

Study of gravity properties on the earth surface using a gravity receiver

Volodimir Landin

Private Research Laboratory "Gravity-Land"
40016, 44/2 Svobody Ave., Sumy, Ukraine

Eduard Sluginov

Private Research Laboratory "Gravity-Land"
40016, 44/2 Svobody Ave., Sumy, Ukraine

Anastasia Sluginova

Private Research Laboratory "Gravity-Land"
40016, 44/2 Svobody Ave., Sumy, Ukraine

Olga Sluginova

Private Research Laboratory "Gravity-Land"
40016, 44/2 Svobody Ave., Sumy, Ukraine

Abstract

Relevance. This study is relevant as it provides a novel approach to measuring and analyzing the effects of gravitational forces from the Earth, Moon, Sun, Black Hole, and space-time, offering new insights into the complex interactions between gravity and space-time matter.

Purpose. The purpose of this study was to investigate the properties of the gravitational field on the Earth's surface and the influence of the Moon, Sun, space-time and Black hole on them. For this purpose, a gravity receiver was made, which is a lever with arms of different lengths located on a sharp support.

Methodology. Due to this design, it is possible to observe a change in the position of the lever relative to the horizon, depending on the magnitude of the gravitational torques on the Earth's surface. The specific feature of such a gravity receiver is that it can rotate at a certain angle without friction on a sharp support, as if it were in outer space. It is used to determine the torques of gravity of the Earth, Moon, Sun, Black hole, and space-time matter.

Results. The torques of gravity act along the latitude of the Earth and along its meridian. The moments of gravity along the Earth's meridian change in waves throughout the year. The torques along the latitude are on average twice as large as along the meridian. The space-time matter has the greatest moments, which, starting in 2022, acts in the direction of the Earth's rotation. Theoretically, it has been theoretically proved that, if baryonic matter is excluded, constant gravity is determined by a simple and beautiful formula which shows that if the density of space decreases, its matter passes into the matter of time, which increases and vice versa, if time decreases, it passes into the matter of space, whose density increases. Gravity is the stabilizer of this process. Experiments have shown that space-time matter can form gravitational vortices and powerful gravitational waves called "tsunamis".

Conclusions. The gravity receiver performs constant oscillatory movements in the vertical plane throughout the year due to the gravitational energy of space-time. If the arm of the gravity receiver is two meters long, then it captures two-meters gravity waves, if its length is one centimeter, then it captures centimeter waves, etc.

Keywords: gravity; space; time; gravity receiver.

Suggested Citation:

Landin V, Sluginov E, Sluginova A, Sluginova O. Study of gravity properties on the earth surface using a gravity receiver. *Sci Herald Uzhhorod Univ Ser Phys.* 2025;(56):2798-2803.

*Corresponding author



Copyright © The Author(s). This is an open access article distributed under the terms of the Creative Commons Attribution License 4.0 (<https://creativecommons.org/licenses/by/4.0/>)

Introduction

In gravitational space, in addition to the force of gravity, there are also vertical torques of gravity. These moments act along the meridians of the Earth and its parallels. Experiments show that vertical and horizontal moments are not equal. The baryonic matter (Earth, Moon, Sun, Black hole of the Milky Way) and the space-time matter have their own torques. The magnitudes of the torques of baryonic matter depend on the mass of the astronomical object and on the distance to the Earth. As for the space-time matter, it has powerful, constantly changing torques. This indicates that its density also varies over time. Theoretically, if baryonic matter is excluded, only space, time, and gravity remain. There is a close and eloquent relationship between them, where the gravity constant is constant, and time and space density change.

The manifestations of gravity as a force through the mass density of space and the values of time can be derived from Newton’s and Einstein’s theories on the interaction of masses of matter. In this case, the concept of gravity of the space-time continuum is more clearly defined. And the gravity constant can be expressed in terms of two parameters, namely, time and the density of matter in space.

From Newton’s equation on the force of mass interaction (1):

$$F = \frac{GM_{st}M_b}{R^2} = \alpha \times M_b, \tag{1}$$

where F – gravitational force of the mass of space-time and the mass of baryonic matter, H; G – gravitational constant, $m^3/kg \times s^2$; M_{st} and M_b – masses of space-time and baryonic matter, respectively, kg; R – average distance between the masses of matter, m; α – acceleration between the masses of matter, m/s^2 .

