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Assumption Related to Formation of Gravitational Attractive Force

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ABSTRACT

Phenomena of particles attraction towards a particular point are due to the formation of gravitational attractive force. The static friction will raise the temperature/energy in the system to form a rigid solid body. A proof based on conservation of energy in the solid body is presented for the formation of gravitational attraction force.

Keywords: Centre of Gravity, Static Friction, Energy Conservation.

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1. INTRODUCTION

In the beginning of solid formation, a cluster of dust particles is contracted under gravitational pull, and it is said as gravitational attractive force. Such forces lead to static friction with respect to particles interaction, and temperature difference is contributed between them. Finally, a solid is formed, and it have centre of gravity due to inward attractive force. Therefore, to get gravitational attractive force, the static frictions contribute electric charges (q_1, q_2... q_n) between the particles during contraction. At the same time, it also experience magnetic nature (μ_1, μ_2… μ_n) between the particles, which is perpendicular to electric charges. The force formed while particles attracted towards inward of the solid body formation may affect the magnetic nature of particles.

Many research work deals with exhibit of magnetic field while the rotation of body [8, 10] (or) electric field perpendicular to magnetic field [15- 18]. Nowadays, computational analysis was studied for the massive bodies. Such analysis used the Lagrange points for gravitational effect [1, 5]. Similarly, gravitational spin-spin interaction and binary black hole and its rotational were been analyzed theoretically [2]. The gravitational attraction with respect to the temporal motion of the body had been modeled [3]. Gravity at Quantum level as resistance of the mass while interaction was been studied [4, 13].

The present research work is about assuming the suppression of magnetic nature between the particles that experience the gravitational attractive force towards the centre of the solid body. Here, the formation of gravitational attractive force is equal to total energy conserved in system (solid body) which may depend on static friction between the particles that experience the total temperature difference between the particles (or) total energy in the solid body.

2. ASSUMPTION

Consider one suitable example related to formation of solid body (Fig. 1). Consider a wire which is plugged and connected with a bulb. A particular region of the wire is surrounded by human hairs. When the electric power is supplied (or) not supplied; the dust particles are attracted more towards the particular region than other part of wire. Sometimes, it feels like electrostatic precipitation because human hair at the region might act as anode (+ve) ~ Fe^{+} ions [6, 7, 23 - 25].

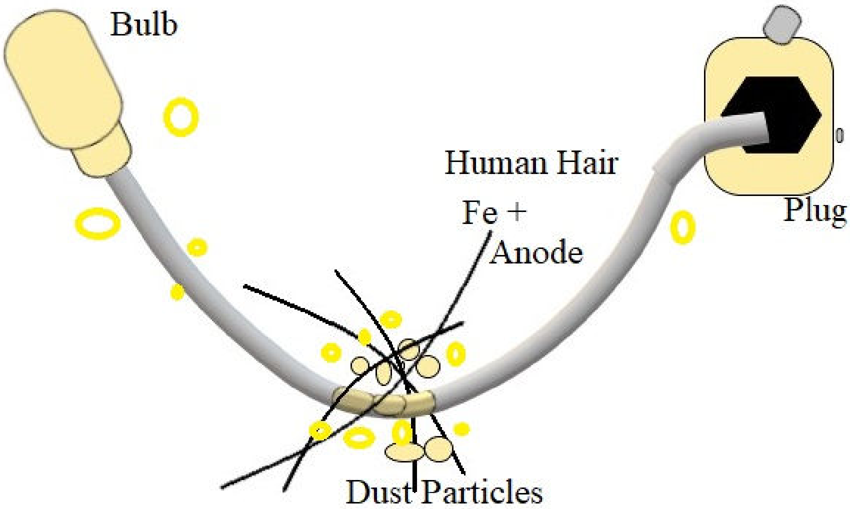

Figure 1. Formation of solid body through dust particles.

