The Confirmed Validity of the Explanatory Aspect of the Thermohydrogravidynamic Theory Concerning the Evaluated Maximal Magnitude of the Strongest Earthquake during the Considered Intensification of the Global Natural Processes from December 7, 2019 to April 18, 2020 AD

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Abstract

We present the confirmed validity of the significant explanatory aspect of the thermohydrogravidynamic theory (Simonenko, 2007, 2009, 2012-2020) concerning the evaluated (on April 7, 2021, especially for the presentation on the 11th International Conference on Geology and Geophysics) maximal magnitude $7.725$ of the possible most strongest earthquake during the considered (Simonenko, 2020) intensification of the global natural processes of the Earth from December 7, 2019 to April 18, 2020 AD. To obtain the satisfactory explanation of the maximal magnitude $M = 7.7$ (according to the U.S. Geological Survey) of the strongest earthquake occurred on January 28, 2020 AD (123 km NNW of Lucea, Jamaica) near the calculated (Simonenko, 2020) mean date (February 5, 2020 AD) of the probable most strongest earthquake during the considered (Simonenko, 2020) range from December 7, 2019 to April 18, 2020 AD, we have analyzed the strongest earthquakes of the Earth occurred near the calculated local maximal combined (planetary and solar) integral energy gravitational influences on the internal rigid core of the Earth.

Keywords

Thermohydrogravidynamic Theory, Non-Stationary Cosmic Gravitation, Generalized First Law of Thermodynamics, Cosmic Geology, Cosmic...
1. Introduction

The problem of the long-term predictions of the strong earthquakes (Richter, 1958) is the significant problem of the modern geophysics (Sgrigna & Conti, 2012). It was confirmed (Tinivella et al., 2013) in the special issue on “Geophysical Methods for Environmental Studies” of the International Journal of Geophysics that the article (Simonenko, 2013) “proposes a possible cosmic energy gravitational genesis of the strong Chinese 2008 and the strong Japanese 2011 earthquakes, based on the established generalized differential formulation of the first law of thermodynamics” (Tinivella et al., 2013).

Using the evaluated probabilities $P_{cor,i}$ (given by (37) in (Simonenko, 2020) for $i$ from $i = 9$ to $i = 22$), we calculated (on October 6, 2020, especially for the presentation on the 10th International Conference on Geology and Geophysics) the mean (defined statistically) theoretical date $t(2019, 2020) = 2020.0995139 = \text{February 5, 2020 AD}$ of the probable most strongest earthquake during the considered (Simonenko, 2019b, 2020) range from December 7, 2019 to April 18, 2020. We obtained (Simonenko, 2020) the reasonably small difference of 8 days between the calculated theoretical date (February 5, 2020 AD) and the real date (January 28, 2020 AD) of the most strongest (from December 7, 2019 to April 18, 2020) earthquake (characterized by the maximal magnitude $M = 7.7$) of the Earth occurred 123 km NNW of Lucea, Jamaica (according to the U.S. Geological Survey) during the considered (Simonenko, 2019b, 2020) range from December 7, 2019 to April 18, 2020 AD.

The main aim of this article is to present (in accordance with the author’s presentation on the 11th International Conference on Geology and Geophysics) the reasonable explanation (in the frame of the thermohydrogravidynamic theory (Simonenko, 2007, 2009, 2012-2020)) of the maximal magnitude $M = 7.7$ of the most strongest (from December 7, 2019 to April 18, 2020 AD) earthquake of the Earth occurred on January 28, 2020 AD (according to the U.S. Geological Survey) during the considered (Simonenko, 2019b, 2020) range from December 7, 2019 to April 18, 2020 AD.

