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# Connection Between Gravity and Quantum World

**József Ferencz**

Bolzano Utica 35/a, Budapest 10. Ker., Budapest, Hungary, 1104

*Corresponding author details: József Ferencz; ferenczj@outlook.hu

**ABSTRACT**

Gravity is the most important force in cosmology. A lot of research deals with it, but we only know its perceptible properties. Two basic descriptions of gravity are accepted today. One is based on classical physics based on Newton\'s theory. The other is the theory of gravity described by Einstein. However, another description of gravity is also possible. Gravitation can also be described in other ways using the equations of Kepler, Newton, Coulomb, and Maxwell. Using their equations, it can be deduced that: The magnitude of the gravitational force field is not determined only by mass. It depends on the speed of the mass. It depends on the size of the gravitational field in which the mass moves Newton\'s and Coulomb\'s laws are equivalent. This has already been determined by several researchers. It was also conducted by Constantin Meis. Newton\'s, Coulomb\'s, Maxwell\'s law can be used to determine a new cosmic constant. It can be counted on in the Solar System, but also in the Milky Way. Denote by μ_2 and √ (μ_2) This constant connects the macro world and the micro or quantum world. This constant can also be calculated using Coulomb\'s and Maxwell\'s equations Maxwell\'s and Coulomb\'s equation can be used to determine the resultant of the associated vibrating charges for each mass and celestial body. Coulomb\'s law can also be used to accurately determine the force effect between masses. Even the force effect between celestial bodies can be determined with it. This is exactly the same as the force effect calculated by Newton\'s law. For a mass of 1 kg, we get exactly Cavendish\'s measurement result with Coulomb\'s law. Already in the 20th century, it was suggested that there is a connection between gravity and the electromagnetic field. This has already been conducted by Constantin Meis and Takaaki Musha and B. Ivanov. Gravitational constant can not only be measured, but also calculated in several ways. This has already been determined by several researchers. The gravitational constant can also be calculated using the mass and its speed. But it can also be calculated using the Coulomb constant and μ_2 The gravitational force field for a given mass or celestial body can be calculated using √(μ_2) and the charge of the mass. The speed of a given planet can be calculated using its charge and √ (μ_2) Based on the derivations, gravity is a force field that has an electric force field component. Therefore, it can be the carrier medium of electromagnetic waves. And so is the carrier of light If we assume that the gravitational force field is a very high frequency electromagnetic wave, then we also understand that gravity is unipolar.

***Keywords:*** gravitation; gravitational force field; gravitational constant; cosmic constant, electric charges; Kepler; Newton; Coulomb; Maxwell; macro world; micro world

## INTRODUCTION

The macro world is the result of the micro world and there is a direct connection between the two. This is done through the gravitational force field.

This is the starting point. This is what I want to show below.

The notations I use.

$$\sqrt{\mu_2} = 1.161 \cdot 10^{10} \left[\frac{kg}{As}\right]$$

$K_0$ = Coulomb constant $9 \cdot 10^9 \left[\frac{kgm^3}{A^2s^4}\right]$

G = gravitational constant $6{,}6742 \cdot 10^{-11} \left[\frac{m}{s^2}\right]$

$M_n$ = Sun's mass

$M_f$ = Earth's mass

$Q_n$ = Sun's charge

$Q_f$ = Earth's charge

$R_{nf}$ = Sun Earth distance

$K_a$ = Kepler constant

$$K_{ma} = K_a \cdot 4\pi^2 = 1.327 \cdot 10^{20} \left[\frac{m^3}{s^2}\right]$$

Modified Kepler constant. (1)

$$K_{ma} = R_1 \cdot v_1^2 = R_2 \cdot v_2^2 = R_3 \cdot v_3^2 \quad (2)$$

It is true for any planet around the Sun, but also for satellites.

$$M_n \cdot G = 1.327 \cdot 10^{20} \left[\frac{m^3}{s^2}\right] \text{ Sun is constant.} \quad (3)$$

$$M_n \cdot G = K_{ma} = 1.327 \cdot 10^{20} \left[\frac{m^3}{s^2}\right]$$

$$G = \frac{R \cdot v^2}{M_n} \quad (4)$$

The value of G can be written in two ways.

$$G = \frac{R \cdot v^2}{M_n} \quad (5)$$

R is the orbital radius of the planet, v is the speed of the planet, M is the mass around which the planet orbits.

$$G = \frac{K_0}{\mu_2} \quad (6)$$

$\mu_2$ mass charge proportionality factor.
Proportionality factor between the macro world and the quantum world.