The magnetic nature of Fe^+ ions will suppress gravitational pull in the wire. Thus, it could be the centre of gravity for the combination of wire, human hair, and dust particles into one centre point that makes gravity. This phenomenon happens due to formation of gravitational attractive force and suppression of magnetic nature of particles. The resultant weight of all the particles is oriented towards centre by gravitational attractive force [12, 14].

3. CENTRE OF GRAVITY

Fig. 2 shows gravitational attractive force (G_F), the particles q_1, q_2, q_3... q_n and Fe^+ ions in the formation of solid body have masses m_1, m_2, m_3... m_n and that Fe^+ ions (mass) is under the coordinated system, say, (x_1, y_1, z_1), (x_2, y_2, z_2), (x_3, y_3, z_3)… (x_n, y_n, z_n).

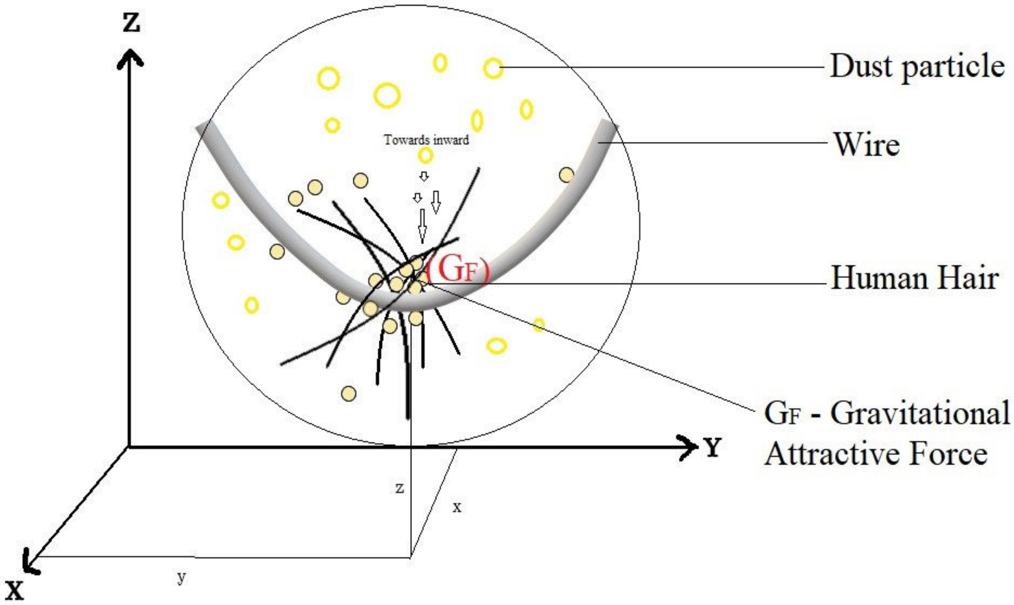

Figure 2. Formation of Gravitational Attractive Force (GF).

Consider the coordinates,

$x_1,\ x_2,\ x_3, \ldots, x_n$ to evaluate $\bar{X}$,

$y_1,\ y_2,\ y_3, \ldots, y_n$ to evaluate $\bar{Y}$, and

$z_1,\ z_2,\ z_3, \ldots, z_n$ to evaluate $\bar{Z}$

Then, the co-ordinates of the centre of gravity for the formation of solid body is

$$\bar{X} = \frac{\sum m_n x_n}{\sum m_n} + Fe^{+}\ ions\ (mass)$$

$$\bar{Y} = \frac{\sum m_n y_n}{\sum m_n} + Fe^{+}\ ions\ (mass)$$

$$\bar{Z} = \frac{\sum m_n z_n}{\sum m_n} + Fe^{+}\ ions\ (mass)$$

Suppose within the system (or) formation of solid body, the centre of gravity is varied based on motion of dust particles in random towards the human hair and wire, as shown in Fig. 2. In such case, Fig. 2 shows (GF) ~ the single element of particle has mass (dm) and its co-ordinates are $\bar{X},\ \bar{Y},\ \bar{Z}$ for $x_1,\ y_1,\ z_1$.

$$\bar{X} = \frac{\int x_1 dm}{F} \times V = \frac{\int x_1 dm}{\int dm}$$

$$\bar{Y} = \frac{\int y_1 dm}{F} \times V = \frac{\int y_1 dm}{\int dm}$$

$$\bar{Z} = \frac{\int z_1 dm}{F} \times V = \frac{\int z_1 dm}{\int dm}$$

Here, V is velocity and $\int dm$ represents the dust particle mass that exhibit gravitational attraction force ($F = \int dm \times V$) extended over all particles inward, towards the particular element of the particle (G_F).