In Section 2 we present the fundamentals of the thermohydrogravidynamic technology for evaluation of the maximal magnitude of the strongest earthquake of the Earth during the considered (Simonenko, 2019b, 2020) intensification of the global natural processes of the Earth from December 7, 2019 to April 18, 2020 AD. In Section 2.1 we present the established (Simonenko, 2006, 2007a, 2007b) generalized differential formulation (1) of the first law of thermodynamics. In Section 2.2 we present the established (Simonenko, 2012, 2014) global prediction thermohydrogravidynamic principles (6) and (7) determining the maximal temporal intensifications of the global and regional natural (seismo...
tectonic, volcanic, climatic and magnetic) processes of the Earth.

In Section 3 we present the explanation of the maximal magnitude $M = 7.7$ (according to the U.S. Geological Survey) of the strongest earthquake of the Earth occurred on January 28, 2020 AD during the considered (Simonenko, 2019b, 2020) range from December 7, 2019 to April 18, 2020 AD.

In Section 4 we present the main results and conclusions.

2. Fundamentals of the Thermohydrogravidynamic Technology for Evaluation of the Maximal Magnitude of the Strongest Earthquake of the Earth during the Considered Intensification of the Global Natural Processes of the Earth

2.1. The Generalized Differential Formulation of the First Law of Thermodynamics for Non-Stationary Newtonian Gravitation

The thermohydrogravidynamic technology of evaluation of the maximal magnitude of the strongest earthquake of the Earth (during the considered (Simonenko, 2019b, 2020) intensification of the global natural processes from December 7, 2019 to April 18, 2020 AD) is based on the established (Simonenko, 2006, 2007a, 2007b) generalized differential formulation of the first law of thermodynamics (for an individual finite continuum region $\tau$ subjected to the non-stationary Newtonian gravitation and to non-potential terrestrial stress forces characterized by the symmetric stress tensor $\mathbf{T}$):

$$
dU_i + dK_i + d\pi_i = \delta Q + \delta A_{\psi/\chi} + dG,
$$

where $dU_i$ is the differential change of the classical (De Groot and Mazur, 1962) microscopic internal thermal energy, $dK_i$ is the differential change of the established (Simonenko, 2004, 2006, 2007a, 2007b) instantaneous macroscopic kinetic energy, $d\pi_i$ is the established (Simonenko, 2006, 2007a, 2007b) differential change of the macroscopic potential gravitational energy related with the non-stationary total potential $\psi$ of the gravitational field characterized by the local gravity acceleration $g = -\nabla \psi$, $\delta Q$ is the classical (De Groot and Mazur, 1962) differential change of heat related with the thermal molecular conductivity of heat across the boundary surface $\partial \tau$ of the individual finite continuum region $\tau$, $\delta A_{\psi/\chi}$ is the established (Simonenko, 2006, 2007a, 2007b) generalized differential work done by non-potential stress forces acting on the boundary surface $\partial \tau$ of the individual finite continuum region $\tau$. We established (Simonenko, 2007a, 2007b) the significant differential energy gravitational influence

$$
dG = dt\int \int \int \frac{\partial \psi}{\partial t} \rho \, dV
$$

on the individual finite continuum region $\tau$ during the infinitesimal time interval $dt$, where $\rho$ is the local mass density, $dV$ is the differential of physical volume, $\frac{\partial \psi}{\partial t}$ is the partial time derivative of the gravitational potential $\psi$. The
generalized differential formulation (1) (Simonenko, 2006, 2007a) generalizes the classical (Gibbs, 1873; Landau and Lifshitz, 1976) formulations
\[ dU = \delta Q - pdV, \delta \varepsilon = dU, -\delta W = -pdV \] (3)
by taking into account the established (Simonenko, 2006, 2007a, 2007b) infinitesimal increment \( \delta K \) of the macroscopic kinetic energy \( K \), the established (Simonenko, 2006, 2007a, 2007b) infinitesimal increment \( \delta \pi \) of the gravitational potential energy \( \pi \), the established (Simonenko, 2006, 2007a, 2007b) generalized infinitesimal work \( np, \tau \delta A \) done on the individual finite continuum region \( \tau \) by the surroundings of \( \tau \), and the established (Simonenko, 2007a, 2007b, 2012, 2014) differential energy gravitational influence \( dG \) on the individual finite continuum region \( \tau \) as the result of the Newtonian non-stationary gravitation.

