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THE GRAVITATIONAL-ELECTROMAGNETIC RESONANSE OF THE SUN IN THE LOW-FREQUENCY OF RADIO SPECTRUM OF THE JUPITER

Gravitational-electromagnetic resonance of the Sun at frequency 202.97 kHz is found in the low-frequency spectrum of the radio emission of the Earth, Saturn, Jupiter. Gravitational-electromagnetic resonance of the Sun may be one of the secondary sources of radio emission from planets that have an atmosphere. This resonance is detected not only at the fundamental frequency of 202.97 kHz, but at higher harmonics. The spectrum of the solar wind is modulated gravitational-electromagnetic resonance of the Sun.

Keywords: gravitational-electromagnetic resonance of the Sun, spectrum of the radio emission, universal Planck proportions.

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ГРАВИТАЦИОННО-ЭЛЕКТРОМАГНИТНЫЙ РЕЗОНАНС СОЛНЦА В НИЗКОЧАСТОТНОМ СПЕКТРЕ РАДИОИЗЛУЧЕНИЯ ЮПИТЕРА

Гравитационно-электромагнитный резонанс Солнца на частоте 202.97 кГц обнаружен в низкочастотном спектре радиоизлучения Земли, Сатурна, Юпитера. Гравитационно-электромагнитный резонанс Солнца может быть одним из вторичных источников радиоизлучения планет, которые обладают атмосферой. Этот резонанс обнаружен не только на основной частоте 202.97 кГц, но и на более высоких гармониках. Спектр солнечного ветра промодулирован гравитационно-электромагнитным резонансом Солнца.

Ключевые слова: гравитационно-электромагнитный резонанс Солнца, спектр радиоизлучения, универсальные пропорции Планка.

1. Introduction

In [1,2,3,4,5,6,7] it is shown, that the auroral radio emission of the planets with an atmosphere is closely connected with the emergence of magnetospheric storms (during magnetospheric sub storms), and its main source and drivers are the following phenomena: gyromagnetic resonance of electrons with an energy of 1 keV (and more) around the magnetic field lines of a planet in the cyclotron of frequency; plasma of planet's magnetosphere and the solar wind plasma.

In [8] it is proposed and experimentally proved the law of "Universal Planck proportions." According to this law, in the observable universe, any body with mass m, creates a gravitational field, which bends the surrounding space with a radius of curvature S (in fact, S - is the length of a gravitational wave) and introduces time delay in signal propagation t_{dm} into this space. Characteristics of the body m, S and t_{dm} are interconnected with universal Planck proportions [8]:

$$m = \frac{m_p}{l_p} S; m = \frac{m_p}{t_p} t_{dm}; S = \frac{l_p}{t_p} t_{dm}; S = \frac{l_p}{m_p} m; t_{dm} = \frac{t_p}{l_p} S; t_{dm} = \frac{t_p}{m_p} m, \quad (1)$$

where: l_p, m_p, t_p - is Planck's constant, correspondingly - length, mass and the Planck time.

Based on the data about the mass of astronomical objects [9] and universal Plank proportions (1) there were calculated length value of a gravitational wave and frequency for thus: Earth, Jupiter, Saturn, Sun [8]:

Name	Weight, kg	Length of a gravitational wave, m	Frequency, GHz
Earth	5.9722×10^{24}	0.00443474	67.6
Jupiter	1.8981×10^{27}	1.40948454472	0.2127
Saturn	5.6832×10^{26}	0.42201429314	0.7104
Sun	1.989×10^{30}	1477.036	$2{,}0297 \times 10^{-4}$

In [10] demonstrated the existence of gravitational-electromagnetic resonance of the Sun in the low-frequency spectrum of the radio emission of the Earth and Saturn. We show the existence of gravitational-electromagnetic resonance of the Sun in the low-frequency spectrum of the radio emission of Jupiter.

2. The gravitational-electromagnetic resonance of the Sun in the low-frequency spectrum of the radio emission of the Earth and Saturn

Gravitational-electromagnetic resonance of the Sun [10] has varying degrees of influence on the auroral

radio emission planets. For comparison, the overall picture of the auroral radio emission of 5 planets is shown in Fig. 1 [7], which shows graphs of dependence of the spectrum of electromagnetic signals the auroral radio emission to the frequency.

