The Confirmed Cosmic Energy Gravitational Genesis of the Strongest Japanese, Italian, Greek, Chinese and Chilean Earthquakes

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The Confirmed Cosmic Energy Gravitational Genesis of the Strongest Japanese, Italian, Greek, Chinese and Chilean Earthquakes

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Abstract:

The article presents (on February 13, 2018 after the final correction of the article) the confirmed validity of the cosmic energy gravitational genesis of the strongest Japanese (for 2015 and 2016), Italian (for 2016), Greek (for 2017), Chinese (for 2008 and 2017) and Chilean (for 2015 and 2016) earthquakes related with the extreme (maximal and minimal, respectively) combined integral energy gravitational influences (in accordance with the established in 2012 global prediction thermohydrogravidynamic principles of the cosmic seismology) on the internal rigid core of the Earth (and on the Earth as a whole) of the planets (Mercury, Venus, Mars and Jupiter) and the Sun due to the gravitational interactions of the Sun with Jupiter Saturn, Uranus and Neptune. We have shown that the first direct detection of gravitational waves (on September 14, 2015) is located between the calculated date $t^*(\tau_{c,r}, 2015) = 2015.6833$ (corresponding approximately to September 6, 2015 of the maximal (in 2015) combined planetary and solar integral energy gravitational influence on the internal rigid core of the Earth) and the date (September 16, 2015 according to the U.S. Geological Survey) of the strongest (in 2015 according to the U.S. Geological Survey) 8.3-magnitude Chilean earthquake (realized near 10 days after the date $t^*(\tau_{c,r}, 2015) = 2015.6833$).

Keywords:

Thermohydrogravidynamic Theory, Non-Stationary Cosmic Gravitation, Cosmic Geophysics, Cosmic Seismology, Cosmic Geology, Generalized First Law of Thermodynamics, Global Seismotectonic, Volcanic and Climatic Processes, Seismotectonic Processes in Japan, Italy, Greece, China, Chile and The Sea of Okhotsk.

1. Introduction

The prediction of the strongest seismotectonic [1-4], volcanic [4, 5] and climatic [4, 6, 7] processes of the Earth are the urgent problems [8-10] for humankind before the founded [9, 10] increased intensifications (during the forthcoming range 2020÷2026 [9, 10]) of the global natural (seismotectonic, volcanic, climatic and magnetic) processes [9, 10] of the Earth. We presented [11] the confirmed validity of the thermohydrogravidynamic theory [2-4, 7-12] of the global natural processes concerning the strongest intensifications of the global natural processes of the Earth in 2016 since 1 September, 2016 and before 26 January, 2017.

We presented [11] the unquestionable facts (which confirm the Gutenberg's [13] idea about the global seismic-climatic relation) that the powerful (6.5-magnitude according to the Japan Meteorological Agency, 6.2-magnitude according to the U.S. Geological Survey) earthquake (occurred on 23 September, 2016 southeast of Tokyo and 143 km ESE of Katsuura according to the U.S. Geological Survey) and the powerful (6.6-magnitude according to the Japan Meteorological Agency, 6.2-magnitude according to the U.S. Geological Survey) earthquake (occurred on 21 October, 2016 in Tottori about 430 miles west of Tokyo and 6 km S of Kurayoshi according to the U.S. Geological Survey) were realized during the predicted (in advance [11], on 31 August, 2016) range (19 September ÷ 23 October, 2016) of the probable strongest intensifications (characterized by the corresponding probability Pr=0.416 [11]) of the global seismotectonic and climatic processes of the Earth in 2016 since 1 September, 2016.

Taking into account the confirmed validity of the prediction of the thermohydrogravidynamic theory [2-4, 7-12] concerning the strongest intensifications of the global natural processes of the Earth since 1 September, 2016 and before 26 January, 2017, the main aim of this article (for International Technology and Science Publications) is to confirm of the established [2] cosmic energy gravitational genesis of the strongest Chinese and Japanese earthquakes. The second aim of this article is to present the evidence of the cosmic energy gravitational genesis of the strongest Italian, Greek and Chilean earthquakes.

In Section 2 we present the established generalized differential formulation (1) of the first law of thermodynamics [2-4, 7-12, 14] for the symmetric stress tensor $\mathbf{T}$ [15] and the established [9-11] global prediction thermohydrogravidynamic principles (8) and (9) determining the maximal temporal intensifications of the global and regional natural (seismotectonic, volcanic, climatic and magnetic) processes of the Earth related with the maximal and minimal combined cosmic integral energy gravitational influences ((8) and (9), respectively, for the time moments $t = t^{*}(\tau_{c,r})$ and $t = t_{*}(\tau_{c,r})$) on the considered internal rigid core $\tau_{c,r}$ (of the Earth) subjected to the combined cosmic integral energy gravitational influence of the planets of the Solar System, the Moon and the Sun (owing to the gravitational interaction of the Sun with the outer large planets).

In Section 3 we present the obtained results and discussion. In Section 3.1 we present the confirmed [11] validity of the global prediction thermohydrogravidynamic principle (8) of the thermohydrogravidynamic theory [2-4, 7-12] concerning the strongest intensifications (predicted on 31 August, 2016 [11]) of the global natural (seismotectonic and climatic) processes of the Earth in 2016 since 1 September, 2016 and before 26 January, 2017. Section 3.1 presents also the confirmed validity (for 2016) of the established [2] cosmic energy gravitational genesis of the strongest

Japanese (in 2016) and the strongest Italian (in 2016) earthquakes occurred near the calculated date $t^{*}(\tau_{c,r}, 2016) = 2016.7666$ corresponding to the maximal (in 2016) combined planetary and solar integral energy gravitational influence (8) on the internal rigid core $\tau_{c,r}$ of the Earth. Section 3.2 presents the confirmed validity (for 2017) of the cosmic energy gravitational genesis of the strongest (in 2017) Greek earthquakes occurred near the calculated date $t_{*}(\tau_{c,r}, 2017) = 2017.3$ (corresponding approximately to 20 April, 2017) related with the minimal (in 2017) combined planetary and solar integral energy gravitational influence (9) on the internal rigid core $\tau_{c,r}$ of the Earth. Section 3.3 presents the confirmed validity (for 2017) of the cosmic energy gravitational genesis of the strongest (in 2017) Chinese earthquakes occurred near the calculated date $t^{*}(\tau_{c,r}, 2017) = 2017.85$ (corresponding approximately to 7 November, 2017) related with the maximal (in 2017) combined planetary and solar integral energy gravitational influence (8) on the internal rigid core $\tau_{c,r}$ of the Earth. Section 3.4 presents the confirmed validity (for 2008) of the established [2] cosmic energy gravitational genesis of the strongest (in 2008) Chinese earthquakes occurred on May 12, 2008 (in Eastern Sichuan, China) near the calculated date $t_{*}(\tau_{c,r}, 2008) = 2008.5166$ related with the minimal (in 2008) combined planetary and solar integral energy gravitational influence (9) on the internal rigid core $\tau_{c,r}$ of the Earth. Section 3.5 presents the confirmed validity (for 2015) of the thermohydrogravidynamic theory concerning the cosmic energy gravitational genesis of the strongest (in 2015) intensifications of the global and Chilean seismotectonic processes in 2015 near the calculated date $t^{*}(\tau_{c,r}, 2015) = 2015.6833$ corresponding to the maximal (in 2015) combined planetary and solar integral energy gravitational influence (8) on the internal rigid core $\tau_{c,r}$ of the Earth.

In Section 4 we present the main results and conclusions.

2. Materials and Methods

2.1. The Generalized Differential Formulation of the First Law of Thermodynamics

Based on the general equation of continuum movement [15], the classical differential formulation [16] of the first law of thermodynamics for the one-component macrodifferential continuum element with no chemical reactions, the decomposition $\mathbf{P} = p\boldsymbol{\delta} + \boldsymbol{\Pi}$ [16] for the pressure tensor $\mathbf{P} = -\mathbf{T}$ [15], the viscous-stress tensor $\boldsymbol{\Pi}$ [16] and the symmetric stress tensor $\mathbf{T}$ [15] ($\boldsymbol{\delta}$ is the Kronecker delta-tensor, p is the thermodynamic pressure), we derived the generalized differential formulation (for individual finite continuum region τ considered in a Galilean frame of reference with respect to a Cartesian coordinate system *K* shown on Fig. 1) of the first law of thermodynamics [2-4, 7-12, 14, 17]:

$$dU_{\tau} + dK_{\tau} + d\pi_{\tau} = \delta Q + \delta A_{np,\partial\tau} + dG \tag{1}$$

where δQ is the classical [15, 16, 18, 19] infinitesimal change of heat across the continuum boundary surface $\partial\tau$ of the continuum region τ, dU_{τ} is the classical [15, 16, 18, 19] infinitesimal change of the internal thermal energy U_τ, dK_τ is the established [2-4, 7-12, 14, 17] infinitesimal increment of the macroscopic kinetic energy K_τ [14, 20] of the continuum region τ, $d\pi_\tau$ is the established [2-4, 7-12, 14, 17] infinitesimal increment of the gravitational potential energy π_τ determined by the potential ψ of the combined (cosmic and terrestrial) non-stationary gravitational field, $\delta A_{np\partial\tau}$ is the generalized [2-4, 7-12, 14, 17] infinitesimal work done by non-potential terrestrial stress forces acting on the continuum boundary surface $\partial\tau$ of the continuum region τ,

$$dG = dt \iiint_\tau \frac{\partial \psi}{\partial t} \rho dV \tag{2}$$

is the established [2-4, 7-12, 17] infinitesimal combined (cosmic and terrestrial) non-stationary energy gravitational influence on the continuum region τ during the infinitesimal time interval dt. The relation (2) for dG takes into account the partial derivative $\partial\psi/\partial t$ of the potential ψ of the combined (cosmic and terrestrial) non-stationary gravitational field, the local mass density ρ of the differential volume dV in the continuum region τ.

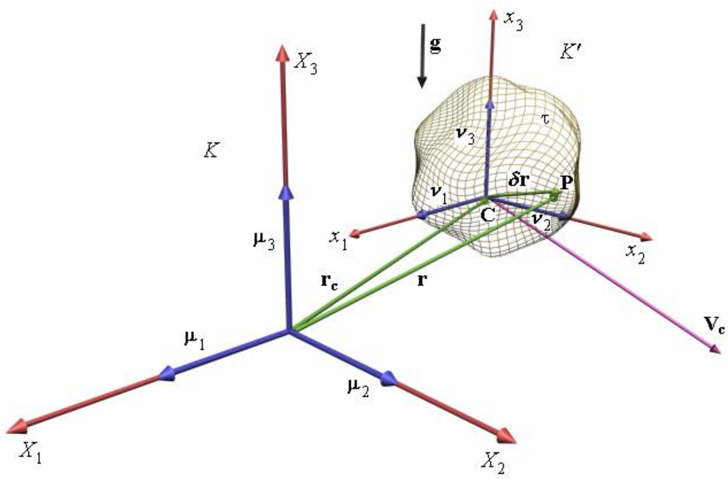

Figure 1. *Cartesian coordinate system K of a Galilean frame of reference and an individual finite continuum region τ subjected to the non-stationary combined (cosmic and terrestrial) Newtonian gravitation field and non-potential terrestrial stress forces.*

The established [2-4, 7-12, 17] infinitesimal combined (cosmic and terrestrial) non-stationary energy gravitational influence (2) (of the generalized differential formulation (1) of the first law of thermodynamics and) results to the following relation:

$$dG = dt \iiint_\tau \frac{\partial \psi}{\partial t} \rho dV = -dt \iint_{\partial\tau} (\mathbf{J}_g \cdot \mathbf{n}) d\Omega_{\mathbf{n}} \tag{3}$$

which is the theoretical foundation [3, 4, 9-11] of the power $\mathbf{J}_g$ of the gravitational energy (of the detected [1] non-relativistic classical gravitational waves [1, 2, 3, 4, 9-11] propagating from the focal regions of earthquakes and from the boundary region