Introducing the energy flux \( J_g \) of the gravitational energy (per unit time and per unit area) across the differential surface element \( d\Omega \) characterized by the external normal unit vector \( n \), the relation for \( dG \) can be rewritten as follows (Simonenko, 2012, 2014)
\[ dG = d\int \int \frac{\partial \psi}{\partial t} pdV = -d\int \int (J_g \cdot n) d\Omega, \] (4)
where the flux \( J_g \) of the gravitational energy is determined by the relation (Simonenko, 2012, 2014):
\[ \rho \frac{\partial \psi}{\partial t} = -\text{div} J_g, \] (5)

### 2.2. The Global Prediction Thermohydrogravidynamic Principles

**Determining the Maximal Temporal Intensifications of the Global Natural Processes of the Earth**

The rigorous global prediction thermohydrogravidynamic principles are formulated (for the internal rigid core \( \tau_{c,r} \) of the Earth) based on the term (2) of the generalized differential formulation (1) of the first law of thermodynamics (Simonenko, 2007a, 2007b) as follows (Simonenko, 2012, 2014, 2016, 2018, 2019a, 2020):
\[ \Delta G(\tau_{c,r}, t^*(\tau_{c,r})) = \max_t \int_{t_0}^t \int_{\tau_{c,r}} \frac{\partial \psi_{comb}}{\partial t} \rho_{c,r} dV \] local maximum for time moment \( t^*(\tau_{c,r}) \), (6)
and
\[ \Delta G(\tau_{c,r}, t^*(\tau_{c,r})) = \min_t \int_{t_0}^t \int_{\tau_{c,r}} \frac{\partial \psi_{comb}}{\partial t} \rho_{c,r} dV \] local minimum for time moment \( t^*(\tau_{c,r}) \), (7)
where \( \rho_{c,r} \) is the mass density of the internal rigid core \( \tau_{c,r} \), \( \psi_{comb} = \psi_{comb}(\tau_{c,r},t) \) is the combined cosmic (planetary and solar) gravitational potential in the internal rigid core \( \tau_{c,r} \) of the Earth, \( \partial \psi_{comb}/\partial t = \partial \psi_{comb}(\tau_{c,r},t)/\partial t \) is the partial
time derivative of the combined cosmic gravitational potential \( \psi_{\text{comb}}(\tau_{c,r},t) \). The partial time derivative of the combined cosmic gravitational potential \( \psi_{\text{comb}}(\tau_{c,r},t) \) is approximated as follows

\[
\frac{\partial \psi_{\text{comb}}(\tau_{c,r},t)}{\partial t} = \sum_{i=1}^{3} \frac{\partial \psi_{3_i}(C_3,t)}{\partial t} + \sum_{j=5}^{8} \frac{\partial \psi_{5_j}(C_j,t)}{\partial t},
\]

where \( \frac{\partial \psi_{3_i}(C_3,t)}{\partial t} \) is the established partial time derivative (Simonenko, 2007, 2009, 2012, 2013) of the gravitational potential \( \psi_{3_i}(C_3,t) \) created (at the mass center \( C_3 \) of the Earth) by the significant planet \( \tau_i \) (\( i = 1 \) corresponds to Mercury, \( i = 2 \) corresponds to Venus, \( i = 4 \) corresponds to Mars and \( i = 5 \) corresponds to Jupiter); \( \frac{\partial \psi_{5_j}(C_j,t)}{\partial t} \) is the established (Simonenko, 2012, 2019a) partial time derivative of the gravitational potential \( \psi_{5_j}(C_j,t) \) created (at the mass center \( C_j \) of the Earth) by the Sun due to the gravitational interaction of the Sun with the outer large planet \( \tau_j \) (\( j = 5 \) corresponds to Jupiter, \( j = 6 \) corresponds to Saturn, \( j = 7 \) corresponds to Uranus) and \( j = 8 \) corresponds to Neptune).