$\mu_2$ It can be calculated using Maxwell's equation and units. [1]

And with Coulomb's constant and Newton's law. [2]

Determination of $\mu_2$ in 3 ways.

***Path I.*** using Maxwell's equation.

$$\varepsilon \cdot \mu = \frac{1}{c^2} \quad (7)$$

$$K_0 = \frac{1}{4\pi\varepsilon} \quad (8)$$

$$\varepsilon = \frac{1}{K_0 4\pi} \quad (9)$$

$K_0$ expressed.

$$K_0 = \frac{\mu}{4\pi} c^2 \quad \left[\frac{kgm^3}{A^2 s^4}\right] \quad (10)$$

Unit of measurement shows that $K_0$ can be calculated in another way.

$$\left[\frac{kg \cdot m}{A^2 s^2} \cdot \frac{m^2}{s^2}\right] \quad (11)$$

The unit of measure of the members of the previous equation is clearly visible.

But we can also write it in a different form based on this.

$$\left[\frac{kg}{A^2 s^2} \cdot \frac{m^3}{s^2}\right] \quad (12)$$

Here, the modified Kepler constant unit of measurement appears as the second term.

Let's name the first member, it is $\mu_1$ for now, as we do not know it.

$$\left[\frac{kg^2}{A^2 s^2} \cdot \frac{m^3}{kgs^2}\right] \quad (13)$$

Now the unit of the gravitational constant G is the second term.

Let's call the first term here $\mu_2$

Write down how many ways we can enter $K_0$.

$$K_0 = \mu_2 \cdot G \quad (14)$$

$$K_0 = \mu_1 K_{má} \quad (15)$$

$$K_0 = \frac{\mu}{4\pi} c^2 \quad (16)$$

Calculate the values of $\mu_1$ and $\mu_2$.

$$\mu_1 = \frac{K_0}{K_{má}} \quad \mu_1 = \frac{9 \cdot 10^9}{1{,}327 \cdot 10^{20}} = 6{,}782 \cdot 10^{-11} \left[\frac{kg}{A^2 s^2}\right] \quad (17)$$

$$\mu_2 = \frac{K_0}{G} \quad \mu_2 = \frac{9 \cdot 10^9}{6{,}6742 \cdot 10^{-11}} = 1{,}348 \cdot 10^{20} \left[\frac{kg^2}{A^2 s^2}\right] \quad (18)$$

Based on the units of measurement, it can be seen that $\mu_1$ and $\mu_2$ are divisible by each other and the expected result will be in mass units.

$$\frac{\mu_2}{\mu_1} = \frac{1{,}348 \cdot 10^{20}}{6{,}782 \cdot 10^{-11}} = 1{,}987 \cdot 10^{30} \text{ kg} \quad (19)$$

And this is exactly the mass of the sun. Knowing this, we can now determine the hitherto unknown $Q^2$ value in the unit $\mu_2$ $\mu_1$. Based on the above

$$\mu_1 = \frac{M_n}{Q^2} \text{ így a} \quad (21) \quad Q^2 = \frac{M_n}{\mu_1} \quad (20)$$

$$Q^2 = \frac{1{,}987 \cdot 10^{30}}{6{,}782 \cdot 10^{-11}} = 2.929 \cdot 10^{40} [A^2 s^2] \text{ És ebből a}$$

$$Q = 1{,}711 \cdot 10^{20} [As]$$

Let's check this result for $\mu_2$ as well.

