# Long-term forecasting of climate change and natural disasters on the Earth

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***Suggested herein with is a new model of terrestrial heat sources based on thorough analysis of universally recognized experimental data on the physics of the Earth and its heat balance. In this model the heat generation still is going on in hydrogen Earth's core (superdense hydrogen radicals). This hypothesis considers the wave processes in the Earth's core which, due to induction, generated by dynamic gravitational fields, markedly affect the heating of the upper layers of the Earth and, consequently, the climate and local environmental processes. Basing on these new energy sources, the Earth's heat balance models must be revised, it would allow long-term forecasting of climatic shifts and local environmental disasters.***

***Moreover, our model shows that small hydrogen diffusion from the Earth's outer core through the mantle provides an answer as to how the water on our planet was originated. This was confirmed by the recent sensational discovery of a group of American scientists led by Steven D. Jacobsen in their work "Dehydration melting at the top of the lower mantle"***

***The Earth's climate is determined, along with the solar light energy, by the wave movement in the Earth's outer core. Through induction-gravitational interaction, these waves transfer the energy to the mantle, the core, the oceans, and the atmosphere.***

## Introduction

The Earth as a planet is approximately 4.5 billion years old. How life came about and how it originally developed is anybody's guess. What is certain is that the oldest traces of it were discovered in archeus rocks aged between 2.6 to 3.5 billion years, in the way of bacteria fragments and blue and green algae. Also known for sure is that life on the Earth has been a continuous process for 3.5 billion years. It follows that the solar light intensity has undergone no significant change during this period [1].

It has been recently discovered that 800 million years ago the temperature on the Earth's poles was higher than that at the equator, and Antarctic could boast vast tropical forests. It has been further established that Antarctic could not have drifted from the equator to the South Pole within so short a time [2]. In addition, as seen from the glacier period cycles and the texture of the permafrost in the northern and southern hemispheres, the Sun's activity has nothing to do with these dramatic processes. A legitimate question arises therefore: why has the climate been changing so drastically given the unchanged solar behavior and the position of the Earth's axis against the surface of the ecliptics? Great strides have certainly been taken in recent years to develop the numerical climatic models with due consideration of all the components of the "atmosphere-hydrosphere-kryosphere-biosphere" climatic system. Yet the brain-racking complexity of these models and a great variety of the schemes that they use featuring the empirical parametrization of different processes makes it extremely hard to meaningfully evaluate their adequacy from the point of view of climatic forecasting. What's been achieved so far is a fairly schematic and treacherous compatibility of the numerical modeling effort with actual climatic manifestations [3]. Add to that the virtual inability of numerous supercomputer gurus to calculate long-term weather fluctuations, to say nothing of such big things as

glacier periods or global warmings. One conclusion is obvious therefore: it is not the powerful computers but the wrong modeling presumptions that are to blame. It takes a dramatically different look on how the Earth is structured to adequately address the looming challenges.

## The Earth's Macroquantum Laws

The Earth is known to be made up of an inner core; an outer core; a mantle; and a solid core, or crust. The inner core has a radius ($R_{\oplus\ 1}$) of 1217.1km. It probably consists of a gaseous substance resistant to cross-cut seismic (acoustic) waves. Its gas pressure is $3.6324 \cdot 10^2$ GPa. The outer core has a radius $R_{\oplus\ 2}$ of 3485.7km. It is made up of a liquid substance with a temperature evaluated at 6200K and a density level of 13.012 g/cm$^3$ [4]. Located farther on is a liquefied mantle with a radius $R_{\oplus\ 3}$ of 6031km covered with a thin solid crust with a $\Delta R_{\oplus\ 4}$ of 340km.