τ_{rf} [9-11] between the internal rigid core $\tau_{c,r}$ and the fluid core $\tau_{c,f}$ of the Earth) across the surface element $d\Omega_{\mathbf{n}}$ determined by the external normal unit vector $\mathbf{n}$. The theoretical foundation (3) is based on the relation [3, 4, 9-11] for the divergence $\operatorname{div}\mathbf{J}_g$:

$$\operatorname{div}\mathbf{J}_g = -\rho\frac{\partial\psi}{\partial t} \tag{4}$$

2.2. The Global Prediction Thermohydrogravidynamic Principles Determining the Maximal Temporal Intensifications the Global Natural (Seismotectonic, Volcanic, Climatic and Magnetic) Processes of the Earth

We use the generalized differential formulation (1) of the first law of thermodynamics for the internal rigid core $\tau_{c,r}$ of the Earth (in the considered non-catastrophic model [8, 9] of the cosmic geology of the Earth characterized by the absence of the jump of the velocity field on the continuum boundary surface $\partial\tau_{c,r}$ between the internal rigid core $\tau_{c,r}$ and the fluid core $\tau_{c,f}$ of the Earth):

$$dU(\tau_{c,r}) + dK(\tau_{c,r}) + d\boldsymbol{\pi}(\tau_{c,r}) = \delta Q(\partial\tau_{c,r}) + \delta A_{np}(\partial\tau_{c,r}) + dG(\partial\tau_{c,r}) \tag{5}$$

where $\delta Q(\tau_{c,r})$ is the classical [14-16, 18, 19] infinitesimal change of heat across the continuum boundary surface $\partial\tau_{c,r}$ of the internal rigid core $\tau_{c,r}$, $dU(\tau_{c,r})$ is the classical [14-16, 18, 19] infinitesimal change of the internal thermal energy $U(\tau_{c,r})$ of the internal rigid core $\tau_{c,r}$, $dK(\tau_{c,r})$ is the established [2-4, 7-12, 14, 17] infinitesimal increment of the total macroscopic kinetic energy $K(\tau_{c,r})$ [14, 20] of the internal rigid core $\tau_{c,r}$, $d\boldsymbol{\pi}(\tau_{c,r})$ is the established [2-4, 7-12, 14, 17] infinitesimal increment of the gravitational potential energy $\boldsymbol{\pi}(\tau_{c,r})$ (determined by the potential ψ of the combined cosmic and terrestrial non-stationary gravitational field) of the internal rigid core $\tau_{c,r}$, $\delta A_{np}(\partial\tau_{c,r})$ is the generalized [2-4, 7-12, 14, 17] infinitesimal work done by non-potential terrestrial stress forces (characterized by the symmetric stress tensor $\mathbf{T}$ [15]) acting on the continuum boundary surface $\partial\tau_{c,r}$ of the internal rigid core $\tau_{c,r}$,

$$dG(\tau_{c,r}) = dt\iiint\limits_{\tau_{c,r}}\frac{\partial\psi(\tau_{c,r})}{\partial t}\rho(\tau_{c,r})dV \equiv dG(\partial\tau_{c,r}) = -dt\iint\limits_{\partial\tau_{c,r}}(\mathbf{J}_g(\partial\tau_{c,r})\cdot\mathbf{n}(\partial\tau_{c,r}))d\Omega_{\mathbf{n}}(\partial\tau_{c,r}) \tag{6}$$

is the established [2-4, 7-12, 17] infinitesimal combined (cosmic and terrestrial) non-stationary energy gravitational influence on the internal rigid core $\tau_{c,r}$ during the infinitesimal time interval dt. The relation (6) for equality $dG(\tau_{c,r}) \equiv dG(\partial\tau_{c,r})$ takes into account the partial derivative $\frac{\partial\psi(\tau_{c,r})}{\partial t}$ of the potential $\psi(\tau_{c,r})$ of the combined (cosmic and terrestrial) non-stationary gravitational field in the internal rigid core $\tau_{c,r}$ of the Earth, the mass density $\rho_{c,r} \equiv \rho(\tau_{c,r}) = 12800\,kg\cdot m^{-3}$ [21] of the internal rigid core $\tau_{c,r}$, the power $\mathbf{J}_g(\partial\tau_{c,r})$ of the gravitational energy (of the non-relativistic classical gravitational waves generated from the internal rigid core $\tau_{c,r}$ of the Earth and from the boundary region τ_{rf} [9-11] between the internal rigid core $\tau_{c,r}$ and the fluid core $\tau_{c,f}$ of the Earth) across the surface element $d\Omega_{\mathbf{n}}(\partial\tau_{c,r})$ (of the continuum boundary surface $\partial\tau_{c,r}$) determined by the external normal unit vector $\mathbf{n}$. The equality (identity) $dG(\tau_{c,r}) \equiv dG(\partial\tau_{c,r})$ is based on the relation [3, 4, 9-11] for the divergence $\mathrm{div}\,\mathbf{J}_g$:

$$\mathrm{div}\,\mathbf{J}_g(\partial\tau_{c,r}) = -\rho(\tau_{c,r})\frac{\partial\psi(\tau_{c,r})}{\partial t} \tag{7}$$

Based on the generalized differential formulation (1) of the first law of thermodynamics (used for the internal rigid core $\tau_{c,r}$ of the Earth), we formulated [9-11, 22] the global prediction thermohydrogravidynamic principles determining the maximal temporal intensifications of the established [9-11, 22] thermohygrogravidynamic processes (in the internal rigid core $\tau_{c,r}$ and in the boundary region τ_{rf} between the internal rigid core $\tau_{c,r}$ and the fluid core $\tau_{c,f}$ of the Earth) subjected to the combined cosmic energy gravitational influence of the planets of the Solar System, the Moon and the Sun (owing to the gravitational interaction of the Sun with the outer large planets). We concluded [9-11, 22] (based on the generalized differential formulation (1) of the first law of thermodynamics used for the internal rigid core $\tau_{c,r}$ of the Earth) that the maximal intensifications of the established thermohygrogravidynamic processes are related with the corresponding maximal intensifications of the global and regional natural (seismotectonic, volcanic, climatic and magnetic) processes of the Earth.

The rigorous global prediction thermohydrogravidynamic principles (determining the maximal temporal intensifications near the time moments $t = t^*(\tau_{c,r})$ and $t = t_*(\tau_{c,r})$, respectively, of the thermohydrogravidynamic processes in the internal rigid core $\tau_{c,r}$ and in the boundary region τ_{rf} between the internal rigid core $\tau_{c,r}$ and the fluid core $\tau_{c,f}$ of the Earth) are formulated as follows [9-11, 22]:

$$\Delta G(\tau_{c,r}, t^*(\tau_{c,r})) = \max_t \int_{t_0}^{t} dt' \iiint_{\tau_{c,r}} \frac{\partial\psi_{comb}}{\partial t'}\rho_{c,r} dV \ - \text{local maximum for time moment } t^*(\tau_{c,r}) \tag{8}$$

and

$$\Delta G(\tau_{c,r}, t_*(\tau_{c,r})) = \min_t \int_{t_0}^{t} dt' \iiint_{\tau_{c,r}} \frac{\partial\psi_{comb}}{\partial t'}\rho_{c,r} dV \ - \text{local minimum for time moment } t_*(\tau_{c,r}) \tag{9}$$

The global prediction thermohydrogravidynamic principles (8) and (9) define the maximal and minimal combined cosmic integral energy gravitational influences ((8) and (9), respectively, for the time moments $t = t^*(\tau_{c,r})$ and $t = t_*(\tau_{c,r})$) on the considered internal rigid core $\tau_{c,r}$ (of the Earth) subjected to the combined cosmic integral energy gravitational influence of the planets of the Solar System, the Moon and the Sun (owing to the gravitational interaction of the Sun with the outer large planets).

3. Results and Discussion

3.1. The Confirmed Validity of the Thermohydrogravidynamic Theory Concerning the Strongest Intensifications of the Global Seismotectonic and Climatic Processes Since 1 September, 2016 and Before 31 January, 2017

To predict in advance (on 31 August, 2016 [11, 22]) the forthcoming ranges (since 1 September, 2016) of the forthcoming active intensifications of the global natural (seismotectonic, volcanic, climatic and magnetic) processes of the Earth since 1 September, 2016, we used [11, 22] the established [9-11, 22] global prediction thermohydrogravidynamic principle (8) determining the maximal temporal intensification near the time moments $t = t^*(\tau_{c,r})$ of the thermohydrogravidynamic processes [9-11, 22] in the internal rigid core $\tau_{c,r}$ and in the boundary region τ_{rf} between the internal rigid core $\tau_{c,r}$ and the fluid core $\tau_{c,f}$ of the Earth. We used [11, 22] the principle (8) to obtain (for the considered real planetary configurations of the Earth and the planets of the Solar System) the numerical time moment $t^*(\tau_{c,r}, 2016)$

$$t^*(\tau_{c,r}, 2016) = 2016.7666 \qquad (10)$$

corresponding to the maximal (in 2016) combined planetary (of the Mercury, Venus, Mars and Jupiter) and solar (due to the gravitational interactions of the Sun with the Jupiter, Saturn, Uranus and Neptune) integral energy gravitational influence (8) on the internal rigid core $\tau_{c,r}$ of the Earth. Based on the global prediction thermohydrogravidynamic principle (8) and considering the real planetary configurations of the Earth and the planets of the Solar System for 2016, we obtained (on 31 August, 2016 [22]) the numerical time moment (related with the maximal (in 2016) combined planetary and solar integral energy gravitational influence (8) on the internal rigid core $\tau_{c,r}$ of the Earth in 2016) (10), which corresponds approximately to 6 October, 2016.

Based on the global prediction thermohydrogravidynamic principle (8) used for the range (2004 ÷ 2015), we calculated [11, 22] the dates $t^*(\tau_{c,r}, (2004 + m))$ (m = 0, 1, …, 11) corresponding to the different local maxima (8) of the combined planetary and solar integral energy gravitational influences (for the real planetary configurations during the range (2004 ÷ 2015)) on the internal rigid core $\tau_{c,r}$ of the Earth.

Considering the range (2004 ÷ 2015) and analyzing the previous strongest earthquakes (occurred near the calculated dates $t^*(\tau_{c,r}, (2004 + m))$, m = 0, 1, …, 11), we calculated [11, 22] the probability

$$\Pr\left\{t_{e,\max,2016} \in (19\ \text{September} \div 23\ \text{October},\ 2016)\right\} = 0.416 \qquad (11)$$

of the forthcoming strongest earthquakes (and related [4, 7-13, 17, 22-25] strongest in 2016 volcanic, climatic and magnetic processes of the Earth) near the calculated numerical time moment $t^*(\tau_{c,r}, 2016) = 2016.7666$ during the calculated (on 31 August, 2016 [22]) range [11, 22]:

$$(19 \text{ September} \div 23 \text{ October, } 2016) \quad (12)$$

We concluded (on 7 November, 2016 [11]) that Hurricane Matthew produced the strongest devastating climatic (meteorological) activity during the predicted (in advance [22], on 31 August, 2016) range (12) of the probable strongest (in 2016 since 1 September, 2016) intensification (characterized by the probability (11)) of the global climatic (meteorological) activity of the Earth in 2016. According to the U.S. National Hurricane Center, Matthew was (on 30 September, 2016) the most powerful devastating hurricane in the Atlantic since the last Category 5 hurricane Felix observed in the Atlantic on September 2007. According to the U.S. National Hurricane Center, "Matthew's top sustained winds have risen from 115 mph (185 kph) to 125 mph (205 mph) in just a few hours early Thursday (on 6 October, 2016) as the storm continues to batter the central Bahamas" [26].