$$\mu_2 = \frac{M_n^2}{Q^2} \quad 1{,}348 \cdot 10^{20} = \frac{1{,}987^2 10^{60}}{2{,}929 \cdot 10^{40}} \quad (21)$$

The result is the same as the value calculated from the constants.

$$\mu_2 = \frac{K_0}{G} \quad \text{So} \quad (18)$$

$$\frac{K_0}{G} = \frac{M_n^2}{Q^2} = \mu_2 \quad (22)$$

Since $Q^2$ was calculated with the mass of the Sun, it is therefore an index element $Q_n$.

$$\frac{K_0}{G} = \frac{M_n^2}{Q_n^2} = \mu_2 \quad (23)$$

The value of $\sqrt{\mu_2}$ has already been determined by Takaaki Musha from Japan and B. Ivanov from Bulgaria. They indicated that there is a connection between gravity and the electromagnetic field [3].

$$\sqrt{\mu_2} = 1.161 \cdot 10^{10} \left[\frac{kg}{As}\right] \quad (24)$$

***Path II.*** út. $\mu_2$ kiszámítására.

Combine Coulomb's and Newton's laws and solve the equation. Coulomb's law and Newton's law are the same.[22]

$$K_0 \frac{Q_n Q_f}{R_{nf}^2} = G \cdot \frac{M_n M_f}{R_{nf}^2}. \quad (25)$$

$$\frac{K_0}{G} = \frac{M_n M_f}{Q_n Q_f} = \mu_2 \qquad (26)$$

$$\frac{K_0}{G} = \frac{M_n^2}{Q_n^2} = \mu_2 \qquad (23)$$

$$G = \frac{K_0}{\mu_2} \qquad (18)$$

$$G = \frac{1}{4\pi\varepsilon_0}\frac{1}{\mu_2} \qquad (27)$$

$$\frac{M_n^2}{Q_n^2} = \frac{M_n M_f}{Q_n Q_f} \qquad (28)$$

$$\frac{M_n}{Q_n} = \frac{M_f}{Q_f} = \sqrt{\mu_2} \qquad (29)$$

It can be seen that $\sqrt{\mu_2}$ is a mass charge proportionality factor. It can be used for any planet.

***Path III.***út $\mu_2$ kiszámítására.

Let's see how $\mu_2$ connects classical physics with quantum physics.

For this, we use the equation of Constantin Meis

$$G = \frac{l_P^2}{4\pi\varepsilon_0\mu_0 e\xi} \quad [21].$$

This equation can also be written in the following form.

$$G = K_0 \frac{l_P^2}{\mu_0 \cdot e \cdot \xi} \qquad (30)$$

$$G = \frac{1}{4\pi\varepsilon_0}\frac{1}{\mu_2} \qquad (27)$$

$$\frac{1}{\mu_2} = \frac{l_P^2}{\mu_0 \cdot e \cdot \xi} \qquad (31)$$

$$\frac{1}{\mu_2} = 0{,}741 \cdot 10^{-20} \left[\frac{A^2 s^2}{kg^2}\right]$$

$$\frac{1}{\mu_2} = \frac{1{,}616^2 \cdot 10^{-70}}{12{,}566 \cdot 10^{-7} \cdot 1{,}602 \cdot 10^{-19} \cdot 1.747 \cdot 10^{-25}} = 0{,}742 \cdot 10^{-20} \left[\frac{A^2 s^2}{kg^2}\right]$$

$$\mu_2 = 1{,}3477 \cdot 10^{20} \left[\frac{kg^2}{A^2 s^2}\right]$$

$$\sqrt{\mu_2} = 1.161 \cdot 10^{10} \left[\frac{kg}{As}\right]$$

$\sqrt{\mu_2}$ creates a link between macro physics and the micro world.

Let's see if we can use $\sqrt{\mu_2}$ in our calculations. First, let's determine the Earth's charge.

$$\frac{M_f}{\sqrt{\mu_2}} = Q_f \quad \frac{5{,}98 \cdot 10^{24}}{1{,}161 \cdot 10^{10}} = 5{,}1507 \cdot 10^{14} [As] \qquad (32)$$

Let's put the charge of the Sun here, we have already calculated it,

$$Q_n = 1{,}711 \cdot 10^{20} [As].$$

Calculate the force between the Sun and the Earth, using Newton's and Coulomb's laws.

