ЗАГАЛЬНІ ПИТАННЯ МЕТРОЛОГІЇ, ВИМІРЮВАЛЬНОЇ ТЕХНІКИ І ТЕХНОЛОГІЙ

УДК 001.5:53.02:53.05

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PLANCK UNIVERSAL PROPORTIONS. GRAVITATIONAL - ELECTROMAGNETIC RESONANCE

For every object of the Universe, which is endowed with a mass ratio of Planck's constant – mass, length and time equal to the corresponding ratio of the mass of the object and its characteristic spatial and temporal parameters – the length of a gravitational wave and the delay time.
Keywords: proportion of Planck's constant, the gravitational potential, gravitational-electromagnetic resonance.

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УНИВЕРСАЛЬНЫЕ ПРОПОРЦИИ ПЛАНКА. ГРАВИТАЦИОННО-ЭЛЕКТРОМАГНИТНЫЙ РЕЗОНАНС

Для любого наделенного массой объекта Вселенной отношения констант массы, длины и времени Планка равны соответствующим отношениям массы этого объекта и его характеристических пространственных и временных параметров – длины гравитационной волны и времени задержки.
Ключевые слова: пропорции констант Планка, гравитационный потенциал, гравитационно-электромагнитный резонанс.

1. Introduction

The proportions of the Planck constant – mass, length and time sets universal limits of space, energy and temporal parameters of all objects in the Universe that are endowed with mass.

The maximum possible transmission rate of physical interaction in the Universe – the speed of light depends only on the spatial and energy parameters of the Universe and is independent of its temporal characteristics. Gravitational and electromagnetic waves can enter into resonance.

2. Planck restrictions

Module of gravitational potential $|\varphi|$ of spherical body with mass m is equal to [1]:

$$|\varphi| = \frac{Gm}{R}, \tag{1}$$

where R – is the distance from the body, G – is the gravitational constant.

It is known that the gravitational potential has the dimension of square of the velocity. Then, if c – is the speed of light, then for the limiting case and some value of $R = S$ is true:

$$c^2 = \frac{Gm}{S}, \tag{2}$$

or

$$\frac{c^2}{G} = \frac{m}{S},$$

or

$$\frac{m_p}{l_p} = \frac{m}{S}, \tag{3}$$

where m_p and l_p – is the mass and length of the Planck.

From (3) follows:

$$S = \frac{l_p}{m_p} m, \tag{4}$$

and

$$m = \frac{m_p}{l_p} S. \tag{5}$$

This means, that if $F_p = m_p a_p$ – is the Planck power, where a_p – is the Planck acceleration:

$$a_p = \frac{l_p}{t_p^2},$$

where t_p – is the Planck time, then the total energy of the body E with mass m is equal to:

$$E = mc^2 = \frac{m_p}{l_p} Sc^2 = F_p S, \tag{6}$$

where $F_p S$ – is the work, which is performed by the gravitational field of the body with mass m on the deformation of space, what is more, S – the radius of curvature of the deformed space by the gravitational field of the body with mass m, or actually – it is the length of a gravitational wave of the body's gravitational field with mass m. The length of a gravitational wave is half the Schwarzschild radius [1].

If the observable Universe has a radius R_0 and mass M, based on its model of a mathematical pendulum, the following is true:

$$c^2 = G\frac{M}{R_0} \tag{7}$$

or

$$\frac{m_p}{l_p} = \frac{M}{R_0}. \tag{8}$$

This means that the observable Universe is limited, and R_0 – is the length its gravitational waves.

From (2, 3, 7, 8) follows, that the maximum possible transmission speed of physical interaction – is the speed of light, which clearly depends only on its own spatial and energy characteristics of the observable Universe, and is independent of its temporal characteristics.

In the conditionally limited space, where there is no mass (energy), the time factor does not exist. At occurrence of mass (energy) in the space, the time factor appears, as its integral characteristic of spatial and energy parameters. In this case, time parameter, which uniquely characterizes both observable Universe and its separate object with mass m, will be assumed as the delay t_d in distributing the light signal at a distance equal to the length of a gravitational wave, respectively, of the Universe:

$$t_{dU} = \frac{R_0}{c} = \frac{t_p}{l_p} R_0, \tag{9}$$

and body with mass m with a length of the gravitational wave S, that is equal:

$$t_{dm} = \frac{S}{c} = \frac{t_p}{l_p} S \tag{10}$$

or

$$S = \frac{l_p}{t_p} t_{dm}. \tag{11}$$

Taking into account (4, 5), the equation (10, 11) has the following form:

$$t_{dm} = \frac{t_p}{m_p} m \tag{12}$$

and

$$m = \frac{m_p}{t_p} t_{dm}. \tag{13}$$

If $E_p = m_p c^2$ – is Planck energy, and $h_e = \frac{E_p}{t_p}$ – is the Planck energy quantum, then taking into account (6, 10-13), the total energy of the body E with mass m is equal to:

$$E = mc^2 = F_p S = h_e t_{dm}. \tag{14}$$

From (14) follows that each separate characteristic of the body - mass, the length of a gravitational wave, and the time delay, clearly determine its total energy.