The following expression can be found (2):

$$G = \frac{1}{\rho_{st} \times t^2} = constant, \tag{2}$$

where ρ_{st} – density of space, kg/m^3 ; t – time of space, s.

In this case, gravity behaves like a force between masses of matter, the constant of which is equal to the inverse of the product of the density of space squared by time. This is the simplest concept of gravity. Time can be a positive or negative value. If time is positive during the expansion of the universe, then when it contracts, time will be negative, but it always flows from the past to the future.

Expression (2) indicates that if the density of space decreases, then time increases due to the space that is currently occurring in our universe, as astronomers’ observations show in [1, 2]. In empty space without baryonic matter, time can only increase at the expense of space, because there is nothing else. Therefore, when expanding, the matter of space turns into the matter of time, which increases, and when it contracts, time turns into space and decreases. This is the great cycle of matter in the universe, that is, the transition of matter from one type to another and vice versa. Gravity is the stabilizer of this process.

Equation (2) shows that space cannot expand or contract indefinitely, since there are Planck limit values [3, 4] for time and space density.

Experiments show that gravity has torques on the Earth’s surface (Figure 1).

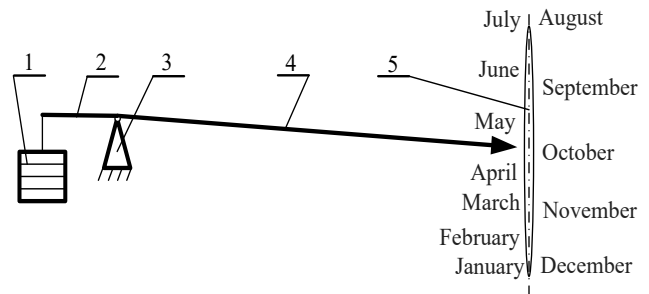


Figure 1. Diagram of a gravity receiver that makes constant movements due to the energy of space-time
Note: 1 – load; 2 – short lever arm; 3 – support; 4 – long lever arm; 5 – scale.
Source: compiled by the authors

Figure 1 shows the scheme of the gravity receiver used in the experiments.

A gravity receiver with arms of different lengths that performed constant oscillatory movements in a vertical plane: 7 months in one direction and 5 months in the other.

In some parts of the universe, where there are a significant number of small black holes that are invisible to astronomers, the density of space-time is very high. Therefore, it can be mistaken for dark matter [5]. There is no dark matter in the universe, but there is space-time matter with different densities and an average internal pressure of 23 Pa at present [6, 7], which expands it.

Experimental determination of the vertical torques of gravity of celestial bodies

The studies were conducted at the Earth's latitude of 50° 55'N and longitude of 34° 48' E. The experiments used different lengths of levers and the results were summarized by a single two-meters lever. According to the Figure 2, the following arrangement of astronomical components can be seen [8, 9]:

- the Black hole and the Sun are always on the same line;
- the Black hole, the Sun, the Earth, and the Moon are on the same line 4 times a year with an assumption of 14.8 days. For example: January 6 and January 21, 2019.

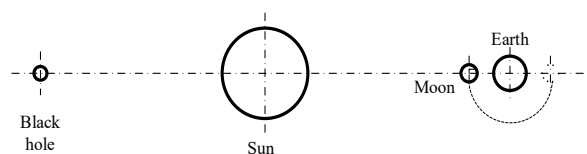


Figure 2. Layout of astronomical objects on January 6, 2019 and January 21, 2019 (dotted line), for determining the vertical torques of gravity of celestial bodies and gravitational space-time

The gravitational torques of the Earth, Moon, Sun, and Black hole change due to changes in the density of space-

time, which undulates or decreases the torques of its gravitational space in relation to the planet Earth.