4. STATIC FRICTION

The relative motions of dust particles towards the centre of gravity cause friction; these frictions suppress the magnetic nature between the particles [9, 11]. Hence, the co-efficient of friction is

$$\mu = \frac{F}{R}$$

where,

μ = friction coefficient,

F = limiting the friction (Formation of Gravitational attractive force),

R = Frictional relation between two particles.

We know that, $F = \int dm \times V$ is the formation of gravitational attractive force

Therefore,

$$\mu = \frac{\int dm \times V}{R}$$

This Co-efficient help us to know how much the magnetic nature between the particles is suppressed. In the present case, these static frictions can be considered as electrostatic due to the presence of human hair (Anode Fe^{+} Ions) [6, 7, 21, 22]. The more dust particles stick together along with the human hair rather than other part of the wire, as shown in Fig. 1. Magnetic nature between dust particles is suppressed, and it may increase the temperature (energy) due to friction [19, 20, 26].

5. PROOF FOR THE FORMATION OF GRAVITATIONAL ATTRACTIVE FORCE

Consider Fig. 3 with a system consisting of N dust particles, having $\overline{X} + \overline{Y} + \bar{Z}$ ~ 3N independent co-ordinates. The collection of particle is subjected to (3N − K) co-ordinates. Here, K describes co-ordinates for the motion of the particles towards the system, when the dust particles attain electrostatic charges $q_1, q_2, q_3 \ldots q_k$ corresponding to the generalized co-ordinates of Lagrange.

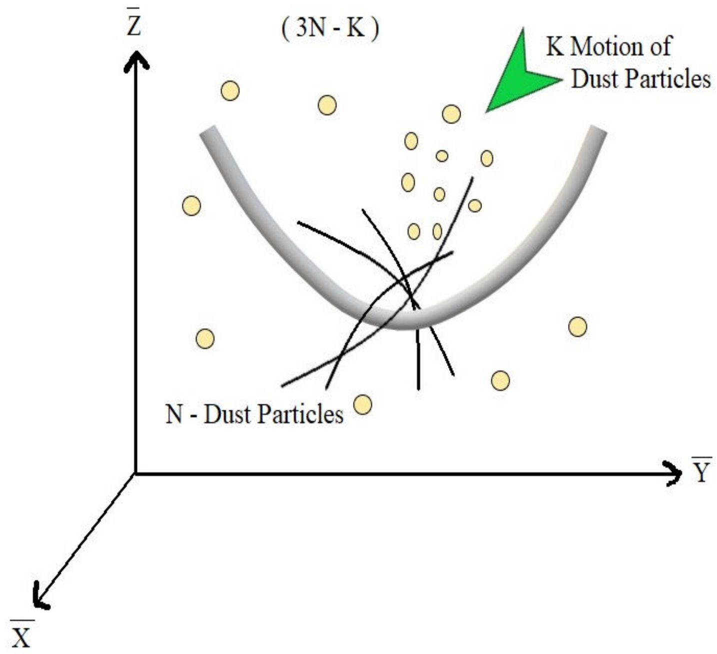

Figure 3. Proof for the formation of gravitational attractive force.

According to Newton Second law,

$$F = m \times a$$

In case of inward attraction of all dust particles, accelerations may be varied with respect to time. Therefore,

$$F_s = \frac{dP_k}{dt}$$

where,

F_s = Electrostatic force, and

P_k = Momentum of particles.

