V_g} = \frac{V^2}{E_g \cdot K_f} = \frac{V^2 \cdot r^2}{M_c \cdot K_f \cdot K_g},$$

$$r = \frac{M_c}{V^2} \cdot K_f \cdot K_g = \frac{M_c}{V^2} \cdot G_g,$$

where M_c is the mass of the central gravibody, r the radius of the orbital motion of the gravibody, V the orbital (linear) velocity of the orbital motion of the gravibody, ΔV_g the gravitational acceleration of the orbital gravibody, E_g the strength of the gravitational field of the central gravibody at the

location of the orbital body, G_g the constant of the gravitational force of gravibodies, K_g the force constant of gravitational field, and K_f the constant of field acceleration of elementary particles.

The gravibodies because of presence in them the supermats, are having such character of change of the free acceleration and the ethereal deceleration, that when they became equality, then the gravibodies have so big ratio of the limit of free velocity to the gravitational acceleration, at which the gravibodies can have a orbital motion on a constant orbit.

Bodies cannot have an circular free orbital motion on a constant orbit. The radius of orbital motion of bodies constantly decreases. From the fig.1 follows, that for circular orbital motion of a body, the vector of velocity of the orbital motion should be perpendicular to the gravitational acceleration of the body, and that is possible if the free velocity in a sufficient measure exceeds the gravitational acceleration. But, the free velocity of bodies, unlike of the gravibodies, consists not only of the free acceleration ΔV_{free} and the ethereal deceleration ΔV_{ed}, but also of orbital deceleration of atoms ΔV_{ed}:

$$V_{\text{free}} = V_{\text{t}-1} + \Delta V_{\text{free}} - \Delta V_{\text{ed}} - \Delta V_{\text{od}}$$

The orbital deceleration of atoms considerably reduces the free velocity of bodies, due to that the free motion of bodies compensates the gravitational acceleration insufficiently, and because of this body cannot have orbital motion in a constant orbit.

Apparently the principle of orbital motion of electrons around of a nucleus on the first orbit of atoms is identical to the principle of orbital motion of the gravibodies around of a central gravibody. It occurs due to that, that the mats of electrons have a insignificant freedom of motion relatively each other inside of an electron, also as the supermats inside the gravibodies. Therefore the mats of electrons as well as the supermats of the gravibodies have such greater limit velocity of free motion, which is sufficient for constant orbital motion.

3 Orbital Constant for the Motion of Gravibodies Round the Central Gravibody

The dependence of the orbital parameters of a gravibody on the mass of the central gravibody can be derived from the formulas:

$$M_c = \frac{V^2 \cdot r}{G_g}.$$

Round the sun ($M_c = 1.989 \cdot 10^{30}$ kg)					
Planet	Density $\Pi, (\frac{\text{g}}{\text{cm}^3})$	Orbital velocity $V, (\frac{\text{km}}{\text{sec}})$	Radius of orbit r, (km)	Orbital constant $V^2 \cdot L$	Mass Earth=1
Mercury	5.44	47.9	$57.9 \cdot 10^5$	$1.328 \cdot 10^{10}$	0,06
Venus	5.27	35.05	$108.2 \cdot 10^5$	$1.325 \cdot 10^{10}$	0,82
Earth	5.52	29.8	$149.6 \cdot 10^5$	$1.328 \cdot 10^{10}$	1
Mars	3.95	24.14	$228 \cdot 10^5$	$1.328 \cdot 10^{10}$	0,11
Jupiter	1.31	13.06	$78.4 \cdot 10^5$	$1.328 \cdot 10^{10}$	317,9
Saturn	0.70	9.65	$1425 \cdot 10^5$	$1.327 \cdot 10^{10}$	95,2
Uranus	1.21	6.8	$2867 \cdot 10^5$	$1.326 \cdot 10^{10}$	14,6
Neptune	1.66	5.43	$4486 \cdot 10^5$	$1.323 \cdot 10^{10}$	17,2
Pluto	0.80	4.74	$5890 \cdot 10^5$	$1.323 \cdot 10^{10}$	0,01
Round the Earth ($M_c = 5.977 \cdot 10^{24}$ kg)					
Moon	3.34	1.02	$3.844 \cdot 10^5$	$4 \cdot 10^5$	
Round Mars ($M_c = 6.5747 \cdot 10^{23}$ kg)					
Phobos		2.1387	9379	$0.429 \cdot 10^5$	
Deimos		1.35	23459	$0.4275 \cdot 10^5$	

Table 1: Orbital constant.