3. Results and Discussions

We present in this Section 3 the thermohydrogravidynamic explanation of the maximal magnitude \( M = 7.7 \) (according to the U.S. Geological Survey) of the strongest earthquake of the Earth occurred on January 28, 2020 AD near the calculated (Simonenko, 2020) mean date (February 5, 2020 AD) of the probable most strongest earthquake during the considered (Simonenko, 2019b, 2020) range

\[
t(\tau_{c,r}, 2020) = 2020.016666667 AD
\]

related with the maximal combined planetary and solar integral energy gravitational influence (6) on the internal rigid core \( \tau_{c,r} \) of the Earth. This thermohydrogravidynamic explanation is made by means of evaluation of the range

\[
7.6593 \div 7.7908
\]

of the maximal magnitude of the possible most strongest earthquake of the Earth during the considered (Simonenko, 2019b, 2020) range (9) of intensification of the global natural processes of the Earth. Based on the thermohydrogravidynamic theory, we consider the Earth subjected to the combined planetary (Simonenko, 2007b, 2009, 2010, 2012, 2013, 2014, 2015, 2016, 2019a, 2019b, 2019c) and solar (Simonenko, 2012, 2014, 2015, 2016, 2019a, 2019b, 2019c, 2020) non-stationary cosmic energy gravitational influences owing to the gravitational interaction of the Sun with Jupiter, Saturn, Uranus and Neptune. We have analyzed the strongest earthquakes (presented in Table 1) of the Earth occurred near the dates \( t(\tau_{c,r},i) \) (corresponding to the years \( i = 1964 \) AD, 2011 AD,
Table 1. The analysis of the previous strongest earthquakes (according to the U.S. Geological Survey) of the Earth occurred on dates $t_i$ near the calculated dates $t'(\tau_{i,\tau})$ (corresponding to the years $i = 1964$ AD, 2011 AD, 2010 AD, 2012 AD, 1938 AD, 1922 AD and 2001 AD) of the local maximal values of the calculated combined planetary and solar integral energy gravitational influences (6) on the internal rigid core $\tau_{r,\tau}$ of the Earth.

| Year i | Date $t_i$ of strongest earthquake | Magnitude $M_{w,\text{loc. max.}}(i,\text{loc. max.})$ | Region of strongest earthquake | $\Delta(i) = |t_i - t'(\tau_{i,\tau})|$, in days |
|--------|-----------------------------------|---------------------------------|-------------------------------|-----------------------------------------------|
| 1964 AD | 1964-03-28                         | 9.2                             | Southern Alaska               | 15.48 days before the date $t'(\tau_{1964},1964) = 1964.2833333333 AD |
| 2011 AD | March 11, 2011                     | 9.0                             | near the east coast of Honshu, Japan | 27.39 days before the date $t'(\tau_{2011},2011) = 2011.2666666666 AD |
| 2010 AD | February 27, 2010                  | 8.8                             | offshore Bio-Bio, Chile       | 2.87 days before the date $t'(\tau_{2010},2010) = 2010.3666666666 AD |
| 2012 AD | April 11, 2012                     | 8.6                             | off the west coast of northern Sumatra | 31.92 days before the date $t'(\tau_{2012},2012) = 2012.3666666666 AD |
| 1938 AD | 1938-02-01                         | 8.5                             | Banda Sea                     | 16.69 days before the date $t'(\tau_{1938},1938) = 1938.1333333333 AD |
| 1922 AD | 1922-11-11                         | 8.5                             | Atacama, Chile                | 22.8 days after the date $t'(\tau_{1922},1922) = 1922.8 AD |
| 2001 AD | 2001-06-23                         | 8.4                             | near the coast of southern Peru | 15.72 days after the date $t'(\tau_{2001},2001) = 2001.4333333333 AD |