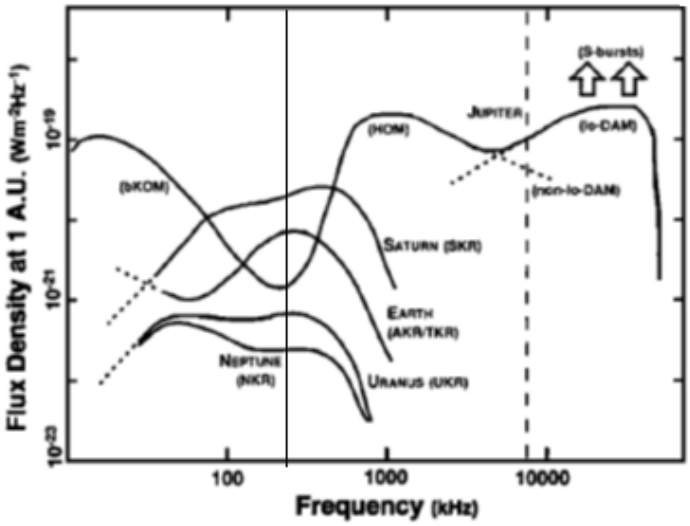

Fig. 1. Comparative spectra of auroral radio emissions of 5 planets: Earth, Saturn, Jupiter, Neptune and Uranus [7].

The auroral radio emission of Uranus and Neptune, as seen from their graphs in Fig. 1 are similar to each other. Despite the fact that the frequency of GERS is in the local maxima of the graphs, the impact of GERS on the auroral radio emission of Uranus and Neptune is minimal. This is due to the considerable distance of the planets from the Sun and therefore a significant reduction in its gravitational potential and a decrease in the density of the solar wind at the location of Uranus and Neptune.

Influence of GERS on the magnetosphere of Jupiter and consequently on his the auroral radio emission is lower than for example in the auroral radio emission of Earth and Saturn (see. Fig. 1). GERS frequency 202.97 kHz is located in a local minimum of low-frequency spectrum of the radio emission of Jupiter.

GERS frequency 202.97 kHz is located in a local maximum of low-frequency spectrum of the radio emission of Earth and Saturn.

As for Saturn in [11] it is presented the results of experiments conducted on board of the Cassini spacecraft studying the effect of radio waves, the waves in the plasma and of the solar wind at auroral radio emission of Saturn. These experiments are the Radio and Plasma Wave Science experiment (RPWS) [12], the Dual Technique Magnetometer (MAG) [13] and the Cassini Plasma Spectrometer (CAPS) [14]. At Fig. 2a (spectrum was obtained in the experiment Cassini - RPWS in the time interval 08/19/2004 - 08/21/2004, that is, day of year DOY 232.5-234.0) and Fig. 3a (DOY 224.0-240.0) [11] present the dynamic spectra, which was obtained during the experiment Cassini - RPWS. In the figures it is clearly seen almost continuous line of high values of the power spectral density of electromagnetic signals at frequencies close to the frequency of 202.97 kHz. At the same time, at other frequencies the spectral power density of the electromagnetic signal is of an intermittent nature. At Fig. 2b in the experiment Cassini - RPWS presents research of the Stokes parameter (Stokes parameter S = total intensity), and Fig. 2c and Fig. 2d present studies of the degree of polarization of the signal, respectively, the circular 2c and line 2d. All figures show the line corresponding to the presence of gravitational-electromagnetic resonance of the Sun at frequency 202.97 kHz.

According to the experimental studies Cassini and Voyager missions, according to [15,16] frequency of auroral radio emission range of Saturn is in the range from several kHz to 1.2 MHz - 1.3 MHz with a peak of signal at a frequency of about 200 kHz. That also confirms the assumption [10]: GERS can be a secondary source auroral radio emission of Saturn at a frequency of 202.97 kHz.