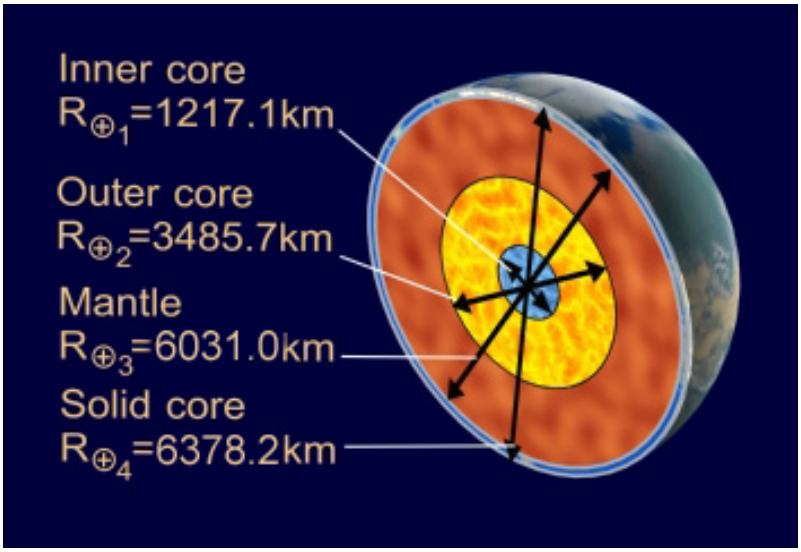


**Fig.1 The Earth's inner structure**

As shown by W. Kuhn and A. Rittmann (1941) [5], the bulk of the solar system is composed of hydrogen. Therefore, hydrogen must be a significant part not only of the outer planets of the solar system - the gas giants, but also the inner planets. They believed that the Earth's core consists of hydrogen in a superdense state. The diffusion of hydrogen from the nucleus followed by its oxidation and formed a water shell of the Earth. Let us develop their idea.

Let's suppose that the Earth's outer core, just like the Sun's [6], is nothing but quasiplasma governed by the macroquantum electromagnetic laws. Then there may be waves along its surface moving at a speed of:

$$v_{\oplus 1} = \frac{\alpha c}{\sqrt{8\pi}}. \qquad (1)$$

Where $\boldsymbol{\alpha}$ is a thin structure constant and $\boldsymbol{c}$ is the speed of light. This wave's kinetic energy will correspond to a temperature of

$$T_{\oplus} = \frac{m_e v_{\oplus I}^2}{2k} = 6282.10K, \qquad (2)$$

where $\boldsymbol{k}$ is the Bolzman constant, and $\boldsymbol{m_e}$ is the electron mass. This temperature (2) corresponds to the one in the Earth's center [1] and matches the coloring temperature in the middle of the Sun's disk [4].

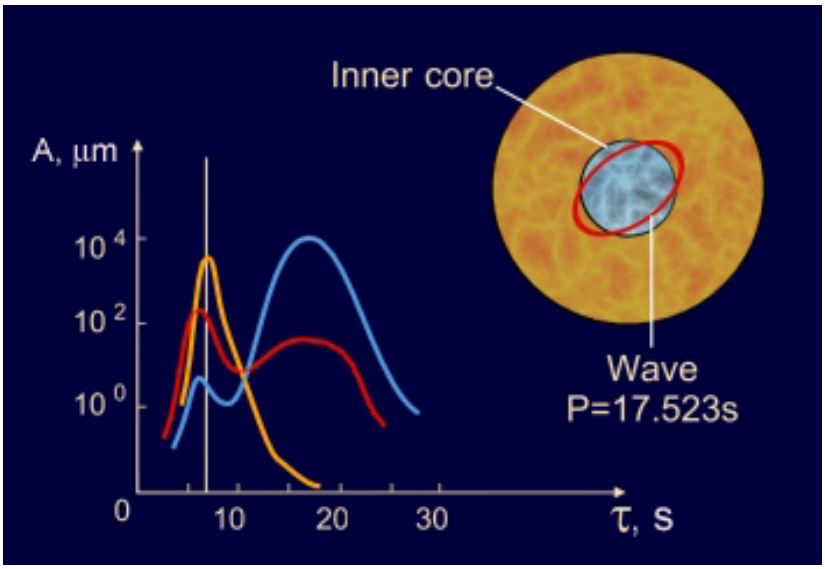


**Fig.2 The Earth's Acoustic Noise**

The wave (1) has a round-the-core rotation period of

$$P_{\oplus 1} = \frac{2\pi R_{\oplus 1}}{v_{\oplus 1}} = 17.523 \text{ sec.} \qquad (3)$$

The wave (1) shaped as a spectral peak is easily registered by all ocean seismic stations in the Pc3 (10-45sec.) range. Land-based stations, in addition, can detect a second peak with a period of 8.7sec. in the Pc2 (2-10sec.) range [7]. These peaks previously defied any theoretical reasoning, although the aggregate wave power within these ranges is dozens of times as great as that of all the Earth's seismic waves.