According to the Figure 2, it is possible to determine the total vertical torque along the latitude of the Earth for five astronomical components at the time of day when the Sun is at its zenith using the equation (3):

$$T_1 = T_e - T_m - T_s - T_{bh} + T_{st}, \quad (3)$$

where T_1 – total torque, Nmm; T_e – torque of Earth, Nmm; T_m – torque of Moon, Nmm; T_s – torque of Sun, Nmm; T_{bh} – torque of the Black hole, Nmm; T_{st} – torque of the space-time (ST) matter, Nmm.

12 hours after the Earth the turn to 180 degrees, the total torque is (4):

$$T_2 = T_e - T_m - T_s - T_{bh} + T_{st}, \quad (4)$$

The Moon’s torque on the Earth’s surface is determined by the equation (5):

$$T_m = (T_2 - T_1 + T_4 - T_3)/4, \quad (5)$$

The torques of other astronomical objects can be determined in the same way.

Experimental studies on January 6 and 21, 2019 at the Earth’s latitude 50°55’N showed the following values of gravity torques: $T_1=1.2806$ Nmm; $T_2=1.297$ Nmm; $T_2-T_1=0.0164$ Nmm; $T_3=1.2831$ Nmm; $T_4=1.2914$ Nmm; $T_4-T_3=0.0083$ Nmm. According to these data, $T_m=0.0062$ Nmm; $T_s=0.00286$ Nmm; $T_e=0.064$ Nmm; $T_{st}=1.224$ Nmm.

The conducted studies have shown that in the gravitational space of the Earth, the dominant position regarding torques is occupied by space-time matter (ST). This statement can be illustrated by a graph of changes in the vertical torque of ST matter, for example, in June 2017 (Figure 3).

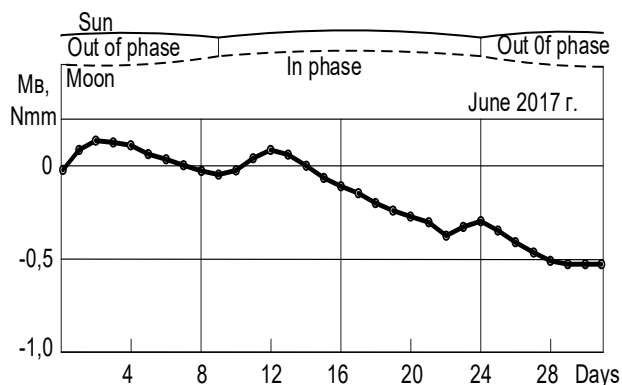


Figure 3. Variation of vertical gravitational wave torque of ST in June 2017

As can be seen from the Figure 3, the vertical torque of gravity varies from 0.2 Nmm to -0.5 Nmm, regardless of the position of the Sun and Moon during the month. The Sun and Moon have virtually no effect on the change in torque in the Earth's gravitational field when acting together, when they are in the same phase or opposite phase. The matter of space-time (ST) completely dominates.

A similar situation is observed at other times of the year. The Figure 3 shows a gradual decrease in torque over the course of a month. According to the authors, such changes occur in accordance with the processes taking place in the far and near space, which change the torques of gravity on the Earth’s surface.

From the first days of March to the end of 2013, it was possible to observe an increase in gravity torque for six months. As soon as the new, two-meter gravity receiver was installed in the zero position and put into operation along the Earth's latitude, it began to rapidly show an increase in gravity torque, at a previously unprecedented rate (Figure 4). From March 3 to September 14, i.e., in 196 days, the moment increased from -1.0 to 1.3 Nmm.

After that, it began to decrease and dropped to 1.2 Nmm on September 24. Then there was a period of silence until the end of 2013. This study can be described as the process of detecting a gravitational wave “tsunami”.