Let's call expressions (4, 5), (10, 11) and (12, 13) as the Planck proportions. They are universal mutual restrictions for all bodies of the observable Universe, which have mass m, gravity wave length S and time delay t_{dm}.

For two bodies with mass m_1 and m_2, the gravitational wave length S_1 and S_2, time delay t_{d1} and t_{d2}, at a distance R from each other, the law of Universal gravitation is:

$$F = G\frac{m_1 m_2}{R^2} = F_p \frac{S_1 S_2}{R^2} = F_p c^2 \frac{t_{d1} t_{d2}}{R^2}. \quad (15)$$

Conclusion: universal proportions – Planck restrictions clearly define the main spatial and energy parameters of any object of the Universe, which have mass.

3. Gravitational - electromagnetic resonance

On the basis of data on mass of objects [2] and the formulas (4, 5), (10, 11) and (12, 13) it is made calculations of the gravitational wave length and frequency, respectively:

Name	Mass, kg	Gravitational wave length, m	Frequency, GHz
Earth	5.9722 x 10^{24}	0.00443474	67.6
Moon	7.3477 x 10^{22}	0.000054547302	5495.94
Venus	4.8673 x 10^{24}	0.0036143131	82.95
Mars	6.4169 x 10^{23}	0.00047451718	631.78
Jupiter	1.8981 x 10^{27}	1.40948454472	0.2127
Saturn	5.6832 x 10^{26}	0.42201429314	0.7104
Sun	1.989 x 10^{30}	1477.036	2,0297 x 10^{-4}

The presence of gravitational-electromagnetic resonance of the Earth was tested by practical consideration on the experimental measuring system on the base of Ukrainian State Enterprise "Research Institute "Orion". Experimental conditions: air temperature 25 ° C, relative humidity 35%, atmospheric pressure 755 mm Hg. Art., the height of the measuring system is 15 m above ground level. These conditions do not require the introduction of amendments to the measure.

Experimental measuring system consists of:

- MS signal generator in the frequency range 57 GHz - 77 GHz and output power up to 10 mW;
- Measurement channel consisting of: a waveguide; calibrated cylindrical cavity with a graduated movable rod stimulated by wave H011; attenuator;
- Oscilloscope in the frequency range 57 GHz - 77 GHz, for visual display and control of signals from the output of the generator and the output of the measuring channel;
- Power meter of signal K M3-75v with frequency range 57 GHz - 77 GHz.

A block diagram of the measurement setup is shown in Figure 1.

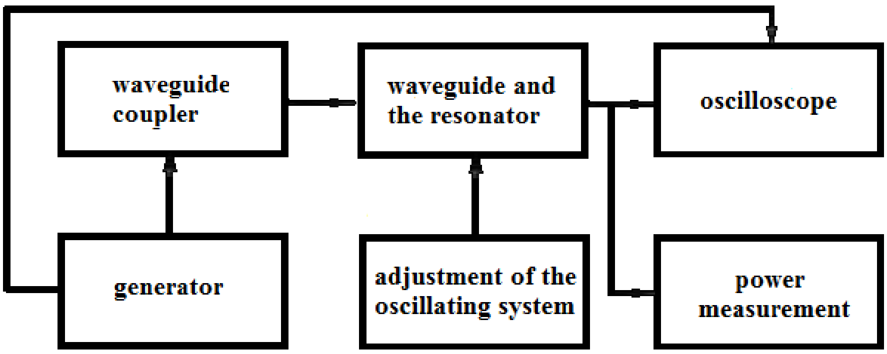

Figure 1 – Flow diagram of the measurement setup

It functions as a resonant wave meter [3, 4] with the setting of the resonance frequency at a minimum output power of the measuring channel.