GERS has the greatest influence on the auroral radio emission of Earth. Nature, sources and parameters of the auroral radio emission of Earth studied, for example, in [1,2,3,4,5,6,7,17,18]. In [17] it is presented the results of experiments on the auroral radio emission of Earth, carried on a space probe JIKIKEN (EXOS-B). The authors note that the peak of the power spectrum of signals auroral radio emission of Earth is in the range from 100 kHz to 300 kHz. On the spectrum of auroral radio emission of Earth [17] in Fig. 4 it is clearly seen almost continuous line of signal intensity of auroral radio emission of Earth at a frequency of approximately 202.97 kHz. At the same time, at other frequencies the signal intensity of auroral radio emission of Earth is usually intermittent nature. The presence of a solid line at the frequency of 202.97 kHz says about the relative stability of the signal source at that frequency. The nature of the spectra in Fig. 4 confirms the earlier suggestion that the cyclotron maser mechanism is the primary source of auroral radio emission of Earth. Further, the primary resonance frequencies near 202.97 kHz is captured by electromagnetic gravitationally resonance of the Sun and as the gravity of the Sun is always present,

there is the effect of gravity - electromagnetic generator on frequency 202.97 kHz with paging signal at the cyclotron frequency (or its harmonics).

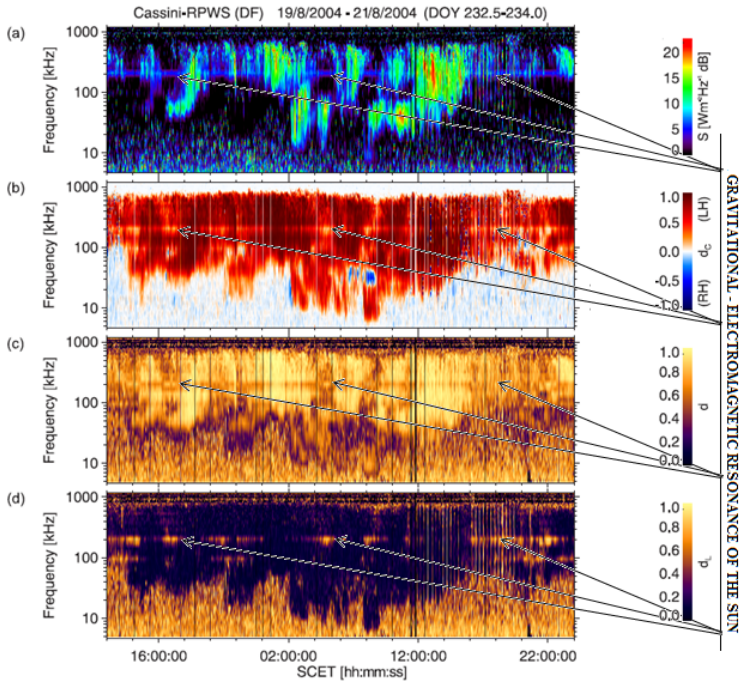

Fig.2. Cassini-RPWS dynamic spectra for (a) the Stokes parameter S (= total intensity), (b) the degree of circular polarization dc, (c) the degree of polarization d and (d) the degree of linear polarization d_L as a result of the Direction-Finding computations for the time period DOY 232.5–234.0, 2004 [11].

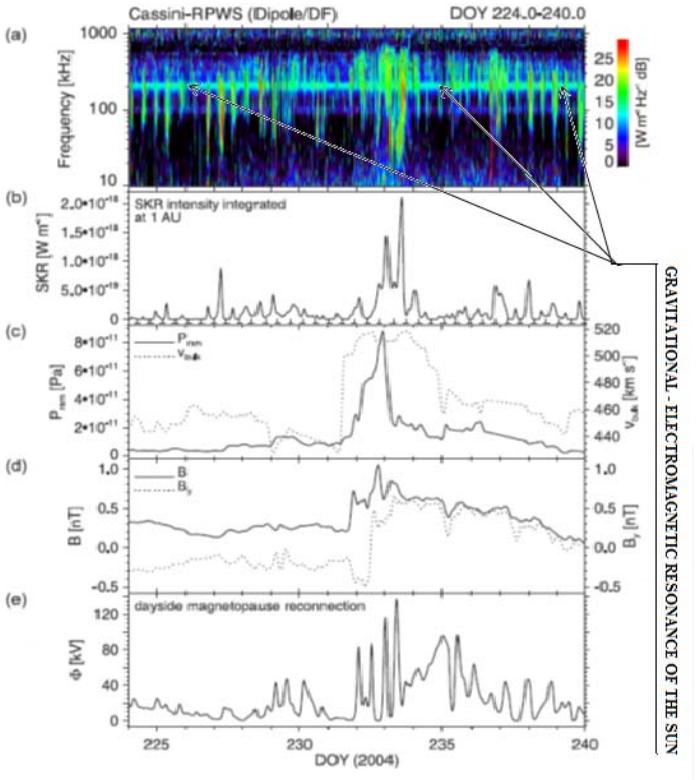

Fig. 3. (a) The RPWS dynamic spectrum, (b) the integrated intensity radio emission profile, (c) profiles for the SW ram pressure (solid) and bulk velocity (dotted), (d) profiles for the interplanetary magnetic field strength (solid) and its y-component (dotted) in KSM-coordinates and (e) the profile of the reconnection voltage at the dayside magnetopause of Saturn during DOY 224–240, 2004 [11].