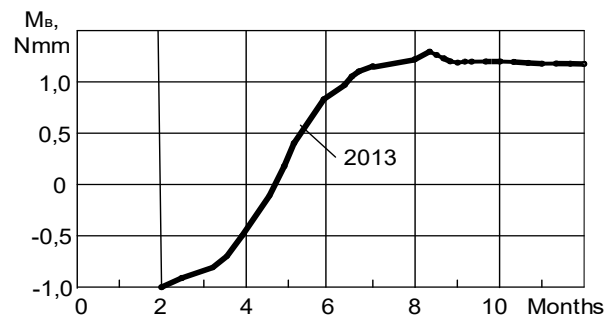


Figure 4. Variation of gravitational wave torque of ST matter along the Earth's latitude (50°55’N) in 2013

According to the authors, a gravitational “tsunami” could have appeared as a result of the condensation of space-time matter in the zone of a heavy star, followed by the explosion of this star. In this case, ST matter accelerated in all directions of the universe and finally reached the Earth in 2013. Perhaps this is not the last big gravitational wave. After that, it began to decrease and dropped to 1.2 Nmm on September 24. Then there was a period of silence until the end of 2013.

Changes in gravitational torques along the Earth meridian 34°48'E

The gravitational torques of space-time along the meridian of the Earth (south-north) are on average 2 times less than those along the latitude of the Earth. In some months, they are very active and vary widely, for example, in April 2022 from -0.15 Nmm to 0.1 Nmm. In June 2022, the moments varied from -0.1 Nmm to 0.1 Nmm.

In other months of 2022, the torques were minimal. For example, in August 2022, starting on the 17th, the arrow of the gravity receiver was in the zero position until the end of the month.

Over the course of two years (2021-2022), the gravitational torques along the Earth’s meridian undulated from -0.15 Nmm to -0.03 Nmm (Figure 5).

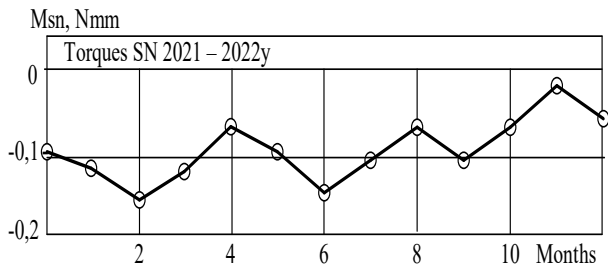


Figure 5. Variation of space-time gravitational torques along the Earth meridian equal to 34°48'E by average values for two years (2021-2022)

Changes of gravitational torques along the latitude of the Earth equal to 50°55'N

Starting from 2017 to 2021, inclusive, the gravity receiver located along the latitude of the Earth equal to 50°55'N in December returned to its original position annually with a slight deviation in one direction or another from the starting point of -2.8 Nmm (Figure 6).



Figure 6. Variation of gravitational torques in 2021 along the latitude of the Earth equal to 50°55'N

But in 2022, the lever operating along the Earth's latitude did not return to its original position (Figure 7).

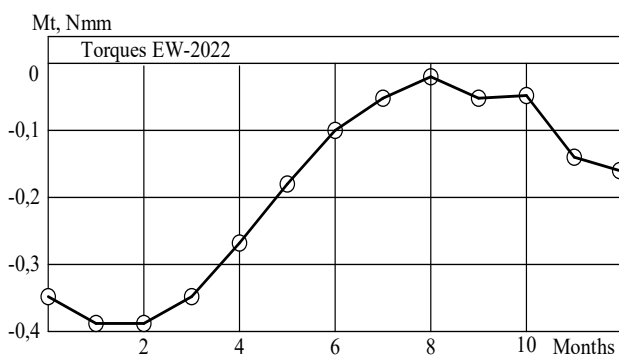


Figure 7. Variation of gravitational torques in 2022 along the latitude of the Earth equal to 50°55'N

During these years, the torques of gravity acted towards the rotation of the Earth. According to the Figure 7, space-time gravity increased the torques of gravity for seven months during the Earth's rotation and decreased the torques by the same amount in four months.

According to the Figure 6, the torques at the end of 2022 did not decrease by the initial amount, but continued to act towards the rotation of the Earth.

In December 2022, the lever stopped at -0.16 Nmm, before reaching the starting point of 0.22 Nmm. Since this year, the pattern of changes in the position of the lever has begun to change towards an increase in the moments of gravity.

Based on experimental studies, the centre of space-time matter is located on the Earth-Sun-Black hole line in August, judging by the maximum gravitational torques on the Earth's surface along the Earth's latitude. Based on the minimum torques along the Earth's latitude, the centre of space-time matter is located on the Black hole-Sun-Earth line in January-February.