The experiment algorithm is the following: measurements were carried out in the frequency range of 65.2 GHz to 68.8 GHz with a step of 0.6 GHz, 0.1 GHz, 0.01 GHz at several fixed values of the power levels of the output signal from the signal generator MS, namely: 3.62 mW; 4.73 mW; 4.5 mW, 5.04 mW, 6.1 mW. Signal with strictly defined power and frequency from output of the frequency generator is supplied to a measuring channel (waveguide cavity). At the same time for the visual control of the presence of a resonance, signal from the output of the generator and the measuring channel is supplied to a multi-channel oscilloscope. With the help of the graduated movable rod in the resonator with a waveguide measuring channel resonance is established. Presence of resonance is registered with an oscilloscope and power meter at a minimum power of the output signal of the measuring channel. Further by the previously set fixed value of the power at a predetermined pitch the frequency of the signal changed at the output of the generator frequency, and in the resonator with the waveguide via a graduated rod resonance was mounted and the measurements were repeated. At the end of measurements in a given frequency range signal power level at the output of the generator frequency changes and re-measurement of minimums signal power is carried out at the moment of resonance in the resonator with the waveguide at the output of the measuring channel. To prevent accidental emissions of experimental data, measurements were carried out repeatedly, and the data was then averaged.

The graphs were made according to experimental data: Figure 2 – Figure 6.

Analysis of the graphs shows the presence of minimum-minimorum power of signals at the output of measuring channel at the frequency 67.6 GHz for all fixed power levels of the signal generator MS, which confirm the presence of gravitational-electromagnetic resonance.

On the basis of expressions (4, 5), (10, 11) and (12, 13), it can be argued that the emission spectrum of any astronomical object will contain a component, due to its gravitational-wave modulation. Since the mass of an object and its gravitational wave are connected by unique dependence, then by allocating this component, it can be clearly determined the mass of the object. This means that in astronomy, it can appear an accurate tool for determining the mass of distant objects of the Universe. Spectra of signals from objects, that reflect this signal (but not emit), for example planets, - will contain two modulating gravitational waves. For the solar system - it is gravitational wave of the Sun and the gravitational wave of own planet.

Gravitational-electromagnetic resonance confirms the possibility of levitation. Gravitational-electromagnetic resonance allows you to create new sources of energy.

Conclusion: open the law of nature - Planck universal proportions. On the basis of this law opened a new property of matter - gravitational-electromagnetic resonance.

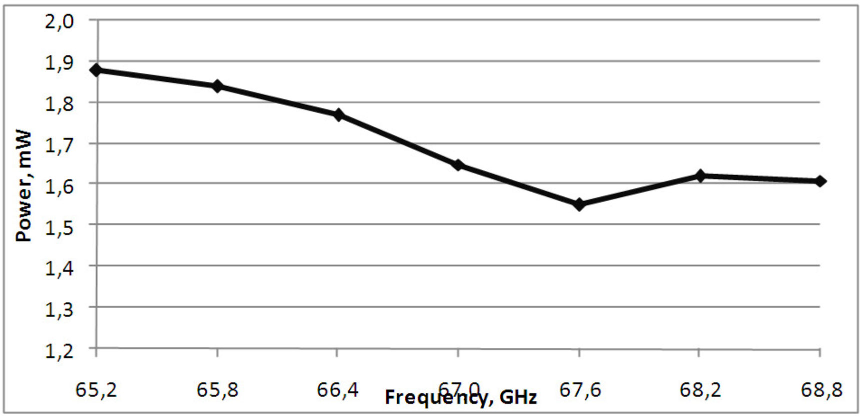

Figure 2 – Graph of dependency of signal power on frequency in the frequency range from 65.2 GHz to 68.8 GHz with a step of 0.6 GHz at the output of the measuring channel. The signal power at the output of the generator is 3,62 mW.

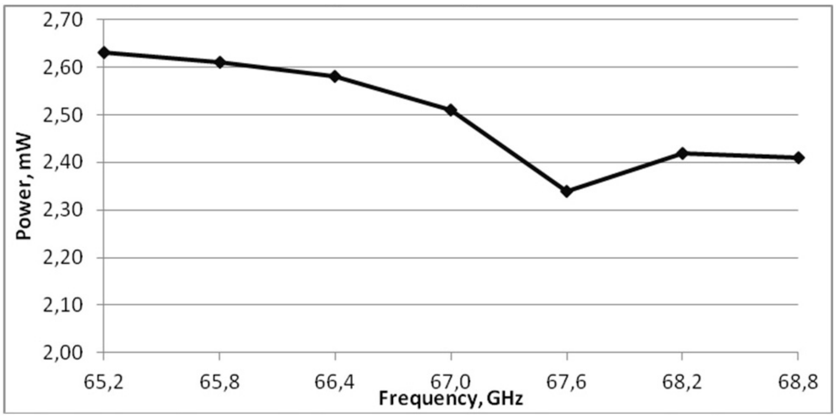

Figure 3 – Graph of dependency of signal power on frequency in the frequency range from 65.2 GHz to 68.8 GHz with a step of 0.6 GHz at the output of the measuring channel. The signal power at the output of the generator is 4,73 mW.