Since for a given central gravibody M_c is constant, the product $V^2 \cdot r$ is also constant and is called the *orbital constant* for gravibodies that move round a central gravibody along a circular orbit. Thus the radius of constant orbital motion of gravibodies depends on the velocity of the orbital motion.

The value of orbital constant can be determined by using the solar system as an example. The parameters of the solar system are well known. In Table **??** the value of orbital constant is determined for the planets of the solar system and for satellites of the Earth and Mars.

The orbital constant for bodies and gravibodies rotating round the sun equals $1.325 \cdot 10^{10}$ approximately; the orbital constant for bodies and gravibodies rotating round the Earth is $4 \cdot 10^5$, and round Mars $0.428 \cdot 10^5$.

These data confirm the fact that the radiuses of circular orbital motion of the gravibodies (planets of the solar system) inversely to a square of the

velocity of their orbital motion. The velocity of orbital motion of the gravibodies is directly proportional to mass of all supermats of an gravibody and does not depend on the general mass of the gravibody. Herewith, the density of gravibody in a great extent, but not quite, reflects the concentration of the supermats in the gravibody.

4 Determination of Velocity of Orbital Motion of Bodies.

From the above formula one can also determine the velocity of orbital motion of a body round a gravibody. For instance, the velocity of orbital motion of a body near the Earth is:

$$V = \sqrt{\frac{M_c \cdot G_g}{r}} = \sqrt{\frac{6 \cdot 10^{24} \cdot 6.67 \cdot 10^{-11}}{6.4 \cdot 10^6}} = 7.9 \text{ km/s}$$

This is the minimal velocity which a body should have in order to come to the nearest space orbit round the Earth in vertical motion.

The velocity of orbital motion of a body near the Sun is:

$$V = \sqrt{\frac{M_c \cdot G_g}{r}} = \sqrt{\frac{2 \cdot 10^{30} \cdot 6.67 \cdot 10^{-11}}{7 \cdot 10^8}} = 435.5 \text{ km/s}$$

The orbital velocity of the Earth round the Sun is:

$$V = \sqrt{\frac{M_c \cdot G_g}{r}} = \sqrt{\frac{2 \cdot 10^{30} \cdot 6.67 \cdot 10^{-11}}{149.6 \cdot 10^9}} = 29.86 \text{ km/s}$$

If the planets moving round the Sun have originated from the Sun, then depending on their initial velocity upon their leaving the Sun, they have come on different solar orbits. As the move farther from the Sun, they velocities decreased due to the action of gravitational acceleration.

The orbital velocity of the Moon round the Earth is:

$$V = \sqrt{\frac{M_c \cdot G_g}{r}} = \sqrt{\frac{6 \cdot 10^{24} \cdot 6.67 \cdot 10^{-11}}{38.44 \cdot 10^7}} = 1.02 \text{ km/s}$$

Apparently, the formulas of orbital motion of bodies and gravibodies, determined theoretically in given article, coincide with the formulas, determined by experimentally modern theoretical physics.

Conclusion

1. Around of bodies there can be no orbital motion of other bodies, but only round the gravibodies, since bodies have small density at which ethermats pass through bodies almost unhindered; due to this a very weak ethereal field is created around the bodies. Gravibodies has considerably greater density than that of bodies and the central part of an gravibody has supermats, having absolute density. Due to this, the unit mass of a gravibody forms a considerably stronger field than the unit mass of a body. The nucleuses of atoms have considerably greater density than that of bodies, therefore around the nucleuses can be the orbital motion of other elementary particles.

2. Gravibodies can have a orbital motion with a constant orbit around of a more massive central gravibody, but the bodies cannot have a orbital motion with a constant orbit because the limit velocity of free motion of bodies much less than that of the gravibodies and because the gravitational acceleration of bodies more than that of gravibodies.

3. The Sun has a high velocity of orbital motion round the center of the galaxy, while the Earth and other planets have a lower velocity of orbital motion round the Sun, since the mass of the Sun is composed mostly of supermats and to a less degree of plasma, while the mass of planets consists more of plasma and less of supermats.

4. As the nucleus of an atom consists of the nucleons pressed to each other, then the nucleus has density as the density of a nucleus of gravibody, and therefore around a nucleus there can be an orbital motion of other elementary particles.