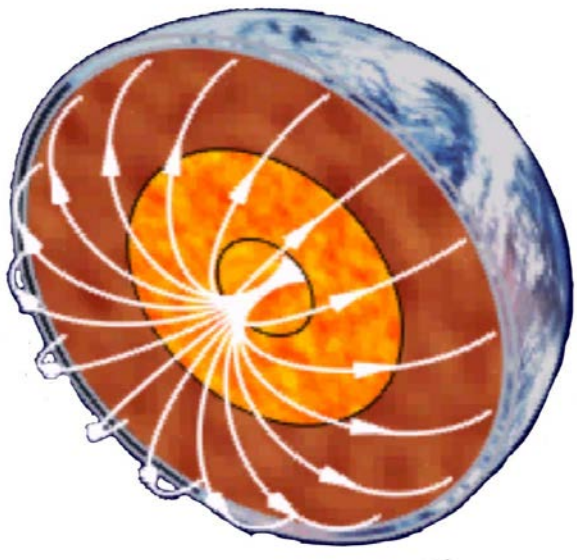

**Fig. 3. Induction-gravitational fields of the Earth.**

One should keep in mind that the Earth's electromagnetic field [8] oscillates in the immediate Pc3 frequency range. In other words, the energy of a wave moving in the Earth's

outer core should have an impact on both the crust and the ionosphere and affect the Earth's climate dramatically. This influence can be traced to the ocean behavior.

It is generally known [9] that particles in the water, kept out of balance, will perform small oscillations next to the balance position on the Viaisial frequency $f_v$ , the oscillation frequency being determined by both water depth and salinity. Specifically, the $f_v$. maximum in the North Pacific is located at a level of 100 to 200 meters and equals to 0.02Hz, while the one on the equator, 100-200 meters deep, is equal to 0.06Hz, already coinciding with the Pc3 seismic wave frequency of 0.057Hz and the geomagnetic pulsing frequency. That proves, therefore, that the wave energy of the Earth's core can, by way of resonance, directly affect the ocean's upper layers, mostly in the area of the equator, forming sort of a thermal protective shield 100 to 200 meters deep that keeps out cold deep ocean waters with a temperature averaging 3.8°C. The thermal impact of the sun rays is minuscule: the water gets warm within just a few dozen meters and never at a level of 100 to 200 meters where the ocean's main thermal sources are located.

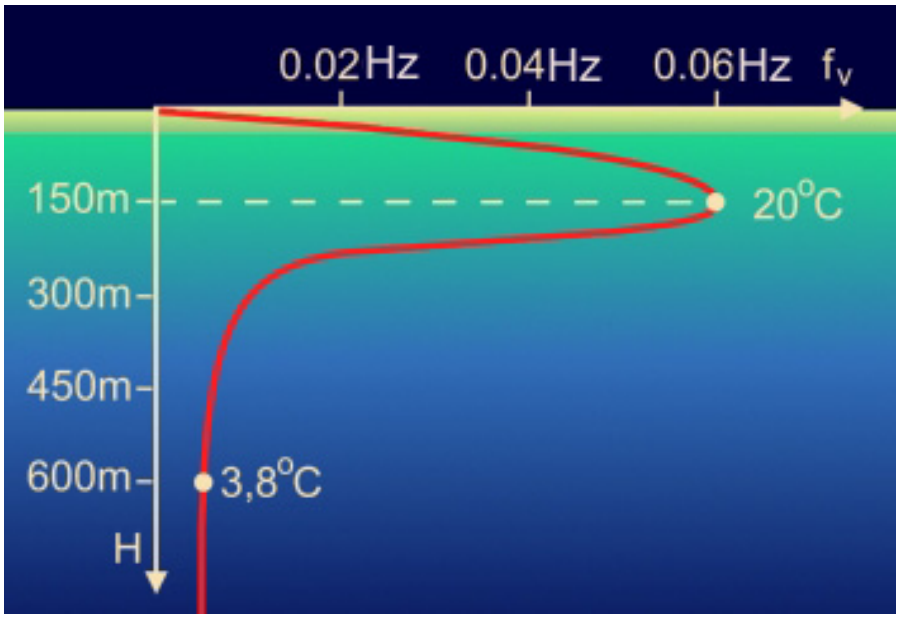


**Fig.4 Ocean Deep-Water Temperature Distribution**

Some waves in the Earth's outer core seem to be moving in different directions. This may trigger the induction flow of the ocean waters, the Gulf Stream being a good case in point.