With Newton's law.

$$F_N = G \cdot \frac{M_n M_f}{R_{nf}^2}$$

$$F_N = 6{,}67424 \cdot 10^{-11} \frac{1{,}99 \cdot 10^{30} \cdot 5{,}98 \cdot 10^{24}}{1{,}495^2 \cdot 10^{22}} = 3{,}553 \cdot 10^{22} \left[\frac{kgm}{s^2}\right] \qquad (33)$$

With Coulomb's law.

$$F_C = K_0 \frac{Q_n Q_f}{R_{nf}^2} \quad \backslash F_C = 9 \cdot 10^9 \frac{1{,}712 \cdot 10^{20} 5{,}149 \cdot 10^{14}}{1{,}495^2 10^{22}} = 3{,}548 \cdot 10^{22} \left[\frac{kgm}{s^2}\right] \qquad (34)$$

In the case of both calculations, we obtained the same result. The same result is obtained when calculating for the Moon and other planets.

Cavendish's experiment can also be verified using charges.

$$\frac{Q_f}{M_f} = \frac{5{,}149 \cdot 10^{14}}{5{,}98 \cdot 10^{24}} = 8{,}61 \cdot 10^{-11} \left[\frac{As}{kg}\right] \qquad (35)$$

$$F_C = 9 \cdot 10^9 \frac{8{,}61 \cdot 10^{-11} \cdot 8{,}61 \cdot 10^{-11}}{1^2} = 6{,}672 \cdot 10^{-11} [N]$$

This corresponds to the value measured by Cavendish

Let's see where else we can use the $\sqrt{\mu_2}$.

We can also calculate the force field of the electric field belonging to the charges. If we know this, then we can determine the value of the associated gravitational field.

The charge of the Sun is already known:

$$Q_N = 1{,}711 \cdot 10^{20} [As]$$

Sun's equatorial radius: $6{,}95 \cdot 10^8$ m.

Based on Coulomb's law, if I assume it is point-like.

The electric field on the surface of the Sun.

$$E = K_0 \frac{Q_N}{R_N^2} \quad 9 \cdot 10^9 \frac{1{,}711 \cdot 10^{20}}{6.95^2 \cdot 10^{16}} = 3{,}188 \cdot 10^{12} \left[\frac{kgm}{As^3}\right] \qquad (36)$$

$E \left[\frac{kgm}{As^3}\right]$ $g \left[\frac{m}{s^2}\right]$ $\sqrt{\mu_2} \left[\frac{kg}{As}\right]$ based on the units of measurement, it can be seen that

$$g = \frac{E}{\sqrt{\mu_2}} = \frac{3{,}188 \cdot 10^{12}}{1{,}161 \cdot 10^{10}} = 274 \left[\frac{m}{s^2}\right] \qquad (37)$$

And this is exactly the same as the gravitational field force on the surface of the Sun.

Let's look at the surface of the Earth as well.

The electric force field.

$$E = K_0 \frac{Q_f}{R_F^2} \quad 9 \cdot 10^9 \frac{5{,}149 \cdot 10^{14}}{6{,}378^2 \cdot 10^{12}} = 1{,}139 \cdot 10^{11} \left[\frac{kgm}{As^3}\right] \qquad (36)$$

$$g = \frac{E}{\sqrt{\mu_2}} \quad \frac{1{,}139 \cdot 10^{11}}{1{,}161 \cdot 10^{10}} = 9{,}81 \left[\frac{m}{s^2}\right] \qquad (37)$$

This is the gravitational field force that can be measured on the Earth's surface. This method gives correct results for any planet.

Let's see what else we can calculate using $\sqrt{\mu_2}$. With the help of charges, we can also calculate voltage over known distances. Let's calculate the voltage associated with charging the Sun at the Sun-Earth distance.