2010 AD, 2012 AD, 1938 AD, 1922 AD and 2001 AD) of the local maximal values of the calculated combined planetary and solar integral energy gravitational influences (6) on the internal rigid core $\tau_{r,\tau}$ of the Earth. These strongest earthquakes (presented in Table 1) occurred on the presented (in Table 1) dates $t_i$ (according to the U.S. Geological Survey) are characterized by the corresponding (presented in Table 1) magnitudes $M_{w,\text{loc. max.}}(i,\text{loc. max.})$ and the corresponding (presented in Table 1) regions of earthquakes. We see the unquestionable fact that the strongest earthquakes (characterized by the magnitudes $M_{w,\text{loc. max.}}(i,\text{loc. max.}) \geq 8.4$) of the Earth are characterized by the sufficiently small differences $\Delta(i)$ between the dates $t_i$ (of the strongest earthquakes occurred in years $i$) and the dates $t'(\tau_{i,\tau})$ (corresponding to the years $i$) of the local maximal values of the calculated combined planetary and solar integral energy gravitational influences (6) on the internal rigid core $\tau_{r,\tau}$ of the Earth. This unquestionable fact shows that we can use the global prediction thermohydrogravidynamic principle (6) for the reliable predictions of the strongest earthquakes (characterized by the large magnitudes $M_{w,\text{loc. max.}}(i,\text{loc. max.}) \geq 8.4$) of the Earth near the evaluated dates $t'(\tau_{i,\tau})$.

The strongest earthquakes (of the Earth occurred near the local maximal values of the calculated combined planetary and solar integral energy gravitational influences (6) on the internal rigid core $\tau_{r,\tau}$ of the Earth) occurred in the range from 1980 AD and before 1994 AD (of the weakened seismic activity of the Earth) are analyzed additionally.
The strongest earthquakes (occurred near the local maximal combined planetary and solar integral energy gravitational influences (6) on the internal rigid core \( \tau_{c,r} \) of the Earth) are considered and analyzed on the two-dimensional plane

\[
(M_{up}(i, \text{loc. max.}), \Delta_{g,S,P}(i) \sin \varphi(i)),
\]

where \( M_{up}(i, \text{loc. max.}) \) is the maximal (for the year \( i \)) magnitude of the strongest earthquake occurred on the date \( t_{e}(i) \) near the local maximal combined planetary and solar integral energy gravitational influence (6) (for the year \( i \)) on the internal rigid core \( \tau_{c,r} \) of the Earth,

\[
\Delta_{g,S,P}(i) = \frac{\Delta G(\tau_{c,r}, t'_{e}(\tau_{c,r}, i)) - \Delta G(\tau_{c,r}, t_{e}(\tau_{c,r}, i))}{\Delta E(\tau_{c,r}, \tau_{i})},
\]

is the normalized dimensionless numerical function (based on the global prediction thermohydrogravidynamic principles (6) and (7)) calculated (for the corresponding year \( i \) related with the date \( t_{e}(i) \) of the occurred strongest earthquake) based on the local maximal value

\[
\Delta G(\tau_{c,r}, t'_{e}(\tau_{c,r}, i)) = \int_{t_{e}(\tau_{c,r}, i)}^{t'_{e}(\tau_{c,r}, i)} dt' \int \int \int \frac{\partial \psi_{\text{comb}}}{\partial t'} \rho_{c,r} dV
\]

and based on the local minimal value

\[
\Delta G(\tau_{c,r}, t_{e}(\tau_{c,r}, i)) = \int_{t_{e}(\tau_{c,r}, i)}^{t_{e}(\tau_{c,r}, i)} dt' \int \int \int \frac{\partial \psi_{\text{comb}}}{\partial t'} \rho_{c,r} dV
\]

of the combined planetary and solar integral energy gravitational influences (for the year \( i \)) on the internal rigid core \( \tau_{c,r} \) of the Earth. The angles (characterizing the displacement of the internal rigid core \( \tau_{c,r} \) relative to the Earth’s axis \( \Omega \) of rotation) \( \varphi(i) \) (related with the strongest earthquake occurred on the date \( t_{e}(i) \)) are calculated (for application in (12)) based on the condition of the equal angle deviations of the Earth and Jupiter from the straight line Earth – Sun – Jupiter.