One can find, getting back to the Earth's distant past, that the average ocean temperature was 23°C and the water level was 500m higher than the prevailing one some 110 million years ago [10]. This couldn't have been accounted for by the fall of huge space objects as blast-motivated dust clouds dissipate within a few years. Nor could it have been the reason for the dinosaur extinction that were dying out in the course of millions of years. It is apparent, therefore, that the probable source of the Earth's climatic changes could be either the long-term processes within the terrestrial core or the cosmic origin of the changes themselves. One knows for a fact, however, that the Sun's light intensity has been unchanged within the last 3 billion years and couldn't possibly affect the Earth's climate [10].

Let us get back to our model. Suppose that the movement of quasiplasma along the Earth's outer core's inner surface also triggers the movement of its electrostatic field [6]. In this case, the tips of the vectors of this field cannot move in the condensed environment (the mantle) faster than $\alpha c$. If so, then the tip of the radius-vector of such a field will be located at a distance of

$$R_{\oplus}^{'} = \sqrt{8\pi} R_{\oplus 1} = 6101.64\text{km}. \qquad (4)$$

In other words, the radius-vector ends within 270km from the Earth's surface.

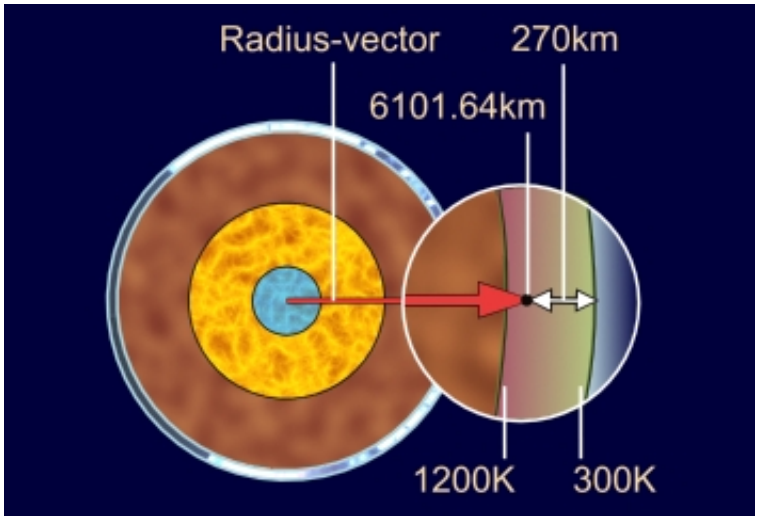


**Fig.5 The Earth's Induction Radius-Vector**

This particular model of the Earth's internal structure solves the paradox related to the heating pattern of the Earth's mantle. It was originally thought that the heating occurred through mere diffusion of the heat coming from the terrestrial core which had remained there since the Earth's formation. That idea had to be abandoned, however, because of the small mantle heat diffusion ratio. A new, convective, model presumed the heating of the mantle by way of heat local mixing. If true, those convective heat streams would have provoked continual major earthquakes which was not the case. Then followed a model of the mantle heated through radioactive decay of long-living $U^{238}$, $U^{235}$, $Th^{232}$, $K^{40}$ isotopes. That approach would have yeilded a mantle and core heating temperature three times as little as the prevailing one. In addition, that kind of heating would have triggered the Earth's radioactive contamination through volcanic activity, which isn't the case either [11].

The model being suggested is focused on the heating through electromagnetic induction triggering the mantle's thermal heating all across the board. This rules out diffusion, convection and surface radioactive contamination.

Moreover, small hydrogen diffusion from the Earth's outer core through the mantle provides an answer as to how the water on our planet was originated. The Earth's hydrogen core model has been used before to account for water origins on the Earth. It didn't, however, consider the hydrogen core as a power source [12, p.90; 13].

Considering the model suggested above, we might look into how the Earth's bipole magnetic field is formed. Let us assume that an electron ring wave is moving along the outer core's inner surface in a specific direction at a speed of $v_{\oplus 1}$ (1). A similar wave, different in power from the former one, is heading in the opposite direction. The axes of these two ring currents are not parallel. In this case, the aggregate magnetic field of these currents might be shifted against the Earth's center. This shift, as current experiments testify, is 462km. The bipole axis' north pole and the south pole would also be shifted against the Earth's axis. The Earth's magnetic fields are known to be slowly drifting as far as to change their polarity. This may be accounted for by the movement of the ring currents along the outer core's inner surface.