$U_{nf}$ voltage at distance from Sun to Earth.

$R_{nf}$ Sun Earth distance

Unit of voltage $\left[\frac{kgm^2}{As^3}\right]$

$$U_{nf} = K_0 \frac{Q_N}{R_{nf}} \; 9 \cdot 10^9 \frac{1{,}711 \cdot 10^{20}}{1{,}495 \cdot 10^{11}} = 1{,}03 \cdot 10^{19} \left[\frac{kgm^2}{As^3}\right] \tag{38}$$

Again, units of measure help.

$U \left[\frac{kgm^2}{As^3}\right] \quad v^2 \left[\frac{m^2}{s^2}\right] \quad \sqrt{\mu_2} \left[\frac{kg}{As}\right]$

It can be seen that U is the product of $\sqrt{\mu_2}$ and the square of the speed.Let's see what speed we get at the Sun-Earth distance.

$$v^2 = \frac{U}{\sqrt{\mu_2}} = \frac{1{,}0299 \cdot 10^{19}}{1{,}161 \cdot 10^{10}} = 8{,}87 \cdot 10^8 \left[\frac{m^2}{s^2}\right] \tag{39}$$

After calculating the square root. $v = 2{,}978 \cdot 10^4 \left[\frac{m}{s}\right]$

This is the Earth's average orbital speed around the Sun. Let's do the calculation for the Earth's surface as well. Where we have already calculated the electric field.

$$U = 1.139 \cdot 10^{11} \cdot 6{,}378 \cdot 10^6 = 7{,}264 \cdot 10^{17} \left[\frac{kgm^2}{As^3}\right]$$

$$v^2 = \frac{U}{\sqrt{\mu_2}} = \frac{7{,}264 \cdot 10^{17}}{1{,}161 \cdot 10^{10}} = 6{,}257 \cdot 10^7 \left[\frac{m^2}{s^2}\right] \tag{39}$$

$v = 7{,}91 \cdot 10^3 \left[\frac{m}{s}\right]$ this is the 1st cosmic speed at the Earth's surface.

The results of all calculations are the same as those accepted today. Many more examples can be written.

The calculations prove that there is a connection between the gravitational force field and the electric force field. The question is how to solve the problem of seemingly static charges?

Let's look at the figure below.

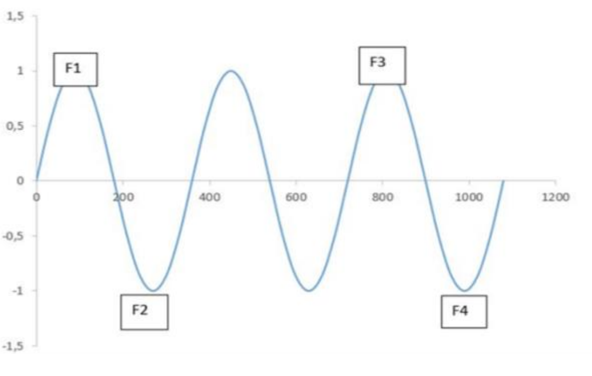


**FIGURE 1:** Regular sine wave (EM wave).

The figure 1. shows a regular sine wave, which can also be considered an EM wave. Consider that the EM wave is a continuously traveling wave. Think of this as a wave from a radio transmitter. The measuring points F1, F2, F3, F4 in the figure. Let's see what the measuring points detect if it is a continuously moving wave. The radio transmitter is at point 0. We have now only included the road on the x-axis. Since the transmission is continuous, the signal is measured at all 4 measuring points at a selected moment of time t1. Which means that at time t1 there are both positive and negative half-periods along the x-axis.

In the EM wave at the same time. The consequence of this is that the attractive force effect between the two force fields occurs here as well. This is true for the entire length of the EM wave. This must be perceptible This is true for all continuous waves. This means that positive and negative fields are constantly present between the transmitter and the receiver. If we imagine the transmitter as spherical, then an EM wave looks like a spherical capacitor, where the polarity of the charge changes with a very high frequency. This capacitor keeps increasing as the waves move away from the transmitter. Outside, the electric field is neutral. The force effect is valid within the wave and between the transmitter and receiver.