Suppose the net electrostatic force is constant; then $F_s = 0$, $\frac{dP_k}{dt} = 0$. It interprets that the generalized co-ordinates of Lagrange are cyclic, and the Lagrange equation of motion is

$$\frac{dP_k}{dt} = 0 \text{ so that}$$

$$P_k = \frac{\partial \dot{q_k}}{\partial L},$$

$$P_k = constant \text{ , and}$$

$$\frac{d}{dt}\left(\frac{\partial L}{\partial \dot{q_k}}\right) = 0.$$

Assumption Statement: If the total momentum P_k is conserved, then total energy also be conserved because of the static friction rise energy inside the system and then it reduces the temperature (Energy). This must be equal to gravitational attractive force (G_F) toward centre of gravity to form a solid.

The Lagrange L is written as function of q_i and $\dot{q}_i$ for the conservation system of body.

Here $i = 1, 2, 3 \dots k$.

$$L = L\ (q_1, q_2, \dots q_k, \dot{q}_1, \dot{q}_2, \dot{q}_3 \dots \dot{q}_k)$$

$$L \cong L\ (q_k, \dot{q}_k)$$

Dust particles are attracted with respect to the total time derivative in Lagrange co-ordinates

$$\frac{dL}{dt} = \sum_k \frac{\partial L}{\partial q_k} \dot{q_k} + \sum_k \frac{dL}{d\dot{q}_k} \ddot{q_k} + \frac{\partial L}{\partial t} \qquad (1)$$

According to Lagrange's equation,

$$\frac{d}{dt}\left(\frac{\partial L}{\partial \dot{q_k}}\right) - \frac{\partial L}{\partial q_k} = 0$$

$$\frac{\partial L}{\partial q_k} = \frac{d}{dt}\left(\frac{\partial L}{\partial \dot{q_k}}\right) \qquad (2)$$

Use Equation (2) in (1) to get

$$\frac{dL}{dt} = \sum_k \frac{d}{dt}\left(\frac{\partial L}{\partial \dot{q_k}}\right) \dot{q_k} + \sum_k \left(\frac{\partial L}{\partial \dot{q_k}}\right) \ddot{q_k} + \frac{dL}{dt}$$

Using the product rule, the first two terms can be combined

$$\frac{d}{dt}\left(\sum_k \dot{q}_k \frac{\partial L}{\partial \dot{q}_k}\right) = \sum_k \frac{d}{dt}(\dot{q}_k)\frac{\partial L}{\partial \dot{q}_k} + \sum_k \dot{q}_k \frac{d}{dt}\left(\frac{\partial L}{\partial \dot{q}_k}\right)$$

From the Equation (1), it is concluded that $\frac{dL}{dt} = \left(L - \sum_k \dot{q}_k \frac{\partial L}{\partial \dot{q}_k}\right) =$ Constant.

Constant represents the co-ordinates of Lagrange L, which might be equal to the co-ordinates of Hamiltonian H. The equation $\frac{dL}{dt} = Constant$ is true when the Lagrange does not explicitly depend on time. In this situation, the total energy of the solid body (or) system is conserved.

Therefore,

Kinetic Energy (T) + Potential Energy (V) = $L_{\text{Total Energy}}$

Kinetic Energy (T) − Potential Energy (V) = L_{Constant}

Similarly,

Present assumption is related to the formation of gravitational attractive force, which is equal to total energy conserved in the system. The static friction between the dust particles leads to suppression of the magnetic nature between the dust particles in the system while conservation of total energy is maintained. Thus, the dust particles are attracted more towards the particular point of centre. This could be represented as Gravitational Attractive Force (G_F) = Kinetic Energy (T) + Potential Energy (V) = Total Energy.

6. CONCLUSION

The dust particles are attracted towards particular point of centre and this fact is based on the gravitational attractive force to form solid body. The suppression of magnetic nature of the dust particle is created by the static friction; it rises and reduces the temperature energy in the system. The conservation of motion and energy by using Lagrange mechanics show that the particles are attracted towards particular point (centre of gravity). These reasons pave way to the formation of gravitational attractive force.

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