We established [11] the unquestionable fact that the date of 6 October, 2016 (when "Hurricane Matthew has gained new muscle over the Bahamas" [26]) is in the perfect agreement with the calculated (in advance [22], on 31 August, 2016) numerical time moment $t^*(\tau_{c,r}, 2016) = 2016.7666$ (corresponding approximately to 6 October, 2016) of the maximal (in 2016) combined planetary and solar integral energy gravitational influence (8) on the internal rigid core $\tau_{c,r}$ of the Earth (and on the Earth as a whole). We estimated [11] the probability of this perfect agreement (considered as casual coincidence) as the obvious very small numerical value $(1/365)\cdot(1/365)$, which means that this perfect agreement is not a casual coincidence. We considered [11] this perfect agreement as the convincing evidence of the validity of the established [9-11, 22] global prediction thermohydrogravidynamic principle (8) concerning the maximal intensifications of the global and regional climatic activities of the Earth. This perfect agreement may be considered as the convincing evidence of the reasonable applicability of the global prediction thermohydrogravidynamic principle (8) for prediction of the global devastating hurricane activity of the Earth in 2016. We considered [11] this perfect agreement as the convincing evidence of the cosmic (combined planetary and solar) energy gravitational genesis of the global and regional climatic (meteorological) processes of the Earth related with strong hurricanes.

We established [11] the unquestionable fact that the strongest (in 2016 since 1 September and before 7 November, 2016) climatic (meteorological) processes of the Earth (related with Hurricane Matthew) corresponds to the predicted (in advance [22], on 31 August, 2016 based on the analysis of the previous strongest earthquakes during the range (2004 ÷ 2015)) range (12) of the of probable strongest (in 2016 since 1 September, 2016) intensification (characterized by the probability (11)) of the global climatic (meteorological) activity of the Earth. We considered [11] this unquestionable fact as the convincing evidence of the Gutenberg's [13] idea that the seismic activity of the Earth is closely related with the climatic (meteorological) activity of the Earth.

The Table 1 presents the analysis for 2016 (m = 12) of the previous significant (according to the U.S. Geological Survey) earthquakes occurred in Japan on dates t_e near the calculated date $t^*(\tau_{c,r}, 2016) = 2016.7666$ corresponding to the maximal (in

2016) combined planetary and solar integral energy gravitational influence (8) on the internal rigid core $\tau_{c,r}$ of the Earth.

Table 1. *The analysis for 2016 (m = 12) of the previous significant (according to the U.S. Geological Survey) earthquakes occurred on dates* t_e *in Japan near the calculated date* $t^*(\tau_{c,r}, 2016) = 2016.7666$.

Magnitude M, Region	Date t_e of earthquake, in yr	Date $t^*(\tau_{c,r}, 2016) = 2016.7666$, in yr	$\Delta = \lvert t_e - t^*(\tau_{c,r}, 2016)\rvert$, in days
M = 5.9, 13 km NE of Daigo	December 28, 2016 = 2016.99332	2016.7666	82.8 days after the date $t^*(\tau_{c,r}, 2016)$
M = 6.9, 35 km ESE of Namie	November 21, 2016 = 2016.89082	2016.7666	45.37 days after the date $t^*(\tau_{c,r}, 2016)$
M = 6.1, 24 km ENE of Ishinomaki	November 11, 2016 = 2016.86344	2016.7666	35.37 days after the date $t^*(\tau_{c,r}, 2016)$
M = 6.2, 6 km S of Kurayoshi	October 21, 2016 = 2016.80749	2016.7666	14.93 days after the date $t^*(\tau_{c,r}, 2016)$
M = 6.2, 143km ESE of Katsuura	September 23, 2016 2016.72963	2016.7666	13.5 days before the date $t^*(\tau_{c,r}, 2016)$
M = 6.3, 71 km ENE of Iwo Jima	August 4, 2016 2016.594284	2016.7666	62.93 days before the date $t^*(\tau_{c,r}, 2016)$

We see (based on the Table 1) the recognized [11] unquestionable fact (which confirms the Gutenberg's [13] idea about the global seismic-climatic relation) that the powerful (6.2-magnitude according to the U.S. Geological Survey) earthquake (occurred on 23 September, 2016 about 143 km ESE of Katsuura according to the U.S. Geological Survey) and the powerful (6.2-magnitude according to the U.S. Geological Survey) earthquake (occurred on 21 October, 2016 about 6 km S of Kurayoshi according to the U.S. Geological Survey) were realized during the predicted (in advance [22], on 31 August, 2016) range (12) of the probable strongest intensifications (characterized by the corresponding probability (11)) of the global seismotectonic and climatic processes of the Earth in 2016 since 1 September, 2016. This fact demonstrates the reasonable applicability of the global prediction thermohydrogravidynamic principle (8) for prediction [11, 22] of the global seismotectonic activity of the Earth in 2016 (and for explanation of the seismotectonic activity of Japan for 2016).

Considering the range (2004 ÷ 2015) and analyzing the previous strongest earthquakes (occurred near the calculated dates $t^*(\tau_{c,r}, (2004+m))$, m = 0, 1, …, 11), we calculated [11, 22] the probability

$$\Pr\{t_{e,max,2016} \in (1\,\text{September} \div 10\,\text{November},\ 2016)\} = 0.75 \qquad (13)$$

of the forthcoming strongest earthquakes (and related [4, 7-13, 17, 22-25] strongest volcanic, climatic and magnetic processes of the Earth in 2016) near the calculated numerical time moment $t^*(\tau_{c,r}, 2016) = 2016.7666$ [11, 22] during the forthcoming range [11, 22]:

$$(1 \text{ September} \div 10 \text{ November}, \ 2016) \quad (14)$$

We established [11] the unquestionable facts that the powerful 6.6-magnitude (according to the U.S. Geological Survey) earthquake (which is the strongest Italian devastating earthquake in nearly 40 years) rocked (near 23.93 days after the date $t^*(\tau_{c,r}, 2016) = 2016.7666$) central Italy (near the Umbrian town of Norcia) on 30 October, 2016 (during the predicted (in advance [22], on 31 August, 2016) range (14) of the probable strongest intensifications (characterized by the corresponding probability $\Pr = 0.75$) of the global seismotectonic and climatic processes of the Earth in 2016 since 1 September, 2016), that confirms the reasonable applicability of the global prediction thermohydrogravidynamic principle (8) for prediction of the global seismotectonic activity of the Earth in 2016 (and for explanation of the regional seismotectonic activity of Italy for 2016).

Considering (on 7 November, 2016 [11]) the range (2004 ÷ 2015) and analyzing (the previous strongest earthquakes (occurred near the calculated dates $t^*(\tau_{c,r}, (2004+m))$, m= 0, 1, …, 11), we calculated (on 7 November, 2016 [11]) the following probabilities [11]

$$\Pr\{t_{e,max,2016} \in (10 \text{ August} \div 30 \text{ November}, \ 2016)\} = 0.833 \quad (15)$$

$$\Pr\{t_{e,max,2016} \in (28 \text{ June}, 2016 \div 13 \text{ January}, \ 2017)\} = 0.916 \quad (16)$$

$$\Pr\{t_{e,max,2016} \in (15 \text{ June}, 2016 \div 26 \text{ January}, \ 2017)\} = 0.99 \quad (17)$$

of the forthcoming strongest earthquakes (and related [4, 7-13, 17, 22-25] strongest (in 2016 and in the beginning of 2017) volcanic, climatic and magnetic processes of the Earth) near the numerical time moment $t^*(\tau_{c,r}, 2016) = 2016.7666$ [11, 22] during the following calculated (on 7 November, 2016 [11]) ranges:

$$(10 \text{ August} \div 30 \text{ November}, \ 2016) \quad (18)$$

$$(28 \text{ June}, 2016 \div 13 \text{ January}, \ 2017) \quad (19)$$

$$(15 \text{ June}, 2016 \div 26 \text{ January}, \ 2017) \quad (20)$$

We see (based on the Table 1) that the strongest (in 2016) 6.9-magnitude Japanese earthquake (occurred on November 21, 2016 near 45.37 days after the date $t^*(\tau_{c,r}, 2016) = 2016.7666$) belongs to the predicted (on 7 November, 2016 [11]) range (18) characterized by the probability (15), that confirms the reasonable applicability of the global prediction thermohydrogravidynamic principle (8) for prediction (and explanation) of the strongest regional seismotectonic activity of Japan for 2016. We see (based on the Table 1) that the strongest (in 2016) 6.9-magnitude Japanese earthquake (occurred on November 21, 2016) corresponds to the reasonably good difference $\Delta = |t_e - t^*(\tau_{c,r}, 2016)| =$ 45.37 days, that confirms the reasonable applicability of the global prediction thermohydrogravidynamic principle (8) for prediction of the global seismotectonic activity of the Earth in 2016 and for prediction of the regional seismotectonic activity of Japan for 2016. We see (based on the Table

1) that that the 6.3-magnitude Japanese earthquake (occurred on August 4, 2016 near 62.93 days before the date $t^*(\tau_{c,r}, 2016) = 2016.7666$) belongs to the predicted [11] range (19) characterized by the probability (16). We see (based on the Table 1) that that the 5.9-magnitude Japanese earthquake (occurred on December 28, 2016 near 82.8 days after the date $t^*(\tau_{c,r}, 2016) = 2016.7666$) belongs to the predicted (on 7 November, 2016 [11]) range (19) characterized by the probability (16), that confirms the reasonable applicability of the global prediction thermohydrogravidynamic principle (8) for prediction of the global seismotectonic activity of the Earth in 2016 (and for prediction of the regional seismotectonic activity of Japan for 2016).

The Table 2 presents the analysis for 2016 (m = 12) of the previous strongest (according to the U.S. Geological Survey) earthquakes (characterized by magnitudes $M \geq 6.9$) of the Earth occurred on dates t_e near the calculated date $t^*(\tau_{c,r}, 2016) = 2016.7666$ (corresponding to the maximal (in 2016) combined planetary and solar integral energy gravitational influence (8) on the internal rigid core $\tau_{c,r}$ of the Earth) during the predicted [11] strongest intensifications of the global natural processes of the Earth since 1 September, 2016 [11] and before 26 January, 2017 [11]. Considering the significant (according to the U.S. Geological Survey) earthquakes of the Earth in 2016 before 9 December, 2016, we saw (on 18 December, 2016 [11]) that the predicted (in advance, on 7 November, 2016 [11]) range (18) (of the probable strongest (in 2016) intensifications of the global seismotectonic and climatic processes of the Earth since 1 September, 2016) contains the date (13 November, 2016) of the strongest 7.8-magnitude (according to the U.S. Geological Survey) earthquake (which struck the New Zealand near 37.37 days after the date $t^*(\tau_{c,r}, 2016) = 2016.7666$ according to the Table 2), that confirms the reasonable applicability of the global prediction thermohydrogravidynamic principle (8) for prediction of the global seismotectonic activity of the Earth in 2016 (and for explanation of the seismotectonic activity of the New Zealand for 2016).

We see (based on the Table 2) that the predicted (in advance, on 7 November, 2016 [11]) range (19) (of the probable strongest (in 2016 and 2017) intensifications of the global seismotectonic and climatic processes of the Earth since 1 September, 2016) contains (along with the strongest 7.8-magnitude earthquake occurred on 13 November, 2016) the date (8 December, 2016) of the strongest 7.8-magnitude (according to the U.S. Geological Survey) earthquake (which struck the Solomon Islands near 62.93 days after the date $t^*(\tau_{c,r}, 2016) = 2016.7666$), that confirms the reasonable applicability of the global prediction thermohydrogravidynamic principle (8) for prediction of the strongest intensifications of the global seismotectonic activity of the Earth since 1 September, 2016 [11] and before 26 January, 2017 [11] (and for explanation of the seismotectonic activity near the Solomon Islands for 2016).