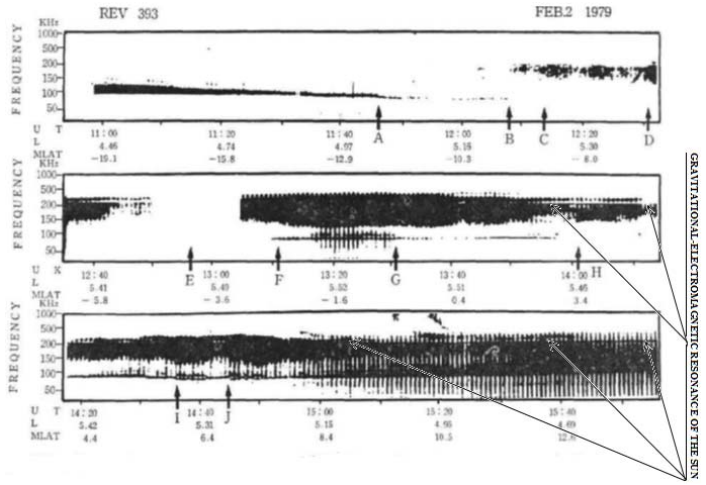

Fig.4. Dynamic spectrum of the auroral radio emission of Earth with a space probe JIKIKEN [17].

During the experiment POLRAD mission Interball 2 it was obtained spectrum of auroral radio emission of Earth in the range of 4 KHz - 1 MHz. In Fig. 5 [18] in addition to the fundamental frequency of 202.97 kHz GERS it is shown second and third harmonics at frequencies of about 406 kHz and 609 kHz.

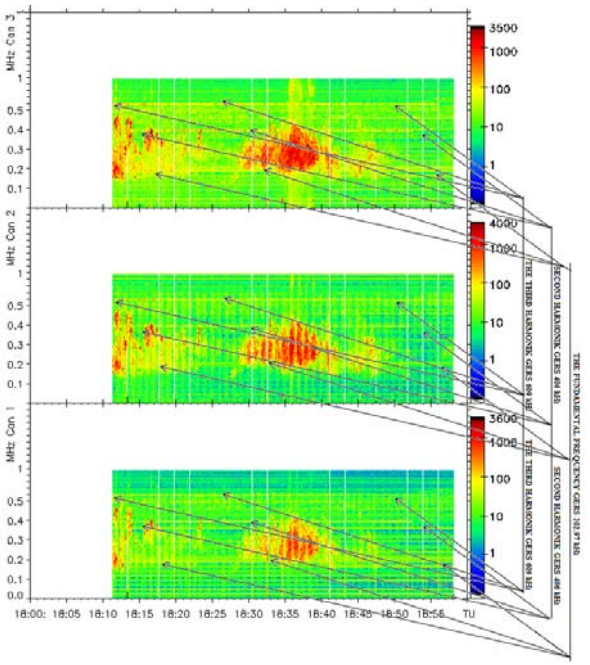

Fig.5. Dynamic spectrum of the auroral radio emission of Earth with Interball 2 by the POLRAD radio-spectro-polarimeter [18].

The presence of higher harmonics GERS in the spectrum of the auroral radio emission of Earth says that the GERS is stable and stationary secondary source of auroral radio emission.

3. The gravitational-electromagnetic resonance of the Sun in the low-frequency spectrum of the radio emission of the Jupiter

The frequency 202.97 kHz of the gravitational-electromagnetic resonance of the Sun in the low-frequency of radio spectrum of the Jupiter is located in a range a local minimum intensity of the radio emission of Jupiter (see Fig.1).