Conclusions

Vertical structures of the gravitational torques of the Globe, Moon, Sun, Black hole, and space-time matter have been experimentally revealed. Gravitational torques were observed along the meridian equal to 34°48'E (South-North), and along the latitude 50°55'N (East-West). The identified moments are constantly changing. This indicates that the density of space-time and the magnitude of gravity in the Earth's zone are not stable.

Values of the vertical torques of gravity along the latitude of the Earth 50°55'N in 2019 are determined as follows: for planet Earth, $T_e=0.064$ Nmm; for Moon, $T_m=0.0062$ Nmm; for Sun, $T_s=0.00286$ Nmm; for space-time matter, $T_{st}=1.224$ Nmm.

The impact of a Black hole on the solar system is insignificant.

Magnitude of the gravitational torques of the space-time matter along the latitude of the Earth is 2 times greater than the torques along the meridian, on average.

The torque of the Earth's gravity is 19.1 times less than the torque of the space-time matter at the latitude of the Earth, equal to 50°55'N.

Space-time matter has a huge mass, judging by the torques that have been determined experimentally and is approximately 94.4% of the total mass of matter in the solar zone.

Gravitational torques of space-time matter are constantly changing, that is, its density on the Earth's surface is systematically changing.

Torques of gravity along the Earth's meridian change in waves throughout the year.

Torques of gravity along the Earth's latitude increased by August, and then decreased by the end of the year.

Based on experimental studies, the centre of space-time matter is located on the Earth-Sun-Black hole line in August, judging by the maximum gravitational torques on the Earth's surface along the Earth's latitude. Based on the minimum torques along the latitude of the Earth, the centre of the space-time matter is located on the Black hole-Sun-Earth line in January-February.

Experiments have shown that the space-time matter can form gravitational vortices and powerful gravitational waves "tsunami".

If the density of the matter of space increases, time decreases and turns into the matter of space. If this density decreases, then time increases at the expense of space. This process confirms the law of the matter cycle in the universe, i.e., the transition of matter from one type to another and vice versa. Gravity is the stabilizer of this process.

Space-time cannot expand or contract indefinitely, since there are Planck limits on the density of matter in space and the density of time.

Acknowledgements

There are none.

Conflict of Interest

There are none.

References

- [1] Greene B. The elegant universe: Superstrings, hidden dimensions, and the quest for the ultimate theory. New York: W.W. Norton; 1999.
- [2] Malkan MA, Zuckerman B. Origin and evolution of the universe: From big bang to exobiology. New York: World Scientific Publishing Co Pte Ltd; 2020.
- [3] Kisak PF. Planck Units: The fundamental units of our universe. Cambridge: CreateSpace Independent Publishing Platform; 2015.
- [4] Benenson WQ, Harris JW, Stocker H, Lutz H. Handbook of physics. New York: Springer; 2002.
- [5] Tiwari P, Bandyopadhyay MN, Chatterjee S, Bandyopadhyay S. Expansion of the universe and its correlation with dark energy. *Int J Adv Astroom*. 2020;8(1):10-18.
- [6] Baker Jr. R. A theory of our universe. *J High Energy Phys Gravit Cosmol*. 2020;6(4):609-622.
- [7] Le TD. Stringent limit on space-time variation of fine-structure constant using high-resolution of quasar spectra. *Heliyon*. 6(9):e05011.
- [8] Blackhirst R. Astrology. In: D.A. Leeming (Ed.), *Encyclopedia of Psychology and Religion* (pp. 124-126). New York: Springer; 2013.
- [9] Solar and lunar eclipses worldwide – Next 10 years. <https://www.timeanddate.com/eclipse/list.html>
- [10] Izzet AK, Hamwdi MJ, Jasim AT. Analytical study of Earth tides on low orbits satellites. *Iraqi J Sci*. 61(2):453-461.
- [11] Li K, Wang J, Shi Y. A review of studies on mass-movements on the Moon. *Front Astron Space Sci*. 10:1223642.
- [12] Marshall P. The role of quantum mechanics in cognition-based evolution. *Progr Biophys Molec Biol*. 180-181:131-139.
- [13] Aschwanden MJ. The Sun. In: T. Spohn, D. Breuer, T.V. Johnson (Eds.), *Encyclopedia of the Solar System* (pp. 235-259). Amsterdam: Elsevier; 2014.
- [14] Deparis V. A history of the global understanding of the Earth. *Comptes Rendus Geosci*. 346(11-12):275-278.
- [15] Weber RC. Interior of the Moon. In: T. Spohn, D. Breuer, T.V. Johnson (Eds.), *Encyclopedia of the Solar System* (pp. 539-554). Amsterdam: Elsevier; 2014.
- [16] Hu W-Y, Nakayama K, Takhistov V, Tang Y. Gravitational wave probe of Planck-scale physics after inflation. *Phys Let B*. 856:138958.
- [17] Metzger PT, Grundy WM, Sykes MV, Stern A, Bell III JF, Detelich CE, et al. Moons are planets: Scientific usefulness versus cultural teleology in the taxonomy of planetary science. *Icarus*. 374:114768.