We see (based on the Table 2) that the strongest 7.9-magnitude earthquake (which struck the Papua New Guinea on 17 December, 2016 near 72.26 days after the date $t^*(\tau_{c,r}, 2016) = 2016.7666$) and the strongest 7.6-magnitude earthquake (which struck the Chile on 25 December, 2016 near 79.81 days after the date $t^*(\tau_{c,r}, 2016) = 2016.7666$) belong to the predicted (in advance, on 7 November, 2016 [11]) range (19) (characterized by the corresponding probability $Pr = 0.916$ of the strongest (in 2016 and 2017) intensifications of the global seismotectonic and climatic processes of the Earth since 1 September, 2016), that confirms the reasonable applicability of the global prediction thermohydrogravidynamic principle (8) for prediction of the global seismotectonic activity of the Earth in 2016 (and for explanation of the seismotectonic activity in the Papua New Guinea and Chile for 2016).

Table 2. *The analysis for 2016 (m = 12) of the previous strongest (according to the U.S. Geological Survey) earthquakes (characterized by magnitudes* $M \geq 6.9$*) of the Earth occurred on dates* t_e *near the calculated [11] date* $t^*(\tau_{c,r}, 2016) = 2016.7666$.

Magnitude M, Region	Date t_e of earthquake, in yr	Date $t^*(\tau_{c,r}, 2016)$ $= 2016.7666$, in yr	$\Delta = \left\| t_e - t^*(\tau_{c,r}, 2016) \right\|$, in days
M = 7.9, 35 km WNW of Panguna, Papua New Guinea	January 22, 2017 $= 2017.060232$	2016.7666	107.24 days after the date $t^*(\tau_{c,r}, 2016)$
M = 7.3, 189 km SSE of Tabiauan, Philippines	January 10, 2017 $= 2017.027378$	2016.7666	95.24 days after the date $t^*(\tau_{c,r}, 2016)$
M = 6.9, 226 km SW of Nadi, Fiji	January 3, 2017 $= 2017.008213$	2016.7666	88.24 days after the date $t^*(\tau_{c,r}, 2016)$
M = 7.6, 41 km SW of Puerto Quellon, Chile	December 25, 2016 $= 2016.985112$	2016.7666	79.81 days after the date $t^*(\tau_{c,r}, 2016)$
M = 7.9, 54 km E of Taron, Papua New Guinea	December 17, 2016 $= 2016.964447$	2016.7666	72.26 days after the date $t^*(\tau_{c,r}, 2016)$
M = 6.9, 92 km WSW of Kirakira, Solomon Islands	December 9, 2016 $= 2016.941307$	2016.7666	63.81 days after the date $t^*(\tau_{c,r}, 2016)$
M = 7.8, 69 km WSW of Kirakira, Solomon Islands	December 8, 2016 $= 2016.938911$	2016.7666	62.93 days after the date $t^*(\tau_{c,r}, 2016)$
M = 6.9, 156 km SSW of Puerto El Triunfo, El Salvador	November 24, 2016 $= 2016.899041$	2016.7666	48.37 days after of the date $t^*(\tau_{c,r}, 2016)$
M = 6.9, 35 km ESE of Namie, Japan	November 21, 2016 $= 2016.89082$	2016.7666	45.37 days after of the date $t^*(\tau_{c,r}, 2016)$
M = 7.8, 54 km NNE of Amberley, New Zealand	November 13, 2016 $= 2016.72963$	2016.7666	37.37 days after the date $t^*(\tau_{c,r}, 2016)$
M =6.9, 107 km NNE of Ndoi Island, Fiji	September 24, 2016 $= 2016.732375$	2016.7666	12.5 days before the date $t^*(\tau_{c,r}, 2016)$
M =7.0, 175 km NE of Gisborne, New Zealand	September 1, 2016 $= 2016.6694045$	2016.7666	35.5 days before the date $t^*(\tau_{c,r}, 2016)$

We see (based on the Table 2) that the strongest 7.9-magnitude earthquake (which struck the Papua New Guinea on 22 January, 2017 near 107.24 days after the date $t^*(\tau_{c,r}, 2016) = 2016.7666$) belongs to the predicted (in advance, on 7 November, 2016 [11]) range (20) (characterized by the corresponding probability $\Pr = 0.99$ of the strongest intensifications of the global seismotectonic and climatic processes of the Earth since 1 September, 2016 and before 26 January, 2017), that confirms the reasonable applicability of the global prediction thermohydrogravidynamic principle (8) for prediction of the global seismotectonic activity of the Earth in 2016 and 2017 (and for explanation of the seismotectonic activity of the Papua New Guinea for 2016 and 2017).

Analyzing (on 10 April, 2017 [27]) the seismotectonic activity of the Earth in 2017 since 31 January, 2017 and before 10 April, 2017 (by considering the significant earthquakes according to the U.S. Geological Survey), we established [27] the absence of the strong earthquakes (characterized by the magnitudes $M \geq 7.0$) in the range from 31 January, 2017 to 10 April, 2017, that confirms the reasonable applicability of the global prediction thermohydrogravidynamic principle (8) for prediction [11] of the strongest intensifications of the global seismotectonic activity of the Earth since 1 September, 2016 [11] and before 26 January, 2017 [11].

There are no significant earthquakes (according to the U.S. Geological Survey) in China and Greece for 2016. We shall consider in the next sections the global predictions [27-29] of the seismotectonic activity of the Earth for 2017. We shall consider the relation of this prediction with the Greek and Chinese seismotectonic activity for 2017.

3.2. The Confirmed Validity for 2017 of the Cosmic Energy Gravitational Genesis of the Strongest (in 2017) Greek Earthquakes

We presented [27, 28] the confirmed validity of the prediction of the thermohydrogravidynamic theory concerning the predicted [27, 28] first subrange of the strongest intensifications of the global natural processes of the Earth in 2017 since 10 April, 2017 and before 6 August, 2017. We presented [27] the confirmed validity of the cosmic gravitational genesis of the predicted [27] intensifications of global natural processes since 10 April, 2017 and before 6 August, 2017. The main aim of this Section 3.2 is to presents the confirmed validity (for 2017) of the cosmic energy gravitational genesis of the significant (in 2017 according to the U.S. Geological Survey) Greek earthquakes occurred near the calculated [27, 28] date $t_*(\tau_{c,r}, 2017) = 2017.3$ (corresponding approximately to 20 April, 2017) related with the minimal (in 2017) combined planetary and solar integral energy gravitational influence (9) on the internal rigid core $\tau_{c,r}$ of the Earth.

We made (on 10 April, 2017) the prediction [27, 28] of the global prediction thermohydrogravidynamic principle (9) concerning the first subrange of the strongest intensifications of the global natural processes of the Earth in 2017 since 10 April, 2017 and before 16 July, 2017. Then we made (on 16 July, 2017) the predictions (40) for the Transylvanian Review [28] and for the American Journal of Earth Sciences [27]. We predicted [27, 28] (on 10 April, 2017) the forthcoming strongest intensifications of the global natural processes of the Earth (since 10 April, 2017 and before 16 July, 2017) determined by the minimal (near 20 April, 2017) combined planetary and solar integral energy gravitational influence (9) on the internal rigid core $\tau_{c,r}$ of the Earth. To do this prediction [27, 28], we used (for the numerical computation based on the considered real planetary configurations of the Earth and the planets of the Solar System) the established [9-11, 22] global prediction thermohydrogravidynamic principle (9) determining the maximal temporal intensification near the time moment $t = t_*(\tau_{c,r})$ of the thermohydrogravidynamic processes [9-11, 22] in the internal rigid core $\tau_{c,r}$ and in the boundary region τ_{rf} between the internal rigid core $\tau_{c,r}$ and the fluid core $\tau_{c,r}$ of the Earth. We calculated [27, 28] the numerical time moment (which corresponds approximately to 20 April, 2017):

$$t_*(\tau_{c,r}, 2017) = 2017.3 \tag{21}$$

related with the minimal (in 2017) combined planetary (of the Mercury, Venus, Mars and Jupiter) and solar (due to the gravitational interactions of the Sun with the Jupiter, Saturn, Uranus and Neptune) integral energy gravitational influence (9) on the considered internal rigid core $\tau_{c,r}$ (of the Earth). Considering the range (2004 ÷ 2016), we calculated [11, 22] (based on the global prediction thermohydrogravidynamic principle (9)) the dates $t_*(\tau_{c,r}, (2004+m))$ (m = 0, 1, …, 12) corresponding to the different local minimal values (9) of the combined planetary and solar integral energy gravitational influences (for the real planetary configurations during the range (2004 ÷ 2016)) on the internal rigid core $\tau_{c,r}$ of the Earth.

Analyzing the previous strongest earthquakes (occurred near the calculated dates $t_*(\tau_{c,r}, (2004+m))$, m = 0, 1, …, 12) during the range (2004 ÷ 2016), we calculated (on 10 April, 2017) [27, 28] the probability

$$\Pr\left\{t_{e,\min,2017} \in (16\ \text{April} \div 24\ \text{April},\ 2017)\right\} = 0.153 \tag{22}$$

of the strongest earthquakes (and related [4, 7-13, 17, 22-25] strongest volcanic, climatic and magnetic processes) near the calculated numerical time moment $t_*(\tau_{c,r}, 2017) = 2017.3$ during the calculated range [27, 28]:

$$(16\ \text{April} \div 24\ \text{April},\ 2017) \tag{23}$$

Analyzing the previous strongest earthquakes (occurred near the calculated dates $t_*(\tau_{c,r}, (2004+m))$, m = 0, 1, …, 12) during the range (2004 ÷ 2016), we calculated (on 10 April, 2017) [27, 28] the probability

$$\Pr\left\{t_{e,\min,2017} \in (11\ \text{April} \div 29\ \text{April},\ 2017)\right\} = 0.23 \tag{24}$$

of the strongest earthquakes (and related [4, 7-13, 17, 22-25] strongest volcanic, climatic and magnetic processes) near the calculated numerical time moment $t_*(\tau_{c,r}, 2017) = 2017.3$ during the calculated range [27, 28]:

$$(11\ \text{April} \div 29\ \text{April},\ 2017) \tag{25}$$

Analyzing the previous strongest earthquakes (occurred near the calculated dates $t_*(\tau_{c,r}, (2004+m))$, m = 0, 1, …, 12) during the range (2004 ÷ 2016), we calculated (on 10 April, 2017) [27, 28] the following probabilities

$$\Pr\left\{t_{e,\min,2017} \in (2\ \text{April} \div 8\ \text{May},\ 2017)\right\} = 0.307 \tag{26}$$

$$\Pr\left\{t_{e,\min,2017} \in (13\ \text{March} \div 28\ \text{May},\ 2017)\right\} = 0.46 \tag{27}$$

of the strongest earthquakes (and related [4, 7-13, 17, 22-25] strongest volcanic, climatic and magnetic processes of the Earth determined by the minimal (in 2017) combined planetary and solar integral energy gravitational influence (9) on the internal rigid core $\tau_{c,r}$ of the Earth) near the calculated [27, 28] numerical time moment $t_*(\tau_{c,r}, 2017) = 2017.3$ during the calculated [27, 28] following ranges:

$$(2\ \text{April} \div 8\ \text{May},\ 2017) \quad (28)$$

$$(13\ \text{March} \div 28\ \text{May},\ 2017) \quad (29)$$

Analyzing the previous strongest earthquakes (occurred near the calculated dates $t_*(\tau_{c,r}, (2004+m))$, m = 0, 1, …, 12) during the range (2004 ÷ 2016), we calculated (on 10 April, 2017) [27, 28] the following probabilities