The effect of electric force fields is outwardly neutral. If it is correct to assume that a gravitational force field is a very high frequency EM wave, then I can consider the Sun, the Earth, or any planet as a transmitter and a receiver. Even in the gravitational force field, we only perceive the force effect between the masses. Gravity also always acts against the force that created it. This can be centripetal acceleration during a circular orbit. But it can also accelerate in a straight line. We can calculate the force using Newton's law of force and Coulomb's law, which gives the same results. In the case of Coulomb's law, we know that it can only be used here if we know that at any instant of time we measure both force fields are present at the same time, but are neutral outside. Actually, it's like a big capacitor. Which has a high voltage at both ends, but changes with a high frequency. Based on this, it can be understood that the inertia of a moving mass is measured in the gravitational force field. The amount of charge that we calculate for a given planet is not the total charge of that planet. This amount of charge would ensure the force effect. But this can only be the result of all the vibrating charges of the crowd.

Gravity has another important property. Gravity is velocity dependent. This is proven by the fact that we can also calculate the speed of planets with the help of $\sqrt{\mu_2}$.

Kepler's 3rd law also proves this.

Kepler's 3rd law.

$\frac{T_1^2}{T_2^2} = \frac{R_1^3}{R_2^3}$ [2]

We can also write this in the following form.

$$K_{ma} = R_1 \cdot v_1^2 = R_2 \cdot v_2^2 = R_3 \cdot v_3^2 \quad (2)$$

It is the product of the minor or major axis of the planets and the square of the associated speed. It is always constant.

This is true for all planets. This is the modified Kepler constant. The value of this. $1{,}327 \cdot 10^{20} \frac{m^3}{s^2}$ This is true for all planetary orbits.

This is equal to the constant value of the Sun.

$$M_n \cdot G = 1{,}327 \cdot 10^{20} \frac{m^3}{s^2} \quad (4)$$

That's why we can write.

$$R_1 \cdot v_1^2 = R_2 \cdot v_2^2 = M_n \cdot G. \quad (40)$$

Sorting out the formula, the gravitational constant G becomes the following.

$$G = \frac{R_1 \cdot v_1^2}{M_n} \quad (5)$$

This is true for any planetary orbit. But it can also be derived from Newton's law. It also shows that the value of the gravitational constant G varies.

It depends on the radius of the planet's orbit. From the speed of the planet around the Sun. It depends on the mass of the Sun. Since these variables only change very slowly, we consider the gravitational constant to be constant. Let's look at some examples of this. With the data of the Earth and the Sun.

$$G = \frac{R_1 \cdot v_1^2}{M_n} \quad G = \frac{1{,}4959 \cdot 10^{11} \cdot 29{,}789^2 \cdot 10^6}{1{,}989 \cdot 10^{30}} = 6{,}674 \frac{m^3}{kg \cdot s^2} \quad (5)$$

et's calculate with the data of Venus and Sun.

$$G = \frac{1{,}082 \cdot 10^{11} \cdot 35.03^2 \cdot 10^6}{1.989 \cdot 10^{30}} = 6{,}674 \frac{m^3}{kg \cdot s^2}$$

It can also be checked with data from the Moon. The central mass of the Milky Way system can also be determined in this way.

Let's write the formula for G in Newton's law.

g= gravity on Earth. $g = \frac{R_n \cdot v_f^2}{M_n} \cdot \frac{m_f}{r_f^2}$ (41)

We check with Earth's mass and velocity.

$$9.8114 \frac{m}{s^2} = \frac{1.495978 \cdot 10^{11} \cdot 29.789^2 \cdot 10^6}{1.989 \cdot 10^{30}} \cdot \frac{5.98 \cdot 10^{24}}{6.3782^2 \cdot 10^{12}}$$

The result of the calculation is a Gravity that can be measured on Earth. It gives correct result for any planet or moon.

$$g = \frac{R_n \cdot v_f^2}{M_n} \cdot \frac{m_f}{r_f^2} \quad (41)$$

The formula shows that gravity does not only depend on mass. It can be seen that it depends: (1) from the speed of the planet, (2) from the mass of the Sun that orbits it, (3) from the radius of circulation. So gravity is not only determined by mass.

$$g = \frac{R_n \cdot v_f^2}{M_n} \cdot \frac{m_f}{r_f^2} \quad (41)$$

This formula also gives the energy of Earth's gravity $v_f^2 \cdot m_f$.

