

# Formation and Characteristics of Gravitational Field

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**Abstract.** This article opened a physical principle of formation of the gravitational field and on basis of it reveals the characteristic of gravitational fields. This article is one of a series of articles forming "Real theoretical physics" on the basis of existence of an ether. This physics is strictly materialistic and opens essence of all physical phenomena, which always occur happen as a result of interaction of an ether with elementary particles of matter. This article reveals a physical principle of formation of the gravitational field; it also reveals the essence of gravitational fields.

## 1 The Main Characteristics of Mats and of of Ether

Elementary particles and ether consist of mats (particles of an initial matter). The ether represents the mats which move in different directions independently from each other in absolute emptiness. The ether is located between elementary particles in plasma, atoms, bodies, gravibodies and between gravibodies of the Universe.

Everyone mat separately moves only rectilinearly and with acceleration. At counter collisions of mats, the velocity of their motion decreases and the direction of their motion is changing. If the mats did not collide, their velocity could be boundless. The mats which have enough big momentum, at collision with each other can break and break off. Therefore the mats have various form and mass. The mats are characterized by sphericity of their forms. The mats which have more long form, are called longmats, and the mats which have the oval form or the spherical form, are called accordingly ovalmats and spheremats. The longmats after collisions with different mats can mainly have rotation. The spheremats and the ovalmats after collisions with different mats can have in a greater measure rectilinearly motion. The mats, having greater sphericity have greater mobility. Since the sphericity of

all mats is various, then borders between longmats, ovalmats and spheremats do not exist, she is conditional. All known elementary particles consist of longmats, and the ether consists of ovalmats and spheremats. The ether inside gravibodies and around the gravibodies consists mainly of ovalmats, and the ether of space consists mainly of spheremats. The gravibodies are formed on the basis of supermats which are in the central part of gravibodies since time of the Big Explosion.

## **2 Passage of Ethermats through Gravibodies and Bodies**

Spheremats (fast ethermats) coming from the outer ether and entering in a gravibody penetrate in it through a large number of elementary particles (neutrons, protons and electrons), which constitute plasma of the gravibody. On their way, spheremats push aside longmats of which elementary particles consist. When passing through neutrons and protons, spheremats somewhat decrease their velocities but between collisions the spheremats slightly increase their velocities due to the free acceleration. The higher is the velocity of an spheremats upon its entering a gravibody, the longer is its deceleration path in the gravibody.

Ovalmats, which enter a gravibody or a body from the outer ether unlike spheremats may pass through a considerably lesser depth of the gravibody, until when the ovalmats decelerate so as they no more decrease their average velocity. Part of the gravitational field formed by ovalmats has shorter range but is stronger than the part of the gravitational field formed by spheremats. This is due to the fact that ether has a greater number of ovalmats than spheremats.

Ovalmats from the outer ether, which enter a gravibody, may pass only through an insignificant layer of the body. Due to the collisions with elementary particles the ovalmats diminish their velocity down to the velocity of the same ovalmats located in the intrabody ether. Between spheremats and ovalmats no border, the mobility of all mats fluently changes.

## **3 Principle of Formation of Gravitational Field**

Since the fast spheremats of the outer ether decrease their velocity at passing through gravibodies, it follows that the spheremats what enter gravibodies

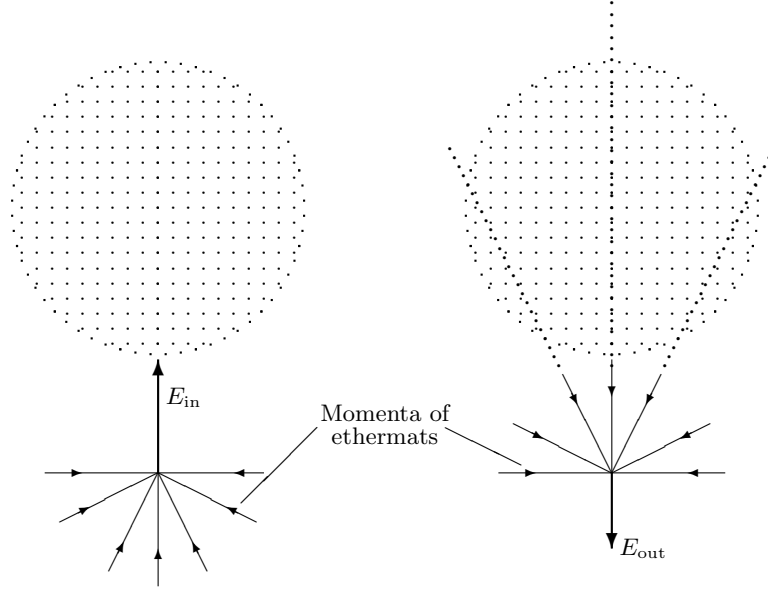


Figure 1: The intensity of momenta of the ether formed by incoming and outgoing ethermats.

have higher velocities (and, correspondingly, higher momenta) than spheremats what leave gravibodies, and move outside from the gravibody. The average velocities of sphremats, which leave the gravibody are increasing and becomes as it of the spheremats, which moves in direction to the gravibody.

Taking into account that the number of spheremats entering a gravibody and leaving it per unit of time is equal, we see that the intensity of momenta of the ether at any point near a gravibody is higher in the direction towards the center of the gravibody than that in the opposite direction.

Fig. ??, on the left, shows the intensity of momenta of the outer ether at a given point directed towards the center of a gravibody and the average momenta of ethermats which form this intensity of momenta.