$$\Pr\{t_{e,min,2017} \in (3\ \text{March} \div 7\ \text{June},\ 2017)\} = 0.538 \quad (30)$$

$$\Pr\{t_{e,min,2017} \in (1\ \text{March} \div 9\ \text{June},\ 2017)\} = 0.615 \quad (31)$$

$$\Pr\{t_{e,min,2017} \in (24\ \text{February} \div 14\ \text{June},\ 2017)\} = 0.769 \quad (32)$$

$$\Pr\{t_{e,min,2017} \in (19\ \text{February} \div 19\ \text{June},\ 2017)\} = 0.846 \quad (33)$$

$$\Pr\{t_{e,min,2017} \in (23\ \text{January} \div 16\ \text{July},\ 2017)\} = 0.923 \quad (34)$$

of the strongest earthquakes (and related [4, 7-13, 17, 22-25] strongest (in 2017) volcanic, climatic and magnetic processes of the Earth determined by the minimal (in 2017) combined planetary and solar integral energy gravitational influence (9) on the internal rigid core $\tau_{c,r}$ of the Earth) near the calculated [27, 28] numerical time moment $t_*(\tau_{c,r}, 2017) = 2017.3$ during the calculated [27, 28] following ranges:

$$(3\ \text{March} \div 7\ \text{June},\ 2017) \quad (35)$$

$$(1\ \text{March} \div 9\ \text{June},\ 2017) \quad (36)$$

$$(24\ \text{Februaru} \div 14\ \text{June},\ 2017) \quad (37)$$

$$(19\ \text{Februaru} \div 19\ \text{June},\ 2017) \quad (38)$$

$$(23\ \text{Januaru} \div 16\ \text{July},\ 2017) \quad (39)$$

Analyzing the previous strongest earthquakes (occurred near the calculated dates $t_*(\tau_{c,r}, (2004+m))$, m = 0, 1, …, 12) during the range (2004 ÷ 2016), we calculated (on 16 July, 2017) the probability [27, 28]

$$\Pr\{t_{e,min,2017} \in (2\ \text{January} \div 6\ \text{August},\ 2017)\} = 0.99 \quad (40)$$

of the strongest (in 2017) earthquakes (and related [4, 7-13, 17, 22-25] strongest (in 2017) volcanic, climatic and magnetic processes) near the calculated [27, 28] numerical time moment $t_*(\tau_{c,r}, 2017) = 2017.3$ during the calculated (on 16 July, 2017 [27, 28]) range (of the strongest (in 2017) intensifications of the global natural processes of the Earth since 10 April, 2017 and before 6 August, 2017):

$$(2\ \text{January} \div 6\ \text{August},\ 2017) \quad (41)$$

Table 3 presents the analysis for 2017 of the previous significant (according to the U.S. Geological Survey) earthquakes occurred in Greece near the calculated date $t_*(\tau_{c,r}, 2017) = 2017.3$ corresponding to the minimal (in 2017) combined planetary and solar integral energy gravitational influence (9) on the internal rigid core $\tau_{c,r}$ of the Earth.

Table 3. *The analysis for 2017 of the previous significant (according to the U.S. Geological Survey) earthquakes occurred in Greece on dates* t_e *near the calculated date* $t_*(\tau_{c,r}, 2017) = 2017.3$.

Magnitude M, Region	Date t_e of earthquake, in yr	Date $t_*(\tau_{c,r}, 2017) = 2017.3$, in yr	$\Delta = \left\| t_e - t_*(\tau_{c,r}, 2017) \right\|$, in days
M = 6.6, 11 km ENE of Kos, Greece	July 20, 2017 $= 2017.554757$	2017.3	93.04 days after the date $t_*(\tau_{c,r}, 2017)$
M = 6.3, 5 km S of Plomarion, Greece	June 12, 2017 $= 2017.449520$	2017.3	54.6 days after the date $t_*(\tau_{c,r}, 2017)$

We see (based on the Table 3) the first unquestionable fact that the powerful (strongest 6.6-magnitude according to the U.S. Geological Survey) earthquake (occurred on July 20, 2017 about 11 km ENE of Kos, Greece according to the U.S. Geological Survey) was realized near 93.04 days after the date $t_*(\tau_{c,r}, 2017) = 2017.3$. We see (based on the Table 3) the second unquestionable fact that the powerful (6.3-magnitude according to the U.S. Geological Survey) earthquake (occurred on June 12, 2017 about 5 km S of Plomarion, Greece according to the U.S. Geological Survey) was realized near 54.6 days after the date $t_*(\tau_{c,r}, 2017) = 2017.3$. This facts demonstrate the reasonable applicability of the global prediction thermohydrogravidynamic principle (9) for prediction of the global seismotectonic activity of the Earth in 2017 [27, 28] and for explanation of the strongest (in 2017) seismotectonic activity in Greece for 2017.

We see (based on the Table 3) the third unquestionable fact that the powerful (6.6-magnitude according to the U.S. Geological Survey) earthquake (occurred on July 20, 2017 about 11 km ENE of Kos, Greece according to the U.S. Geological Survey) was realized during the predicted (in advance [27, 28], on 16 July, 2017) range (41) of the probable strongest intensifications (characterized by the corresponding probability $Pr = 0.99$ (given by (40)) of the global seismotectonic and climatic processes of the Earth. We see (based on the Table 3) the fourth unquestionable fact (that the powerful (6.3-magnitude according to the U.S. Geological Survey) earthquake (occurred on June 12, 2017 about 5 km S of Plomarion, Greece according to the U.S. Geological Survey) was realized during the predicted (in advance [27, 28], on 10 April, 2017) range (37) of the probable strongest intensifications (characterized by the corresponding probability $Pr = 0.769$ (given by (32)) of the global seismotectonic and climatic processes of the Earth. These facts demonstrate the reasonable applicability of the global prediction thermohydrogravidynamic principle (9) for explanation of the strongest (in 2017) seismotectonic activity in Greece for 2017. This facts confirm the cosmic energy gravitational genesis of the strongest (in 2017) Greek earthquakes occurred near the calculated (in advance, on 10 April, 2017 [27, 28]) date

$t_*(\tau_{c,r}, 2017) = 2017.3$ (corresponding approximately to 20 April, 2017) related with the minimal (in 2017) combined planetary and solar integral energy gravitational influence (9) on the internal rigid core $\tau_{c,r}$ of the Earth.

3.3. The Cosmic Energy Gravitational Genesis of the Significant Chinese Earthquakes Since 18 July, 2017 and Before 26 February, 2018

We presented [27, 29] the confirmed validity of the prediction of the thermohydrogravidynamic theory concerning the predicted [27, 29] second subrange of the strongest intensifications of the global natural processes of the Earth since 18 July, 2017 and before 26 February, 2018. We presented [27, 29] the confirmed validity of the cosmic energy gravitational genesis of the predicted [27, 29] intensifications of global natural processes of the Earth since 18 July, 2017 and before 26 February, 2018. The main aim of this Section 3.3 is to presents the confirmed validity (for 2017) of the cosmic energy gravitational genesis of the significant (since 18 July, 2017 and before 12 February, 2018 according to the U.S. Geological Survey) Chinese earthquakes occurred on dates t_e near the calculated date $t^*(\tau_{c,r}, 2017) = 2017.85$ (corresponding approximately to 7 November, 2017) related with the maximal (in 2017) combined planetary and solar integral energy gravitational influence (8) on the internal rigid core $\tau_{c,r}$ of the Earth.

To predict [27, 29] in advance the forthcoming ranges of the active forthcoming intensifications of the global natural (seismotectonic, volcanic, climatic and magnetic) processes of the Earth in 2017 since 18 July, 2017 and before 26 February, 2018 [27, 29], we used [27, 29] the established [9-11, 22] global prediction thermohydrogravidynamic principle (8) determining the maximal temporal intensification near the time moment $t = t^*(\tau_{c,r})$ of the thermohydrogravidynamic processes [9-11, 22] in the internal rigid core $\tau_{c,r}$ and in the boundary region τ_{rf} between the internal rigid core $\tau_{c,r}$ and the fluid core $\tau_{c,f}$ of the Earth. We used [27, 29] the principle (8) to obtain (for the considered real planetary configurations of the Earth and the planets of the Solar System) the numerical time moment $t^*(\tau_{c,r}, 2017)$ corresponding to the maximal (in 2017) combined planetary and solar integral energy gravitational influence (8) on the internal rigid core $\tau_{c,r}$ of the Earth. Based on the global prediction thermohydrogravidynamic principle (8) and considering the real planetary configurations of the Earth and the planets of the Solar System for 2017, we obtained (on 10 April, 2017 [27, 29]) the numerical time moment (related with the maximal combined planetary (of the Mercury, Venus, Mars and Jupiter) and solar (due to the gravitational interactions of the Sun with the Jupiter, Saturn, Uranus and Neptune) integral energy gravitational influence (8) on the Earth in 2017):

$$t^*(\tau_{c,r}, 2017) = 2017.85 \qquad (42)$$

which corresponds approximately to 7 November, 2017. Based on the global prediction thermohydrogravidynamic principle (8) used for the range (2004 ÷ 2016), we calculated [11, 22] the dates $t^*(\tau_{c,r}, (2004 + m))$ ($m = 0, 1, \ldots, 12$) corresponding to the different local maxima (8) of the combined planetary and solar integral energy gravitational influences (for the real planetary configurations during the range (2004 ÷ 2016)) on the Earth.

Considering the range (2004 ÷ 2016) and analyzing the previous strongest earthquakes (occurred near the calculated dates $t^*(\tau_{c,r},(2004+m))$, m= 0, 1, …, 12), we calculated (on 10 April, 2017) the following probabilities [27, 29]

$$\Pr\{t_{e,max,2017} \in (5\ \text{November} \div 9\ \text{November},\ 2017)\} = 0.077 \quad (43)$$

$$\Pr\{t_{e,max,2017} \in (4\ \text{November} \div 10\ \text{November},\ 2017)\} = 0.154 \quad (44)$$

$$\Pr\{t_{e,max,2017} \in (3\ \text{November} \div 11\ \text{November},\ 2017)\} = 0.23 \quad (45)$$

$$\Pr\{t_{e,max,2017} \in (29\ \text{October} \div 17\ \text{November},\ 2017)\} = 0.307 \quad (46)$$

$$\Pr\{t_{e,max,2017} \in (22\ \text{October} \div 23\ \text{November},\ 2017)\} = 0.384 \quad (47)$$

$$\Pr\{t_{e,max,2017} \in (13\ \text{October} \div 1\ \text{December},\ 2017)\} = 0.461 \quad (48)$$

$$\Pr\{t_{e,max,2017} \in (12\ \text{October} \div 2\ \text{December},\ 2017)\} = 0.538 \quad (49)$$

$$\Pr\{t_{e,max,2017} \in (6\ \text{October} \div 8\ \text{December},\ 2017)\} = 0.692 \quad (50)$$

$$\Pr\{t_{e,max,2017\text{-}2018} \in (12\ \text{September},\ 2017 \div 1\ \text{January},\ 2018)\} = 0.769 \quad (51)$$

$$\Pr\{t_{e,max,2017\text{-}2018} \in (1\ \text{August},\ 2017 \div 12\ \text{February},\ 2018)\} = 0.846 \quad (52)$$

$$\Pr\{t_{e,max,2017\text{-}2018} \in (22\ \text{July},\ 2017 \div 22\ \text{February},\ 2018)\} = 0.923 \quad (53)$$

$$\Pr\{t_{e,max,2017\text{-}2018} \in (18\ \text{July},\ 2017 \div 26\ \text{February},\ 2018)\} = 0.99 \quad (54)$$