The above approach provides general answers to the paradoxes related to the Earth's magnetic field and identifies the true power source that creates it.

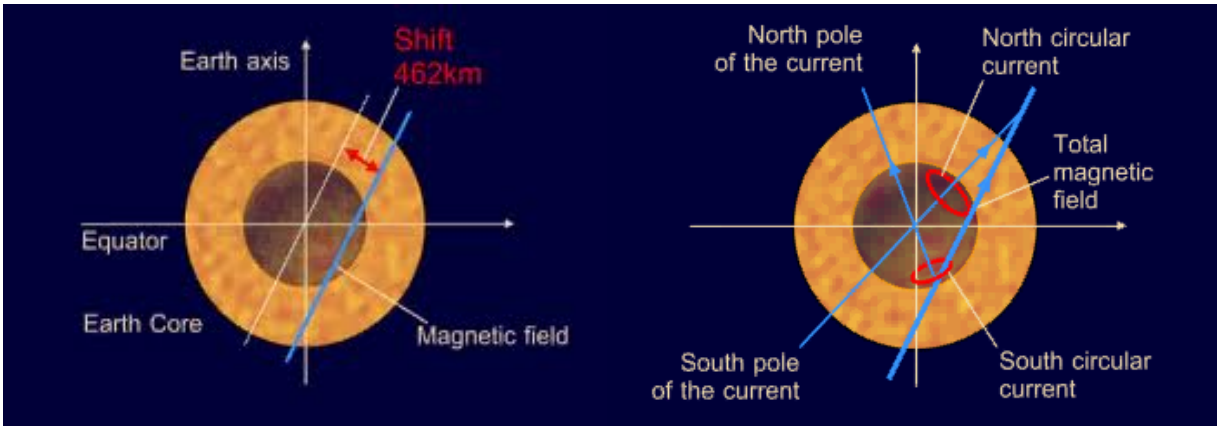


**Fig.6. The shift of the magnetic field of the Earth**

A paper [6] says that the kinetic anisotropic energy of the terrestrial outer core's gravitational compression is transformed into the energy of the electric currents movement in quasiplasma, into the Earth's temperature, into the kinetic energy of the Earth's rotation, etc. The anisotropic component of the gravitational compression in the outer core's shell is about 500 times as powerful as the regular gravitational compression. It is this anisotropy of the gravitational compression that is the main energy source in the Earth's core. That amount of energy should be quite sufficient for hydrogen transmutation into heavier elements that form the mantle.

Let us prove now that the quasiplasma waves inside the Earth provide energy to the oceans in the way of tides and ebbs.

It has been considered, since Newton's times, that tides and ebbs on the Earth are triggered by the Moon: the kinetic energy of the Moon's rotation turns into the kinetic energy of the water movement on the Earth. If the above is true, then the Moon should be nearing the Earth [14]. Besides, according to Laplace, the Earth should have two wave water humps. It was found, however, that the humps were shifted $2.16^{o}$ ahead against the Earth-Moon axis.