The difference of the intensity of momenta of the spheremats which move through the given point towards the gravibody over the intensity of momenta of the spheremats which move through the given point from the gravibody is an ethereal field which is called the *gravitational field*. The part of the gravitational field formed inside gravibodies is called the *internal gravitational field* and the part of the gravitational field formed outside gravibodies is called the *external gravitational field*.

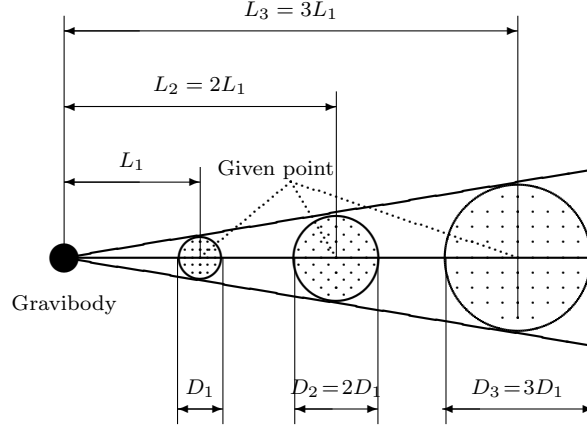


Figure 2: Strength of the etheral field.

Spheremats of gravitational field pushes the ovalmats of cosmic ether in direction of the gravitational field, due to that a big concentration of ovalmats in gravibody and its sphere.

## 4 Definition of the Strength of Gravitational Field

The strength of the gravitational field. is denoted by  $E_g$  and defined:

$$E_g = E_{\text{in}} - E_{\text{out}},$$

where  $E_{\text{in}}$  is the intensity of momenta of ethermats moving through a given point in the direction towards the gravibody and  $E_{\text{out}}$  is the intensity of momenta of ethermats moving through the given point in the direction from the gravibody.

The Fig. ??) shows a location of ethermats in space after their passing through gravibody.

The number of ethermats that pass through out a gravibody per unit of time is proportional to the area of the projection of this gravibody, and the momenta of deceleration of the ethermats proportionally to their path inside the gravibody and the density of the latter. Since the ethermats, passing through the gravibody, diminish their momenta mainly due to the collisions with the supermats of the gravibody, it follows that the strength

of the gravitational field of the gravibody at a given point (located at large distance from the gravibody relatively to its diameter) is proportional to the mass of the supermats of gravibody.

The strength of the gravitational field at a point removed from the gravibody at a distance much greater than the diameter of gravibody, decreases with increase of the distance from the gravibody, since the intensity of momenta of entering ethermats is the same at all distances from the gravibody, but the intensity of momenta of the outgoing ethermats increases due to the increase in the average velocity of their motion until they reach the average velocity of entering ethermats.

The strength of the gravitational field, decreases at the increasing of the distance from the gravibody, also due to the fact that at the distance increases, the density of the current of outgoing ethermats is decreasing, since the trajectories of outgoing ethermats are spreading in space of cone-shaped. At increasing the distance between the gravibody and the given point located on the axis of the cone-shaped, the density of the flux of outgoing ethermats, which pass through the point, is increasing.

Taking in account the abovesaid, the strength of the gravitational field created by the gravibody at a point located at a distance far exceeding the size of the gravibody is twice inversely proportional to the distance between this point and the gravibody, and directly proportional to the mass of supermats of the gravibody:

$$E_g = \frac{M}{L^2} \cdot K_g,$$

where  $E_g$  is the strength of the gravitational field at a given point,  $M$  the mass of supermats of gravibody,  $L$  the distance between the gravibody and a given point, and  $K_g$  the force constant of the gravitational field.

The strength of the gravitational field created by a gravibody at a given point on the surface of the gravibody is defined as follows:

$$E_{g\text{surf}} = M \cdot K_g$$

The strength of the gravitational field created by a dense supergravibody (black holes) at an arbitrary point of the field, is determined with the the fact that in that case the ethermats have completely lost their velocity in the passing through the gravibody. The strength of the gravitational field created by a supergravibody at a point removed from its surface at a distance far exceeding its diameter can be written as

$$E_g = \frac{S}{L^2} \cdot K_g \cdot K,$$

where  $S$  is the area of the projection of the gravibody and  $L$  the distance between the given point and the surface of the gravibody, and  $K$  is the proportionality coefficient of the measurement units.

The strength of the gravitational field of a dense gravibody on its surface equals to the intensity of momenta of the outer ether in the direction towards the center of the gravibody, that is, is equal to the intensity of momenta of the uniform ether outside the gravibody. The strength of the gravitational field on the surface of a dense gravibody is maximal and it is the same for all the dense gravibodies.

$$E_{g \text{ surf}} = E_{\text{in}}.$$

Unit of strength of gravibody must to define in relation to the area, commensurable with the gravibody, but unit of strength of a nuclear field must to define in relation to the area, commensurable with a nucleon.

If to consider, that in the nuclear, electric and magnetic ethereal fields, are acting mainly the ovalmats on the elementary particles and bodies, while in a gravitational field acts mainly the spheremats on the gravibodies, therefore at definition of the strength of these ethereal fields it is necessary to consider only the mats which mainly acts in the given field.

## Conclusions

1. Gravitational field is an ethereal field, formed by the most mobile ethermats which move from the cosmic space into the gravibody at a velocity which over and over again more than the velocity of light by orders of magnitude. When passing through the gravibody, the ethermats collides with supermats and it is decelerating the velocity of motion of the ethermats. As a result, the intensity of momenta of ether in the direction to the gravibody is higher than that in the opposite direction, that represents an gravitational field.