of the forthcoming strongest earthquakes (and related [4, 7-13, 17, 22-25] strongest volcanic, climatic and magnetic processes in 2017 since 18 July, 2017 and before 26 February, 2018) near the numerical time moment $t^*(\tau_{c,r}, 2017) = 2017.85$ corresponding approximately to 7 November, 2017) during the following calculated (on 10 April, 2017 [27]) ranges [27, 29]:

$$(5\ \text{November} \div 9\ \text{November},\ 2017) \quad (55)$$

$$(4\ \text{November} \div 10\ \text{November},\ 2017) \quad (56)$$

$$(3\ \text{November} \div 11\ \text{November},\ 2017) \quad (57)$$

$$(29\ \text{October} \div 17\ \text{November},\ 2017) \quad (58)$$

$$(22\ \text{October} \div 23\ \text{November},\ 2017) \quad (59)$$

$$(13\ \text{October} \div 1\ \text{December},\ 2017) \quad (60)$$

$$(12\ \text{October} \div 2\ \text{December},\ 2017) \quad (61)$$

$$(6\ \text{October} \div 8\ \text{December},\ 2017) \quad (62)$$

$$(12\ \text{September},\ 2017 \div 1\ \text{January},\ 2018) \quad (63)$$

$$(1\ \text{August},\ 2017 \div 12\ \text{February},\ 2018) \quad (64)$$

$$(22\ \text{July},\ 2017 \div 22\ \text{February},\ 2018) \quad (65)$$

$$(18 \text{ July}, 2017 \div 26 \text{ February}, 2018) \qquad (66)$$

We concluded [27, 29] that the dates $t_{e,max,2017}$ and $t_{e,max,2017\text{-}2018}$ of the forthcoming strongest earthquakes (and related [4, 7-13, 17, 22-25] strongest volcanic, climatic and magnetic processes of the Earth determined by the maximal combined planetary and solar integral energy gravitational influence (8) on the internal rigid core $\tau_{c,r}$ of the Earth in 2017 near the numerical time moment $t^*(\tau_{c,r}, 2017) = 2017.85$ corresponding approximately to 7 November, 2017) will occur during the ranges (55), (56), (57), (58), (59), (60), (61), (62), (63), (64), (65) and (66) characterized by the probabilities (43), (44), (45), (46), (47), (48), (49), (50), (51), (52), (53) and (54), correspondingly.

These ranges (55) - (66) and the corresponding probabilities (43) - (54) were founded exceptionally (by eliminating the analysis of the strongest global climatic activity of the Earth during the range (2004 ÷2016)) based on the combined analysis of the dates of the previous strongest earthquakes occurred during the range (2004÷2016) near the calculated dates $t^*(\tau_{c,r}, (2004 + m))$ (m = 0, 1, … , 12) corresponding to the different local maxima (8) of the combined planetary and solar integral energy gravitational influences (related with the real planetary configurations during the range (2004 ÷2017)) on the internal rigid core $\tau_{c,r}$ of the Earth.

To demonstrate the confirmed validity [27, 29] of the thermohydrogravidynamic theory concerning the predicted [27, 29] second subrange of the strongest intensifications of the global natural processes of the Earth since 18 July, 2017 and before 26 February, 2018, we present the Table 4 containing the analysis (finished on February 12, 2018) for 2017 (m = 13) of the previous strongest (since 18 July, 2017 and before February 12, 2018 according to the U.S. Geological Survey) earthquakes (characterized by magnitudes $M \geq 6.9$) of the Earth occurred on dates t_e near the calculated [27, 29] date $t^*(\tau_{c,r}, 2017) = 2017.85$ (related with the maximal (in 2017) combined planetary and solar integral energy gravitational influence (8) on the internal rigid core $\tau_{c,r}$ of the Earth) during the predicted [27, 29] range (since 18 July, 2017 [27, 29] and before 26 February, 2018 [27, 29]) of the strongest intensifications of the global seismotectonic processes of the Earth.

Table 4. *The analysis for 2017 (m = 13) of the previous strongest (since 18 July, 2017 and before February 12, 2018 according to the U.S. Geological Survey) earthquakes (characterized by magnitudes* $M \geq 6.9$*) of the Earth occurred on dates* t_e *near the calculated [27, 29] date*

$$t^*(\tau_{c,r}, 2017) = 2017.85.$$

Magnitude M, Region	Date t_e of earthquake, in yr	Date $t^*(\tau_{c,r}, 2017)$ $= 2017.85$, in yr	$\Delta = \left\| t_e - t^*(\tau_{c,r}, 2017) \right\|$, in days
M = 7.9, 280 km SE of Kodiak, Alaska	January 23, 2018 $= 2018.06297$	2017.85	77.78 days after the date $t^*(\tau_{c,r}, 2017)$
M = 7.1, 37 km SSW of Acari, Peru	January 14, 2018 $= 2018.038329$	2017.85	68.78 days after the date $t^*(\tau_{c,r}, 2017)$

M = 7.5, 44 km E of Great Swan Island, Honduras	January 10, 2018 $=2018.027378$	2017.85	64.78 days after the date $t^*(\tau_{c,r}, 2017)$
M = 7.0, 85 km ENE of Tadine, New Caledonia	November 19, 2017 $=2017.885352$	2017.85	12.91 days after the date $t^*(\tau_{c,r}, 2017)$
M = 7.3, 29 km S of Halabjah, Iraq	November 12, 2017 $=2017.866187$	2017.85	5.91 days after the date $t^*(\tau_{c,r}, 2017)$
M = 7.1, 1 km E of Ayutla, Mexico	September 19, 2017 $=2017.718685$	2017.85	47.96 days before the date $t^*(\tau_{c,r}, 2017)$
M = 8.2, 101 km SSW of Tres Picos, Mexico	September 8, 2017 $=2017.688569$	2017.85	58.96 days before the date $t^*(\tau_{c,r}, 2017)$

To demonstrate the confirmed validity for 2017 of the cosmic energy gravitational genesis of the significant (in 2017) Chinese earthquakes since 18 July, 2017 and before 12 February, 2018, we present the Table 5 containing the analysis for 2017 (m = 13) of the previous significant (according to the U.S. Geological Survey) earthquakes occurred in China on dates t_e near the calculated date $t^*(\tau_{c,r}, 2017) = 2017.85$ (corresponding approximately to 7 November, 2017 related with the maximal (in 2017) combined planetary and solar integral energy gravitational influence (8) on the internal rigid core $\tau_{c,r}$ of the Earth) during the predicted [27, 29] range (since 18 July, 2017 [27, 29] and before 26 February, 2018 [27, 29]) of the strongest intensifications of the global seismotectonic processes of the Earth.

We use the following simple approximate relations (for date $x \in (1, 2, ..., 31)$ and for year $j \in (2008, 2015, 2016, 2017)$:

$$\text{January } x, j = j + x/365.25 \tag{67}$$

$$\text{February } x, j = j + 1/12 + x/365.25 \tag{68}$$

$$\text{March } x, j = j + 2/12 + x/365.25 \tag{69}$$

$$\text{April } x, j = j + 3/12 + x/365.25 \tag{70}$$

$$\text{May } x, j = j + 4/12 + x/365.25 \tag{71}$$

$$\text{June } x, j = j + 5/12 + x/365.25 \tag{72}$$

$$\text{July } x, j = j + 6/12 + x/365.25 \tag{73}$$

$$\text{August } x, j = j + 7/12 + x/365.25 \tag{74}$$

$$\text{September } x, j = j + 8/12 + x/365.25 \tag{75}$$

$$\text{October } x, j = j + 9/12 + x/365.25 \tag{76}$$

$$\text{November } x,\ j = j + 10/12 + x/365.25 \quad (77)$$

$$\text{December } x,\ j = j + 11/12 + x/365.25 \quad (78)$$

for prompt calculation of the dates t_e (given in yr in the considered Tables 1, 2, 3, 4, 5, 6 and 7) for the considered significant (according to the U.S. Geological Survey) earthquakes and for prompt calculation of the corresponding differences $\Delta = \left| t_e - t^*(\tau_{c,r}, j) \right|$ (given in days with the error of ±1.5 day in the presented Tables 1 (for j = 2016), 2 (for j = 2017), 3 (for j = 2017), 4 (for j = 2017), 5 (for j = 2017), 6 (for j = 2008) and 7 (for j = 2015).

We see (based on the Table 5) the first unquestionable fact that the powerful (strongest since 18 July, 2017 and before 12 February, 2018) Chinese 6.5-magnitude (according to the U.S. Geological Survey) earthquake (occurred on August 8, 2017 about 36 km WSW of Yongle, China according to the U.S. Geological Survey) was realized near 89.4 days before the date $t^*(\tau_{c,r}, 2017) = 2017.85$. We see (based on the Table 5) the second unquestionable fact that the powerful Chinese (6.4-magnitude according to the U.S. Geological Survey) earthquake (occurred on November 17, 2017 about 63 km ENE of Nyingchi, China according to the U.S. Geological Survey) was realized near 10.91 days after the date $t^*(\tau_{c,r}, 2017) = 2017.85$. These facts demonstrate the reasonable applicability of the global prediction thermohydrogravidynamic principle (8) for explanation of the global seismotectonic activity of the Earth in 2017 and for explanation of the strongest (in 2017) seismotectonic activity in China for 2017.

Table 5. *The analysis for 2017 (m = 13) of the previous significant (since 18 July, 2017 and before 12 February, 2018 according to the U.S. Geological Survey) earthquakes occurred in China on dates* t_e *near the calculated [27, 29] date* $t^*(\tau_{c,r}, 2017) = 2017.85$.

Magnitude M, Region	Date t_e of earthquake, in yr	Date $t^*(\tau_{c,r}, 2017) = 2017.85$, in yr	$\Delta = \left| t_e - t^*(\tau_{c,r}, 2017) \right|$, in days
M = 6.4, 63 km ENE of Nyingchi, China	November 17, 2017 $= 2017.879876$	2017.85	10.91 days after the date $t^*(\tau_{c,r}, 2017)$
M = 6.5, 36 km WSW of Yongle, China	August 8, 2017 $= 2017.605236$	2017.85	89.4 days before the date $t^*(\tau_{c,r}, 2017)$

We see (based on the Table 5) the third unquestionable fact that the powerful (6.5-magnitude according to the U.S. Geological Survey) earthquake (occurred on August 8, 2017 about 36 km WSW of Yongle, China according to the U.S. Geological Survey) was realized during the predicted (on 10 April, 2017 [27]) range (64) of the probable strongest intensifications (characterized by the corresponding probability $Pr = 0.846$ (given by (52)) of the global seismotectonic and climatic processes of the Earth. We see (based on the Table 5) the fourth unquestionable fact that the powerful (6.4-magnitude according to the U.S. Geological Survey) earthquake (occurred on November 17, 2017 about 63 km ENE of Nyingchi, China according to the U.S. Geological Survey) was realized during the predicted (on 10 April, 2017 [27]) range (58) of the probable strongest intensifications (characterized by the corresponding probability $Pr = 0.307$ (given by (46)) of the global seismotectonic and climatic processes of the Earth. These facts demonstrate the reasonable applicability of the global prediction thermohydrogravidynamic principle (8) for explanation of the strongest (in 2017) seismotectonic activity in China for 2017. This facts confirm the cosmic energy gravitational genesis of the significant (in 2017 according to the U.S. Geological Survey) Chinese earthquakes occurred near the calculated (on 10 April, 2017 [27]) date $t^{*}(\tau_{c,r}, 2017) = 2017.85$ (corresponding approximately to 7 November, 2017) related with the maximal (in 2017) combined planetary and solar integral energy gravitational influence (8) on the internal rigid core $\tau_{c,r}$ of the Earth.