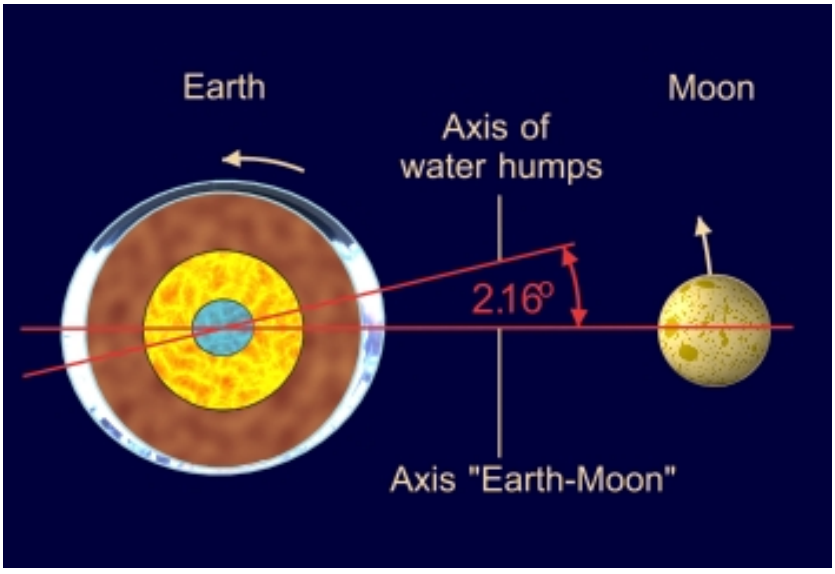


**Fig.7. The Moon's Lagging Movement**

It follows from the above that it is not the Moon's kinetic energy but the kinetic energy of the Earth that impacts the Moon, so the Moon should become increasingly distant. Numerous meticulously accurate measuring experiments have shown, however, that the Moon is neither becoming closer nor drifting away from the Earth. Moreover, upon closer consideration, the

phase patterns of the ocean tides behave very much like resonator waves discarding the Laplace tide theory as even the first approximation to describe the tide and ebb phenomenon [14].

This paradox can be happily resolved by assuming that the Moon is positioned against the Earth at a strictly determined macroquantum distance [6].

Let us suppose that along the outer core's inner surface, besides the fast wave mode (1), there is a slow wave mode moving at a rate of

$$v_{\oplus 3} = 4\alpha^4 c. \quad (5)$$

This wave's spreading period will be as follows:

$$P_{\oplus 3} = \frac{2\pi R_{\oplus 1}}{v_{\oplus 3}} = 26.103 \text{ days} \quad (6)$$

This period is 4.67 percent shorter than the actual sideric period (27.32166 days) of the Moon's rotation round the Earth. The period matching can be achieved by assuming that the wave itself should spread a bit deeper than the Earth's outer core surface. This wave should be bent toward the Earth's equator surface in accordance with the Moon's orbit.

A conclusion is evident, therefore, that the quasiplasma wave (5) induces, on the Earth surface, the movement of the ocean waves in the way of two humps (tides and ebbs) that move at a bit faster rate than the Moon itself.

One can assert, therefore, that the anisotropic compression gravitational energy of the Earth's outer core also impacts our satellite, the Moon. It is destined to be our fellow-traveller until the Earth has cooled down. Only then will they become one.

**Conclusions**

The Earth's new physical model provides enough room for the following:

1. It has been revealed that the Earth's acoustic noise is originated by the movement of the quasiplasma waves in the Earth's outer core.
2. It has been revealed that the Earth's mantle heating is triggered by the induction heating caused by the movement of the quasiplasma waves in the Earth's outer core. The radius-vector of the plasma waves ends 270km deep into the Earth which prevents the Earth's crust surface from excessive overheating. This may have been the factor that was responsible for the inception and development of life on the Earth.
3. It has been revealed that the two ring quasiplasma waves in the outer core may be the source of the Earth's magnetic field. The movement of these electric currents along the outer core's inner shell gives rise to continual drifting of the magnetic field's axis as far as the total change of its North and South poles.
4. It has been revealed that the long-term modes of the quasiplasma waves in the Earth's outer core induce the movement of tides and ebbs in the ocean. They are also gravitationally connected with the Moon and its rotation round the Earth. This phenomenon provides the clue to the Moon's lagging movement against the tidal waves. It is also highly possible that some quasiplasma currents in the core induce currents in the ocean.
5. It has been revealed that the upper ocean water layers (100-200m deep) are heated with the energy of the quasiplasma waves in the Earth's inner core. This water layer provides thermal protection from the ocean's deep waters and actually determines the Earth's climate.

**Final Statements**

So, macroquantum laws for the Earth have been found. It has been revealed that its outer core is made up of quasiplasma, a solar substance the compression potential energy of which turns into the kinetic energy of the Earth's rotation, the kinetic energy of the Moon's rotation

round the Earth, the kinetic energy of the ocean water movement, and the thermal energy of the mantle's heating.

The Earth's climate is determined, along with the solar light energy, by the movement of the waves in the Earth's outer core. These waves, by way of induction interaction, provide the energy to the mantle, the crust, the oceans, the atmosphere, and the ionosphere.

In other words, weather forecasting is possible only through mastering the techniques of measuring the Earth core's induction fields.

The swift, spasmodic movements of the waves inside the Earth may also trigger seismic changes in the way of deep-lying earthquakes that may cause the movement of the crust and destructive earthquakes on the Earth's surface. It is, therefore, extremely vital to establish a new approach to earthquake forecasting based on the Earth's macroquantum laws.

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