Based on what has been described, we can see that gravity can be described from both the macro world and the quantum world. But it can also be seen that G is a function of at least 3 factors. 2 of these also change while the Earth moves in its orbit around the Sun. The measurements are confused by how fast the Earth is moving and how far it is from the Sun. That's why we can't measure it exactly.

## SUMMARY

1) Gravity requires the movement of the mass, so it is induced by movement.
2) One of the components of gravity is the changing electric force field.
3) Gravity is a very high frequency EM wave. That is why gravity can be the carrier of light and EM waves.
4) Gravity, like all waves, can reinforce or cancel each other. /tidal phenomenon/
   /The problem of black holes/. Where gravitational waves cancel each other out, light does not propagate.
5) If gravity is a high-frequency wave, it can only have one pole.
6) It also helps to understand the two-slit experiments if we know that they can only be performed in a gravitational field.
7) We understand that the crowd has a measure of helplessness. Because I move a mass with a gravitational force field in another gravitational force field and they interact.

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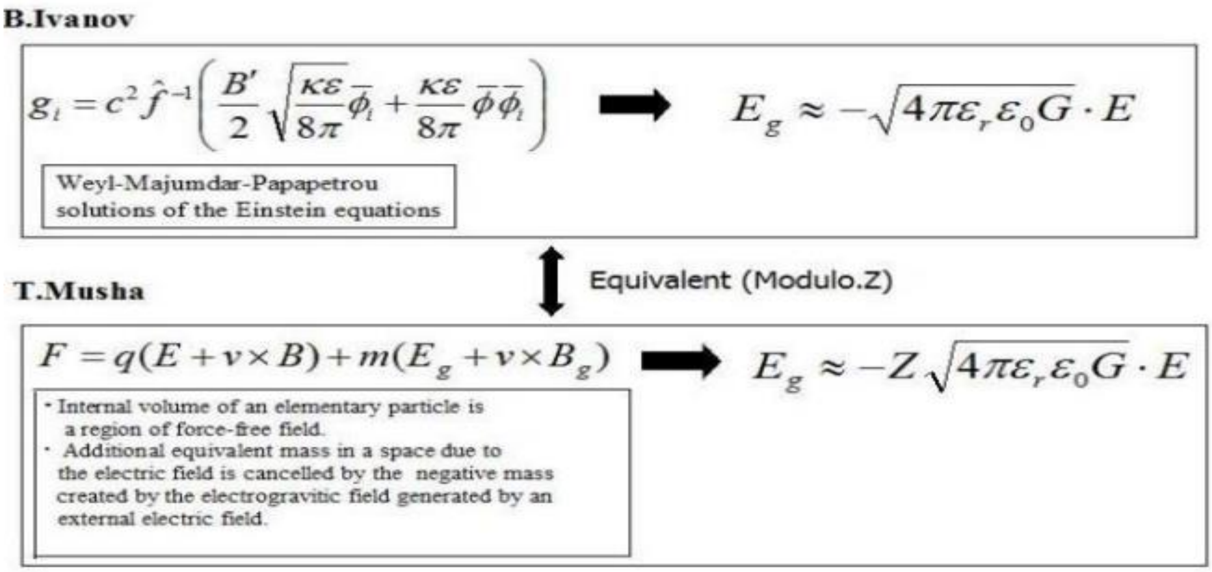


Summary of electrogravitic formula given by Musha and Ivanov.

Kepler's, Newton's, Coulomb's and laws are educational material in high school.

Maxwell's law is a teaching material in colleges.