3.4. The Validity for 2008 of the Thermohydrogravidynamic Theory Concerning the Cosmic Energy Gravitational Genesis of the Strongest (in 2008) Intensifications of the Global and Chinese Seismotectonic Processes

We established [2] the cosmic energy gravitational genesis of the strongest Chinese (for 2008) and Japanese (for 2011) earthquakes. The aim of this Section 3.4 is to present the additional confirmed validity (for 2008) of the cosmic energy gravitational genesis of the strongest (in 2008 according to the U.S. Geological Survey) Chinese earthquake occurred on dates t_e near the calculated date $t_*(\tau_{c,r}, 2008) = 2008.5166$ related with the minimal (in 2008) combined planetary and solar integral energy gravitational influence (9) on the internal rigid core $\tau_{c,r}$ of the Earth. To do this, we present the Table 6 containing the analysis for 2008 of the previous strongest (according to the U.S. Geological Survey) earthquakes (characterized by magnitudes $M \geq 7.7$) of the Earth occurred in 2008 on dates t_e near the calculated date $t_*(\tau_{c,r}, 2008) = 2008.5166$ corresponding to the minimal (in 2008) combined planetary and solar integral energy gravitational influence (9) on the internal rigid core $\tau_{c,r}$ of the Earth.

Table 6. *The analysis for 2008 of the previous strongest (according to the U.S. Geological Survey) earthquakes (characterized by magnitudes* $M \geq 7.7$ *) of the Earth occurred in 2008 on dates* t_e *near the calculated date* $t_*(\tau_{c,r}, 2008) = 2008.5166$.

Magnitude M, Region	Date t_e of earthquake, in yr	Date $t_*(\tau_{c,r}, 2008)$ $= 2008.5166$, in yr	$\Delta = \left\| t_e - t_*(\tau_{c,r}, 2008) \right\|$, in days
M=7.7, Sea of Okhotsk	July 5, 2008 $= 2008.5136$	2008.5166	1.06 days before the date $t_*(\tau_{c,r}, 2008)$
M = 7.9, Eastern Sichuan, China	May 12, 2008 $= 2008.36618$	2008.5166	54.94 days before the date $t_*(\tau_{c,r}, 2008)$

We see (based on the Table 6) the first unquestionable fact that the first strongest (in 2008 according to the U.S. Geological Survey) 7.9-magnitude Chinese earthquake (occurred on May 12, 2008 in Eastern Sichuan, China according to the U.S. Geological Survey) was realized near 54.94 days before the date $t_*(\tau_{c,r}, 2008) = 2008.5166$ corresponding to the minimal (in 2008) combined planetary and solar integral energy gravitational influence (9) on the internal rigid core $\tau_{c,r}$ of the Earth. The first fact demonstrates the reasonable applicability of the global prediction thermohydrogravidynamic principle (9) for the additional confirmation of the established [2] cosmic energy gravitational genesis of the strongest Chinese earthquakes in 2008.

We see (based on the Table 6) the second unquestionable fact that the second strongest (in 2008 according to the U.S. Geological Survey) 7.7-magnitude (according to the U.S. Geological Survey) earthquake (occurred on July 5, 2008 in the Sea of Okhotsk according to the U.S. Geological Survey) was realized near 1.06 days before the date $t_*(\tau_{c,r}, 2008) = 2008.5166.$ This facts demonstrate the reasonable applicability of the global prediction thermohydrogravidynamic principle (9) for explanation of the strongest global seismotectonic activity of the Earth in 2008 and for explanation of the strongest (in 2008) seismotectonic activity in China for 2008.

3.5. The Validity for 2015 of the Thermohydrogravidynamic Theory Concerning the Cosmic Energy Gravitational Genesis of the Strongest (in 2015) Intensifications of the Global and Chilean Seismotectonic Processes

Taking into account the confirmed [11] cosmic energy gravitational genesis of the strongest intensifications of the global and Chilean seismotectonic processes in 2016 (according to the Table 2) during the predicted [11] range since 1 September, 2016 [11] and before 26 January, 2017 [11] (near the calculated [11] date $t^*(\tau_{c,r}, 2016) = 2016.7666$ corresponding to the maximal (in 2016) combined planetary and solar integral energy gravitational influence (8) on the internal rigid core $\tau_{c,r}$ of the Earth), the aim of this Section 3.5 is to consider the strongest (according to the U.S. Geological Survey) earthquakes (characterized by magnitudes $M \geq 7.6$) of the Earth in 2015 near the calculated date $t^*(\tau_{c,r}, 2015) = 2015.6833$ corresponding to the maximal (in 2015) combined planetary and solar integral energy gravitational influence (8) on the internal rigid core $\tau_{c,r}$ of the Earth. The aim of this Section 3.5 is determined also by the fact that the date 14 September, 2015 is related with “the first direct detection of gravitational waves [30], designated as GW150914” [31]. The aim of this Section 3.5 is related also with the nontrivial question: what is the planetary condition of the “first direct detection of gravitational waves [30]” [31] “almost exactly after 100 years” [32] (after Albert Einstein “presented his general relativity (GR) to the Prussian Academy on 25 November 1915 (ref. 4)” [32]) “on 14 September 2015” [32]?

To confirm the cosmic energy gravitational genesis of the strongest intensifications of the global and Chilean seismotectonic processes in 2015, we present the Table 7 containing the analysis for 2015 of the previous strongest (according to the U.S. Geological Survey) earthquakes (characterized by magnitudes $M \geq 7.6$) of the Earth occurred in 2015 on dates t_e near the calculated date $t^*(\tau_{c,r}, 2015) = 2015.6833$ corresponding to the maximal (in 2015) combined planetary and solar integral energy gravitational influence (8) on the internal rigid core $\tau_{c,r}$ of the Earth.

Table 7. *The analysis for 2015 (m = 11) of the previous strongest (according to the U.S. Geological Survey) earthquakes (characterized by magnitudes* $M \geq 7.6$*) of the Earth occurred in 2015 on dates* t_e *near the calculated date* $t^*(\tau_{c,r}, 2015) = 2015.6833.$

Magnitude M, Region	Date t_e of earthquake, in yr	Date $t^*(\tau_{c,r}, 2015) = 2015.6833$, in yr	$\Delta = \left\|t_e - t^*(\tau_{c,r}, 2015)\right\|$, in days
M=7.6, 211 km S of Tarauaca, Brazil	November 24, 2015 $= 2015.899041$	2015.6833	78.79 days after the date $t^*(\tau_{c,r}, 2015)$

M=7.6, 173 km WNW of Iberia, Peru	November 24, 2015 $=2015.899041$	2015.6833	78.79 days after the date $t^*(\tau_{c,r}, 2015)$
M=**8.3**, 48 km W of Illapel, Chile	September 16, 2015 $=2015.710472$	2015.6833	9.92 days after the date $t^*(\tau_{c,r}, 2015)$
M = 7.8, 189 km WNW of Chichi-shima, Japan	May 30, 2015 $=2015.415468$	2015.6833	97.82 days before the date $t^*(\tau_{c,r}, 2015)$
M = 7.8, 36 km E of Khudi, Nepal	April 25, 2015 $=2015.318446$	2015.6833	133.26 days before the date $t^*(\tau_{c,r}, 2015)$

We see (based on the Table 7) that the first unquestionable fact that the strongest (in 2015) 8.3-magnitude (according to the U.S. Geological Survey) earthquake (occurred on September 16, 2015 about 48 km W of Illapel, Chile according to the U.S. Geological Survey) was realized near 9.92 days after the date $t^*(\tau_{c,r}, 2015) = 2015.6833$ corresponding to the maximal (in 2015) combined planetary and solar integral energy gravitational influence (8) on the internal rigid core $\tau_{c,r}$ of the Earth. This fact demonstrates the reasonable applicability of the global prediction thermohydrogravidynamic principle (8) for explanation of the strongest (in 2015) global and Chilean seismotectonic processes in 2015. This fact confirms also the cosmic energy gravitational genesis of the strongest (in 2015 according to the U.S. Geological Survey) 8.3-magnitude Chilean earthquake (occurred on September 16, 2015 about 48 km W of Illapel, Chile) realized near 9.92 days after the date $t^*(\tau_{c,r}, 2015) = 2015.6833$ corresponding to the maximal (in 2015) combined planetary and solar integral energy gravitational influence (8) on the internal rigid core $\tau_{c,r}$ of the Earth. We see also the second unquestionable fact that the date (September 16, 2015) of the strongest (in 2015 according to the U.S. Geological Survey) 8.3-magnitude Chilean earthquake (realized near 9.92 days after the date $t^*(\tau_{c,r}, 2015) = 2015.6833$) is near the date (September 14, 2015) of the first direct detection [31, 32] of gravitational waves "designated as GW150914" [31]. It was pointed out [32] that "this transient event called GW150914 has been hailed as the greatest physics discovery of the century and the biggest progress in astronomy since Galileo Galilei's observation of the sky" [32].

Taking into account the presented above facts, we can consider the possibility of the real influence of the cosmic planetary configuration (of the Earth, the planets of the Solar System and the Sun on September 14, 2015 near the date $t^*(\tau_{c,r}, 2015) = 2015.6833$ corresponding approximately to September 6, 2015) on the realization of the first direct detection [31, 32] of gravitational waves (on September 14, 2015 [31, 32]) owing to following previously published [10] rigorous mathematical and physical arguments. Based on the relation (4), we derived [10] in 2014 the following equation (determining the time evolution of the gravitational energy in the three-dimensional physical space due to the combined effects of the energy flux $\mathbf{J_g} \neq 0$ of the gravitational energy and the local density gradient $\nabla\rho \neq 0$):

$$\frac{\partial\psi}{\partial t} + \mathrm{div}(\psi \mathbf{v}_{ge}) = -\frac{(\mathbf{J_g} \cdot \nabla\rho)}{\rho^2} \equiv s_{ge}(\mathbf{r}, t) \quad (79)$$

where $\mathbf{v}_{ge} = \frac{\mathbf{J_g}}{\rho\psi}$ is the velocity of propagation of the gravitational energy, $\rho\psi$ is the macroscopic potential energy per unit volume, $s_{ge}(\mathbf{r}, t)$ is the space-time source of distributed production of the gravitational energy per unit volume and per unit time. We established [10] that the derived equation (79) for the non-stationary gravitational potential ψ is analogous to the generalized hydrodynamic continuity equation (for the local macroscopic density ρ of mass distribution and the local hydrodynamic velocity $\mathbf{v}$ of the macroscopic velocity field)

$$\frac{\partial \rho}{\partial t} + \mathrm{div}\,(\rho \mathbf{v}) = s_m(\mathbf{r}, t) \tag{80}$$

generalizing the classical hydrodynamic continuity equation (considered usually under condition $s_m(\mathbf{r}, t) \equiv 0$) by taking into account the function $s_m(\mathbf{r}, t) \neq 0$ determining the space-time source $s_m(\mathbf{r}, t)$ of distributed mass output per unit volume and per unit time. We pointed out [10] that the non-stationary gravitational potential ψ (the macroscopic potential energy per unit mass of the continuum) is analogous to the local non-stationary macroscopic density ρ (the macroscopic mass per unit volume of the continuum). The velocity $\mathbf{v}_{ge} = \frac{\mathbf{J_g}}{\rho\psi}$ of propagation of the gravitational energy is analogous [10] to the local hydrodynamic velocity $\mathbf{v}$ of the macroscopic velocity field. The space-time source $s_m(\mathbf{r}, t)$ of distributed mass output per unit volume and per unit time is analogous [10] to the space-time source $s_{ge}(\mathbf{r}, t)$ of distributed production of the gravitational energy per unit volume and per unit time.