Дослідження властивостей сили тяжіння на земній поверхні за допомогою приймача сили тяжіння

Володимир Ландін

Приватна науково-дослідна лабораторія «Гравітація-Земля»
40016, просп. Свободи, 44/2, м. Суми, Україна

Едуард Слугінов

Приватна науково-дослідна лабораторія «Гравітація-Земля»
40016, просп. Свободи, 44/2, м. Суми, Україна

Анастасія Слугінова

Приватна науково-дослідна лабораторія «Гравітація-Земля»
40016, просп. Свободи, 44/2, м. Суми, Україна

Ольга Слугінова

Приватна науково-дослідна лабораторія «Гравітація-Земля»
40016, просп. Свободи, 44/2, м. Суми, Україна

Анотація

Актуальність. Це дослідження є актуальним, оскільки пропонує новий підхід до вимірювання та аналізу впливу сил тяжіння від Землі, Місяця, Сонця, чорної діри та простору-часу, пропонуючи нове розуміння складної взаємодії між гравітацією та просторово-часовою матерією.

Мета. Метою цього дослідження було дослідити властивості гравітаційного поля на поверхні Землі та вплив на них Місяця, Сонця, простору-часу та чорної діри. Для цього був виготовлений гравітаційний ресивер, що представляє собою важіль з плечами різної довжини, розташованими на гострій опорі.

Методологія. Завдяки такій конструкції можна спостерігати зміну положення важеля відносно горизонту в залежності від величини гравітаційних моментів на поверхні Землі. Особливість такого гравітаційного приймача полягає в тому, що він може обертатися під певним кутом без тертя об гостру опору, як у відкритому космосі. Він використовується для визначення моментів сили тяжіння Землі, Місяця, Сонця, чорної діри та просторово-часової матерії.

Результати. Моменти сили тяжіння діють уздовж широти Землі та вздовж її меридіана. Моменти сили тяжіння вздовж земного меридіана змінюються хвилями протягом року. Круті моменти по широті в середньому вдвічі більші, ніж по меридіану. Найбільші моменти має просторово-часова матерія, яка, починаючи з 2022 року, діє в напрямку обертання Землі. Теоретично було доведено, що якщо виключити баріонну матерію, постійна гравітація визначається простою і красивою формулою, яка показує, що якщо щільність простору зменшується, його матерія переходить у матерію часу, яка збільшується, і навпаки, якщо час зменшується, вона переходить у матерію простору, щільність якої зростає. Гравітація є стабілізатором цього процесу. Експерименти показали, що речовина простору-часу може утворювати гравітаційні вихори і потужні гравітаційні хвилі, звані «цунами».

Висновки. Гравітаційний приймач протягом року здійснює постійні коливальні рухи у вертикальній площині за рахунок гравітаційної енергії простору-часу. Якщо плече гравітаційного приймача має довжину два метри, то воно вловлює двометрові гравітаційні хвилі, якщо його довжина один сантиметр, то воно вловлює сантиметрові хвилі і тощо.

Ключові слова: гравітація; простір; час; гравітаційний приймач.