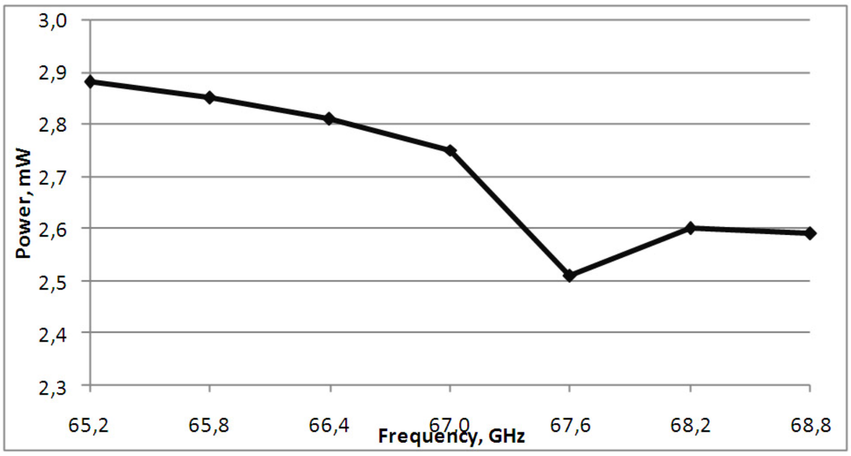

Figure 4 – Graph of dependency of signal power on frequency in the frequency range from 65.2 GHz to 68.8 GHz with a step of 0.6 GHz at the output of the measuring channel. The signal power at the output of the generator is 5,04 mW.

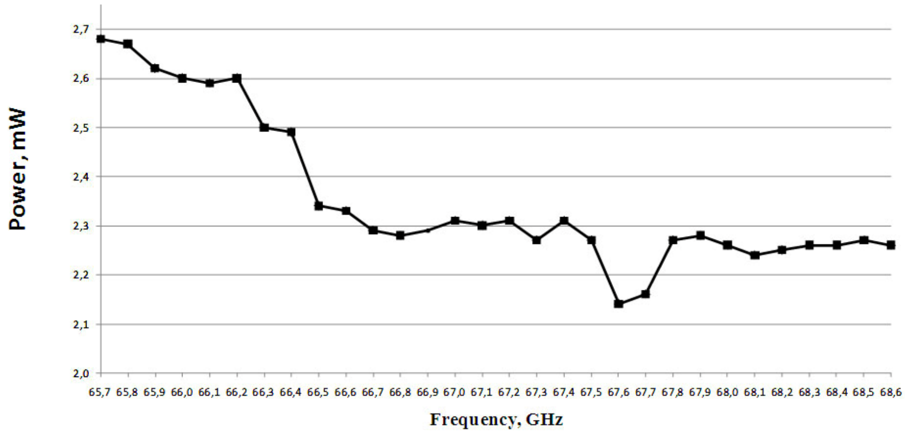

Figure 5 – Graph of dependency of signal power on frequency in the frequency range from 65.7 GHz to 68.6 GHz with 0.1 GHz at the output of the measuring channel. The signal power at the output of the generator is 4,5 mW.

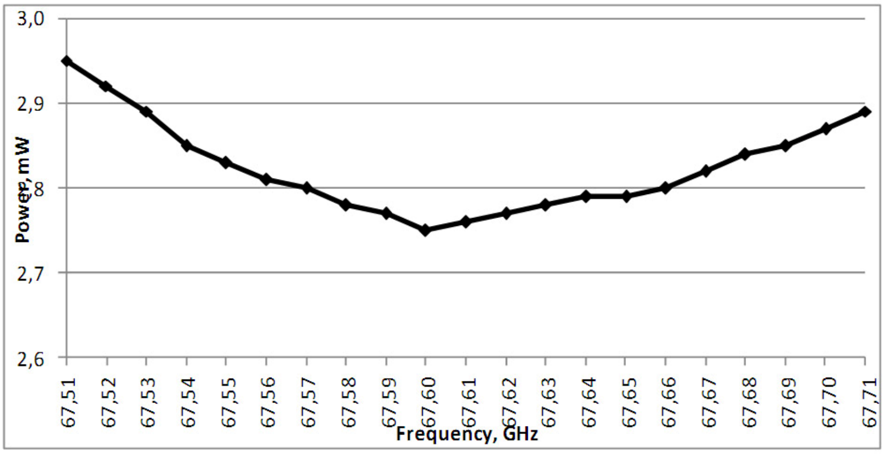

Figure 6 – Graph of dependency of signal power on frequency in the frequency range from 67.71 GHz to 67,51 GHz with a step of 0.01 GHz at the output of the measuring channel. The signal power at the output of the generator is 6,1 mW.

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Рецензія/Peer review : 8.9.2015 р. Надрукована/Printed :14.10.2015 р.