In [19] presented a study of low-frequency spectrum of the radio emission of Jupiter, which is obtained by the Cassini mission. In Fig. 6, Fig. 7 and Fig. 8 shows the spectra of Jupiter's radio emission, which are obtained in the course of these studies.

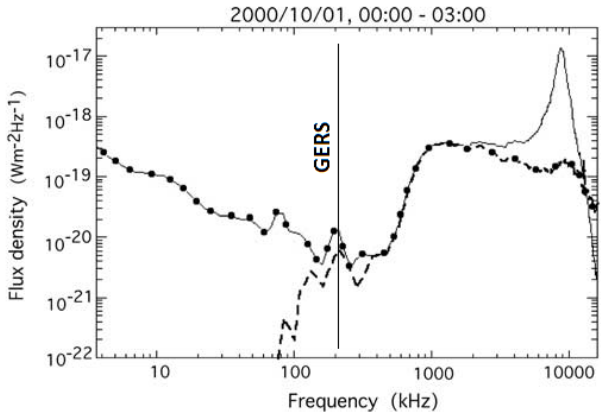

Fig.6. Average spectrum of Jovian radio emissions measured by Cassini [19].

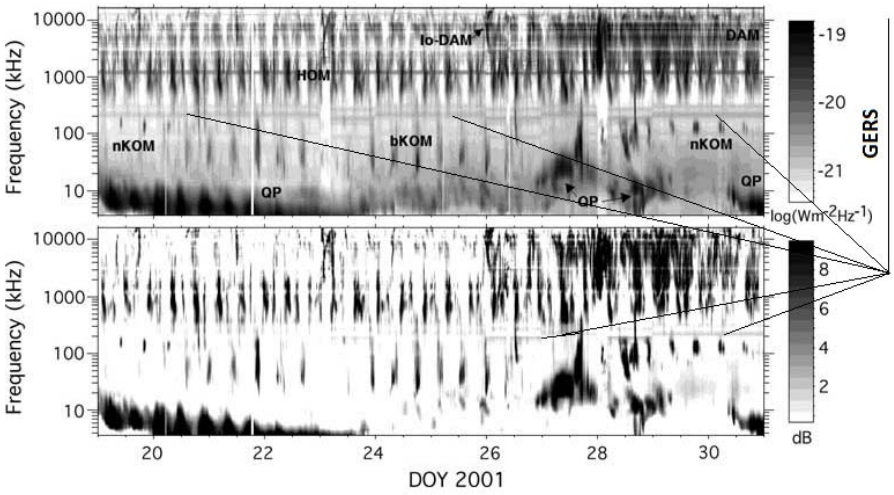

Fig.7. Long-term dynamic spectra of Jovian radio emissions measured by Cassini [19].

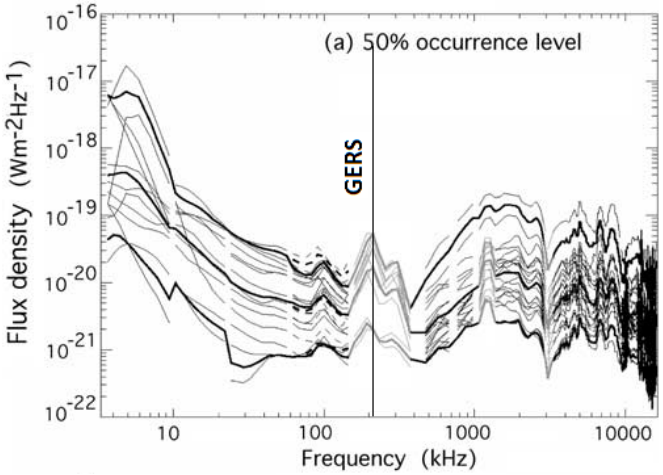

Fig.8. Individual spectra of Jovian radio components computed over 21 selected time intervals during which one or several components is present. Flux density level exceeded 50% of the time [19].

According to the experimental studies of Cassini mission, a local maximum of the spectrum of radio emission of Jupiter is at a frequency close to the frequency 202.97 kHz – it is a frequency of the gravitational-electromagnetic resonance of the Sun.

Conclusion

The experimental studies of mission's: Cassini, JIKIKEN, Interball 2and Voyager indicate that the low-frequency spectrum of the radio emission from Earth, Saturn and Jupiter have a component at the frequency of 202.97 kHz, which corresponds to the presence of gravitational-electromagnetic resonance of the Sun.

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