The expression \( \Delta_{g} E(\tau_{c,r}, \tau_{i}) \) of the maximal integral energy gravitational influence of the Mercury on the internal rigid core \( \tau_{c,r} \) of the Earth:

\[
\Delta_{g} E(\tau_{c,r}, \tau_{i}) = 2 \gamma M_{c,r} M_{1} \frac{R_{1}\gamma T_{3}}{(R_{1}^{2} - R_{01}^{2})(T_{3} - T_{i})}
\]

is used in relation (13) for \( \Delta_{g,S,P}(i) \) as a measuring unit for normalization of the combined planetary and solar integral energy gravitational influence (for the year \( i \)) on the internal rigid core \( \tau_{c,r} \) of the Earth. Here \( \gamma \) is the gravitational constant, \( M_{c,r} \) is the mass of the internal rigid core \( \tau_{c,r} \) of the Earth, \( M_{1} \) is the mass of Mercury, \( R_{01} \) is the average radius of the Earth’s orbit around the Sun, \( R_{1} \) is the average radius of the Mercury’s orbit around the Sun, \( T_{3} \) is the time period of circulation of the Earth around the Sun, \( T_{i} \) is the time period of circulation of Mercury around the Sun.

We have established that the dimensionless determinant range (defined by
includes only 3 (from the all analyzed strongest earthquakes) strongest earthquakes (occurred near the local maximal combined planetary and solar integral energy gravitational influences (6) on the internal rigid core \( \tau_c \) of the Earth) occurred on the following dates (characterized by the indicated maximal magnitudes and regions of the strongest earthquakes):

1) \( t_c (1994) = 1994-10-04 \) (\( M_{up} (1994, \text{loc. max.}) = 8.3 \), Kuril Islands), \( (18) \)

2) \( t_c (1984) = 1984-02-07 \) (\( M_{up} (1984, \text{loc. max.}) = 7.6 \), Solomon Islands), \( (19) \)

3) \( t_c (1992) = 1992-12-12 \)

\( (M_{up} (1992, \text{loc. max.}) = 7.8 \), Flores region, Indonesia). \( (20) \)

We take into account that the strongest earthquake (during the considered (Simonenko, 2019b, 2020) range (9)) occurred (according to the U.S. Geological Survey) on

\[ t_c (2020) = \text{January 28, 2020 AD}. \] \( (21) \)

This date \( (21) \) corresponds to the calculated determinant value

\[ \Delta_{g,S,P} (2020) \sin \phi (\text{January 28, 2020}) = 2220.3855, \] \( (22) \)

based on the corresponding calculated values

\[ \Delta_{g,S,P} (2020) = 5097.9445, \] \( (23) \)

\[ \sin \phi (\text{January 28, 2020}) = \sin 25.82' = 0.43554526. \] \( (24) \)

The calculated determinant value \( (22) \) belongs to the range of the determinant values \( (17) \), which contains only three corresponding calculated determinant values (corresponding to the considered above three strongest earthquakes):

\[ \Delta_{g,S,P} (1994) \sin \phi (1994-10-04) = 2506.1754 \quad \text{for} \quad t_c (1994), \] \( (25) \)

\[ \Delta_{g,S,P} (1984) \sin \phi (1984-02-07) = 2113.2566 \quad \text{for} \quad t_c (1984), \] \( (26) \)

\[ \Delta_{g,S,P} (1992) \sin \phi (1992-12-12) = 2474.3391 \quad \text{for} \quad t_c (1992). \] \( (27) \)