We concluded [10] that the obtained equation (79) for the non-stationary gravitational potential ψ (the macroscopic potential energy per unit mass of the continuum) means that the strong density gradients $\nabla\rho \neq 0$ inside of the continuum of the Earth (especially, in the heterogeneous boundary region τ_{rf} between the internal rigid core $\tau_{c,r}$ of the Earth and the fluid core $\tau_{c,f}$ of the Earth) are related with the sources $s_{ge}(\mathbf{r}, t) \neq 0$ of distributed production of the gravitational energy radiating under the oscillatory motion [9-11] of the rigid core $\tau_{c,r}$ of the Earth relative to the fluid core $\tau_{c,f}$ of the Earth owing to planetary and lunar energy gravitational influences on the Earth [2, 7, 8-11] and owing to the energy gravitational influences of the Sun on the Earth [4, 9-11] determined by the gravitational interaction of the Sun with the outer large planets (Jupiter, Saturn, Uranus and Neptune) of the Solar System. We concluded [10] that the gravitational disturbances radiating from the heterogeneous regions (especially, from the heterogeneous boundary region τ_{rf} between the internal rigid core $\tau_{c,r}$ of the Earth and the fluid core $\tau_{c,f}$ of the Earth) should have the fundamental influence on the global seismotectonic, volcanic and climatic activity of the Earth. Taking into account the presented above facts, we cannot exclude the possibility of the real influence of the cosmic planetary configuration (of the Earth, the planets of the Solar System and the Sun on September 14, 2015 near the date $t^*(\tau_{c,r}, 2015) = 2015.6833$ corresponding to the maximal (in 2015) combined planetary and solar integral energy gravitational influence (8) on the internal rigid core $\tau_{c,r}$ of the Earth) on the realization of the first direct detection [31, 32] of gravitational waves. This possibility exists really since the generation of the classical [1, 2, 3, 4, 9-11] gravitational waves (by the boundary region τ_{rf} between the internal rigid core $\tau_{c,r}$ and the fluid core $\tau_{c,f}$ of the Earth) is more probable near the calculated date (corresponding approximately to September 6, 2015) $t^*(\tau_{c,r}, 2015) = 2015.6833$ (closely related with the strongest (in 2015) 8.3-magnitude Chilean earthquake occurred on September 16, 2015 near 9.92 days after the date $t^*(\tau_{c,r}, 2015) = 2015.6833$) according to the global prediction thermohydrogravidynamic principle (8) determining the maximal temporal intensifications of the global and regional natural (seismotectonic, volcanic, climatic and magnetic) processes of the Earth near the time moment $t^*(\tau_{c,r}, 2015) = 2015.6833$ (corresponding approximately to September 6, 2015 in the approximation of the circular orbits of the planets) related with the corresponding maximal temporal intensifications of the thermohydrogravidynamic processes (including the generation and propagation of the gravitational energy) in the internal rigid core $\tau_{c,r}$ and in the boundary region τ_{rf} between the internal rigid core $\tau_{c,r}$ and the fluid core $\tau_{c,f}$ of the Earth.

4. Conclusions

We have presented in Section 2 the established [2-4, 7-12, 17, 22-25, 27-29] generalized differential formulation (1) and of the first law of thermodynamics (for the individual finite continuum region τ (considered in the Galilean frame of reference) subjected to the cosmic and terrestrial non-stationary Newtonian gravitational field and non-potential terrestrial stress forces characterized by the symmetric stress tensor $\mathbf{T}$ [15]) and the established [9-11, 22] global prediction thermohydrogravidynamic principles (8) and (9) (of the cosmic seismology [9-11, 22]) determining the maximal temporal intensifications of the global and regional natural (seismotectonic, volcanic, climatic and magnetic) processes of the Earth.

We have presented in Section 3.1 the confirmed [11] validity of the prediction [11, 22] (based on the global prediction thermohydrogravidynamic principle (8) of the cosmic seismology [9-11, 22]) concerning the strongest intensifications of the global natural (seismotectonic and climatic) processes of the Earth (since 1 September, 2016 [11, 22] and before 26 January, 2017 [11]) near the calculated (in advance [22], on 31 August, 2016) numerical time moment $t^*(\tau_{c,r}, 2016) = 2016.7666$ corresponding approximately to 6 October, 2016. Based on the recognized [11] unquestionable facts that the powerful (6.2-magnitude according to the U.S. Geological Survey) earthquake (occurred on 23 September, 2016 about 143 km ESE of Katsuura) and the powerful (6.2-magnitude according to the U.S. Geological Survey) earthquake (occurred on 21 October, 2016 about 6 km S of Kurayoshi) were realized during the predicted (in advance [22], on 31 August, 2016) range (12) of the probable strongest intensifications (characterized by the corresponding probability (11)) of the global seismotectonic and climatic processes of the Earth since 1 September, 2016, we have demonstrated the reasonable applicability of the global prediction thermohydrogravidynamic principle (8) for explanation of the global seismotectonic activity of the Earth in 2016 (and especially for prediction of the seismotectonic activity of Japan for 2016).

Based on the confirmed validity [27, 28] of the thermohydrogravidynamic theory concerning the predicted [27, 28] first subrange of the strongest intensifications of the global natural processes of the Earth since 10 April, 2017 and before 6 August, 2017, we have presented in Section 3.2 the confirmed validity (for 2017) of the cosmic energy gravitational genesis of the strongest (in 2017) Greek earthquakes occurred (on July 20, 2017 about 11 km ENE of Kos and on June 12, 2017 about 5 km S of Plomarion, according to the U.S. Geological Survey) near the calculated [27, 28] date $t_*(\tau_{c,r}, 2017) = 2017.3$ (corresponding approximately to 20 April, 2017) related with the minimal (in 2017) combined integral energy gravitational influence (9) on the internal rigid core $\tau_{c,r}$ of the Earth (and on the Earth as a whole) of the planets (Mercury, Venus, Mars and Jupiter) and the Sun due to the gravitational interactions of the Sun with Jupiter Saturn, Uranus and Neptune.

Based on the confirmed validity of the prediction [27] of the thermohydrogravidynamic theory concerning the predicted [27] second subrange of the strongest intensifications of the global natural processes of the Earth since 18 July, 2017 and before 26 February, 2018, we have presented in Section 3.3 the confirmed validity (for 2017) of the cosmic energy gravitational genesis of the strongest (in 2017) Chinese earthquakes occurred (on August 8, 2017 about 36 km WSW of Yongle and on November 17, 2017 about 63 km ENE of Nyingchi, according to the U.S. Geological Survey) near the calculated [27] date $t^*(\tau_{c,r}, 2017) = 2017.85$ (corresponding approximately to 7 November, 2017) related with the maximal (in 2017) combined integral energy gravitational influence (8) on the internal rigid core $\tau_{c,r}$ of the Earth (and on the Earth as a whole) of the planets (Mercury, Venus, Mars and Jupiter) and the Sun due to the gravitational interactions of the Sun with Jupiter Saturn, Uranus and Neptune.

Based on the calculated date $t_*(\tau_{c,r}, 2008) = 2008.5166$ corresponding to the minimal (in 2008) combined planetary and solar integral energy gravitational influence (9) on the internal rigid core $\tau_{c,r}$ of the Earth, we have presented in Section 3.4 the confirmed validity (for 2008) of the cosmic energy gravitational genesis of the strongest (in 2008) earthquakes (characterized by magnitudes $M \geq 7.7$) of the Earth occurred (on May 12, 2008 in Eastern Sichuan, China and on July 5, 2008 in the Sea of Okhotsk, according to the U.S. Geological Survey) near the calculated date $t_*(\tau_{c,r}, 2008) = 2008.5166$ related with the minimal (in 2008) combined integral energy gravitational influence (9) on the internal rigid core $\tau_{c,r}$ of the Earth (and on the Earth as a whole) of the planets (Mercury, Venus, Mars and Jupiter) and the Sun due to the gravitational interactions of the Sun with Jupiter Saturn, Uranus and Neptune.

By considering (based on the Table 7) the strongest (according to the U.S. Geological Survey) earthquakes (characterized by magnitudes $M \geq 7.6$) of the Earth in 2015 near the calculated date $t^*(\tau_{c,r}, 2015) = 2015.6833$ (corresponding to the maximal (in 2015) combined planetary and solar integral energy gravitational influence (8) on the internal rigid core $\tau_{c,r}$ of the Earth), we have presented in Section

3.5 the confirmed validity (for 2015) of the cosmic energy gravitational genesis of the strongest (in 2015) intensifications of the global and Chilean seismotectonic processes (characterized by magnitudes $M \geq 7.6$) of the Earth near the calculated date $t^*(\tau_{c,r}, 2015) = 2015.6833$ corresponding to the maximal (in 2015) combined planetary and solar integral energy gravitational influence (8) on the internal rigid core $\tau_{c,r}$ of the Earth (and on the Earth as a whole) of the planets (Mercury, Venus, Mars and Jupiter) and the Sun due to the gravitational interactions of the Sun with Jupiter Saturn, Uranus and Neptune. We have shown (based on the Table 7) that the strongest (in 2015) 8.3-magnitude (according to the U.S. Geological Survey) Chilean earthquake (occurred on September 16, 2015 about 48 km W of Illapel, Chile according to the U.S. Geological Survey) was realized near 9.92 days after the date $t^*(\tau_{c,r}, 2015) = 2015.6833$, that confirms the cosmic energy gravitational genesis of the strongest (in 2015 according to the U.S. Geological Survey) 8.3-magnitude Chilean earthquake (occurred on September 16, 2015 about 48 km W of Illapel, Chile) related (according to the global prediction thermohydrogravidynamic principle (8)) with the maximal (near the calculated date $t^*(\tau_{c,r}, 2015) = 2015.6833$ obtained in the approximation of the circular orbits of the planets) combined planetary and solar integral energy gravitational influence (8) on the internal rigid core $\tau_{c,r}$ of the Earth (and on the Earth as a whole) of the planets (Mercury, Venus, Mars and Jupiter) and the Sun due to the gravitational interactions of the Sun with Jupiter Saturn, Uranus and Neptune.

Thus, we have presented the confirmed validity of the cosmic energy gravitational genesis of the strongest Japanese (for 2015 and 2016), Italian (for 2016), Greek (for 2017), Chinese (for 2008 and 2017) and Chilean (for 2015 and 2016) earthquakes related with the maximal and minimal (respectively) combined integral energy gravitational influences (8) and (9) (respectively, in accordance with the established [9-11, 22] global prediction thermohydrogravidynamic principles (8) and (9) of the cosmic seismology [9-11, 22]) on the internal rigid core $\tau_{c,r}$ of the Earth (and on the Earth as a whole) of the planets (Mercury, Venus, Mars and Jupiter) and the Sun due to the gravitational interactions of the Sun with Jupiter Saturn, Uranus and Neptune. Taking into account that the first direct detection [31, 32] of gravitational waves (on September 14, 2015 [30, 31, 32]) is located between the calculated date $t^*(\tau_{c,r}, 2015) = 2015.6833$ (corresponding approximately to September 6, 2015 of the maximal (in 2015) combined planetary and solar integral energy gravitational influence (8) on the internal rigid core $\tau_{c,r}$ of the Earth) and the date (September 16, 2015 according to the U.S. Geological Survey) of the strongest (in 2015 according to the U.S. Geological Survey) 8.3-magnitude Chilean earthquake (occurred near 9.92 days after the date $t^*(\tau_{c,r}, 2015) = 2015.6833$), we have founded the real possibility of influence of the cosmic planetary configuration (on September 14, 2015 during the first direct detection [30, 31, 32, 33] of gravitational waves) on the realization of the first direct detection [30, 31, 32, 33] of gravitational waves.

Conflicts of Interest

The author declares that there is no conflict of interest regarding the publication of this article.

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