Based on the first combination of strongest (second and third) earthquakes and using the real maximal magnitudes of these strongest earthquakes:

\[ M_{up} (1984, \text{loc. max.}) = 7.6, M_{up} (1992, \text{loc. max.}) = 7.8, \] \( (28) \)

and the corresponding calculated (in the first approximation of the circular orbits of the planets) determinant values \( (26) \) and \( (27) \) based on the corresponding calculated values:

\[ \Delta_{g,S,P} (1984) = 5094.6407, \] \( (29) \)

\[ \sin \phi(1984-02-07) = \sin 24.51' = 0.41485199, \] \( (30) \)

\[ \Delta_{g,S,P} (1992) = 3296.0997, \] \( (31) \)

\[ \sin \phi(1992-12-12) = \sin 48.65' = 0.7506877, \] \( (32) \)
we have evaluated (based on the linear interpolation) the first maximal magnitude $M_{up}(2020,\text{loc. max.}, 1)$ corresponding to the calculated determinant value (22):

$$M_{up}(2020,\text{loc. max.}, 1) = M_{up}(1984,\text{loc. max.}) + \left(\frac{\Delta_{g,S,P}(1992,\text{loc. max.}) - \Delta_{g,S,P}(1984,\text{loc. max.})}{\left(\sin(1992-12-12) - \sin(1984-02-07)\right)\Delta_{g,S,P}(2020,\text{loc. max.}) - \Delta_{g,S,P}(1984,\text{loc. max.})}\right)$$

$$= 7.6 + \frac{(7.8 - 7.6)(2220.3855 - 2113.2566)}{2474.3391 - 2113.2566} = 7.6593$$

of the probable most strongest earthquake during the considered (Simonenko, 2019b, 2020) range (9).

Based on the second combination of strongest (second and first) earthquakes and using the real maximal magnitudes of these strongest earthquakes

$$M_{up}(1984,\text{loc. max.}) = 7.6, M_{up}(1994,\text{loc. max.}) = 8.3,$$  

(34)

the calculated determinant value (26) and the corresponding calculated (in the first approximation of the circular orbits of the planets) determinant value (25) based on the corresponding calculated values:

$$\Delta_{g,S,P}(1994) = 3882.7923,$$  

(35)

$$\sin(1994-10-04) = \sin 40.2' = 0.645457,$$  

(36)

we have evaluated (based on the linear interpolation) the second maximal magnitude $M_{up}(2020,\text{loc. max.}, 2)$ corresponding to the calculated determinant value (22):

$$M_{up}(2020,\text{loc. max.}, 2) = M_{up}(1984,\text{loc. max.}) + \left(\frac{\Delta_{g,S,P}(1994,\text{loc. max.}) - \Delta_{g,S,P}(1984,\text{loc. max.})}{\left(\sin(1994-10-04) - \sin(1984-02-07)\right)\Delta_{g,S,P}(2020,\text{loc. max.}) - \Delta_{g,S,P}(1984,\text{loc. max.})}\right)$$

$$= 7.6 + \frac{(8.3 - 7.6)(2220.3855 - 2113.2566)}{2506.1754 - 2113.2566} = 7.7908$$

of the probable most strongest earthquake of the Earth during the considered (Simonenko, 2019b, 2020) range (9).

The explained evaluated narrow range (11) of the maximal magnitudes of the probable most strongest earthquake during the considered (Simonenko, 2019b, 2020) range (9):

$$M_{up}(2020,\text{loc. max.}, 1) + M_{up}(2020,\text{loc. max.}, 2) = 7.6593 + 7.7908$$  

(38)

includes the maximal magnitude $M = 7.7$ (according to the U.S. Geological Survey) of the strongest earthquake of the Earth occurred on January 28, 2020 AD near the calculated (Simonenko, 2020) mean date (February 5, 2020 AD) of the probable most strongest earthquake occurred during the considered (Simonenko, 2019b, 2020) range (9). The mean maximal magnitude
M_{up}(2020,loc. max.) = 7.725 \text{ (of the obtained first and second maximal magnitudes 7.6593 and 7.7908)} \text{ is in good agreement with the maximal magnitude } M = 7.7 \text{ (according to the U.S. Geological Survey) of the strongest earthquake of the Earth occurred on January 28, 2020 AD near the calculated (Simonenko, 2020) mean date (February 5, 2020 AD) of the probable most strongest earthquake occurred during the considered (Simonenko, 2019b, 2020) range (9).}

It is evident that this good agreement between the real magnitude \(M = 7.7\) (of the strongest earthquake occurred on January 28, 2020 AD during the considered (Simonenko, 2019b, 2020) range (9)) and evaluated mean maximal magnitude (39) (of the probable most strongest earthquake during the considered (Simonenko, 2019b, 2020) range (9)) means that the applied thermohydrogravidynamic theory describes reasonably the global energetics the internal rigid core \(\tau_{c,r}\) of the Earth related with the established (Simonenko, 2012, 2014) flux \(J_g\) (determined by the relation (5)) of the combined (planetary and solar) radiated gravitational energy.

### 4. Conclusion

We concluded (on April 30, 2021) that this good agreement between the real magnitude \(M = 7.7\) (of the strongest earthquake occurred on January 28, 2020 AD during the considered (Simonenko, 2019b, 2020) range (9)) and evaluated mean maximal magnitude (39) (of the probable most strongest earthquake during the considered (Simonenko, 2019b, 2020) range (9)) means that the magnitudes of the strongest earthquake of the Earth (occurred near the calculated maximal combined planetary and solar integral energy gravitational influences (6) on the internal rigid core \(\tau_{c,r}\) of the Earth) are theoretically explainable and consequently are predictable (in advance) based on the presented thermohydrogravidynamic technology.

Based on the presented theoretical thermohydrogravidynamic theory, it is possible to expand the developed thermohydrogravidynamic technology (of evaluation of the maximal magnitudes of the strongest earthquakes occurred near the maximal combined planetary and solar integral energy gravitational influences (6) on the internal rigid core \(\tau_{c,r}\) of the Earth) for evaluation of the maximal magnitude of the strongest earthquake of the Earth occurred near the calculated (Simonenko, 2019a) forthcoming date \(t_c(\tau_{c,r}, 2021) = 2021.65\) AD (corresponding to July 26, 2021 AD, which belongs to the forthcoming range from July 23, 2021 AD to August 8, 2021 AD of the forthcoming Olympic games in Japan) of the minimal combined planetary and solar integral energy gravitational influence (7) on the internal rigid core \(\tau_{c,r}\) of the Earth.

The developed thermohydrogravidynamic technology can be used for evaluation of the maximal magnitude of the strongest earthquake of the Earth near the calculated (on April 30, 2021) forthcoming date \(t'(\tau_{c,r}, 2022) = 2022.18333333\) AD (given in the author’s presentation on the 11th International Conference on Geology and Geophysics) related with the maximal combined planetary and solar integral energy gravitational influence (6) on the internal rigid core \(\tau_{c,r}\) of the...
Earth.

The developed thermohydrogravidynamic technology can be used (by the participants of the 11th International Conference on Geology and Geophysics) for evaluation of the maximal magnitudes of the strongest earthquakes near the calculated (on April 30, 2021) forthcoming date \( t'(\tau_{c}, 2022) = 2022.18333333 \) AD for Japan, Italy, Greece, China, Chile and USA (especially, for California (Simonenko, 2019c)), for which we have established previously (Simonenko, 2018, 2019c) the confirmed cosmic energy gravitational genesis of the strongest earthquakes.

Based on the analysis (presented in Table 1) of the previous strongest earthquakes (according to the U.S. Geological Survey), we conclude that if the magnitude \( M_{up}(2022, \text{loc. max.}) \) of the strongest earthquake of the Earth (which will occur on date \( t_c(2022) \) near the calculated forthcoming date \( t'(\tau_{c}, 2022) = 2022.18333333 \) AD) will be larger than 8.4, then this strongest earthquake of the Earth will occur (according to Table 1) during the sufficiently small range \( |t_c(2022) - t'(\tau_{c}, 2022)| \leq 31.92 \) days.

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Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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