Electric Earthquakes? The case of Hyogo Ken Nambu (Japan)

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ABSTRACT

Understanding the complex mechanism of *Earthquake* phenomenon, as in all the natural systems on the Earth, does not necessarily depend on a single cause, but on a set of factors. This study is aimed at investigating the electrical phenomena that could trigger, accompany and follow an actual seismic event, with the focus of research on strong *Earthquakes* on a global scale of magnitude equal to or greater than 7. The variables analyzed in this study are different but the focus of the research has focused on three aspects. The first concerns the state of transition of the *Olivine* to about 10 km of depth and the release of electric charges and heat; the second analyzes the influence of the variation of the duration of the day; and a third analysis concerns the implication of electrical phenomena that may be at the basis of *Earthquake* triggering, in particular, the earthquakes of magnitude equal to or greater than 7. Another analysis of the strong earthquakes that occurred in 2018 concerned the Earth's Aphelion and Perihelion, linked to the Length of Day (LOD). The results showed that electrical phenomena play an important role in triggering *Earthquakes*.

Keywords*: Earthquakes, Olivine, Length of Day (LOD), Tidal Interaction, Electric Earth, Schumann Resonance*

1. INTRODUCTION

Electrical and magnetic phenomena associated with natural events such as earthquakes, volcanic eruptions, weather and solar wind have been known for years. However, the role of temperature and the implication of electro-magnetic phenomena in seismic triggering are relatively recent concepts. It is known that between the earth's surface and the upper atmosphere there is a voltage difference of 1/2 million volts and that there is a potential difference of 300,000 volts between the surface and the ionosphere. These values of electrical voltage, even if not directly perceived by man, play an important role in natural phenomena. Each component of the mosaic of this problem plays an important role as, for example, the electrons that exist in large quantities in the crust each have a different potential, while the atmosphere behaves like an ionized dielectric. In other words, the surface of the earth and the ionosphere surround the atmosphere and discharge on the dielectric barrier. The ionosphere is in fact composed of protons and electrons from the solar wind. Within the earth an important role for the production of electric charges is practiced by olivine. Both the ionosphere and the crust behave like an alternating current because the voltages possessed by the protons and electrons are disjoint. Protons move to the surface as an atmospheric current from the ionosphere. Instead, electrons also move towards the ionosphere from inside the crust. Inside the crust, a large amount of accumulated electrons is rotated to obtain an angular acceleration that creates a magnetic field and Schumann resonance. A part of the electrons becomes an electric current that flows towards the magma and becomes a source of energy. The electrons are emitted on the surface in the form of a dielectric barrier discharge. These mechanisms are assumed to be the basis of meteorological phenomena such as rain, typhoons and vortices. Most of the phenomena that occur in the crust and in the atmosphere can therefore be explained both as phenomena of electron transport and dielectric barrier discharge (Fig. 1). In this context, tornadoes and hurricanes behave like large electric motors powered by electricity coming from the sun, while high and low pressure areas are large areas with a positive or negative charge [1] [2] [3] [4] [5] [6].

2. ELECTRIC UNIVERSE?

The theory of the Electric Universe is based on the premise that space is composed of 99% of plasma, and plasma can exist in different states [7]. However, if energy levels are low, the plasma remains in invisible form. The plasma, as is known, is a conductor and is therefore crossed by electric currents, which however, become evident only if there is material in the space, such as dust or gas. The main characteristic of the Electric Universe theory is its relative simplicity and the ability to explain cosmic phenomena clearly without having to resort to new physics or the search for new subatomic particles [8]. The cosmic evidences, in a concept of the Electric Universe, could therefore be reproduced in the laboratory according to the "scientific method" proposed by Galileo.
The theory of the Electric Universe tries to explain what are the biggest and most controversial mysteries of the cosmos such as: matter and dark energy, the temperature of the solar corona, the electric discharges that are observed on the satellites of Saturn and Jupiter (or on comets), the existence of the graviton, the inconsistency of gravitational waves or the gravitational lens effect. The beauty of the Electric Universe theory, unlike the predominant gravitational theory is that it maintains a connection with the reality of the physical processes observed [9]. The verification of the theory should then take place in a process of experimentation, but since it is impossible to reproduce in the laboratory something that does not exist (such as dark matter), computer models are created that confirm its existence. In essence, the Galilean method in this process seems to have been progressively forgotten in order to leave room for an "Indirect Paradigm", based on the evidence of phenomena that cannot be directly tested. The nature of the Electric Universe not only involves Cosmology, but also Geology, Geophysics, Paleontology and even Archeology.

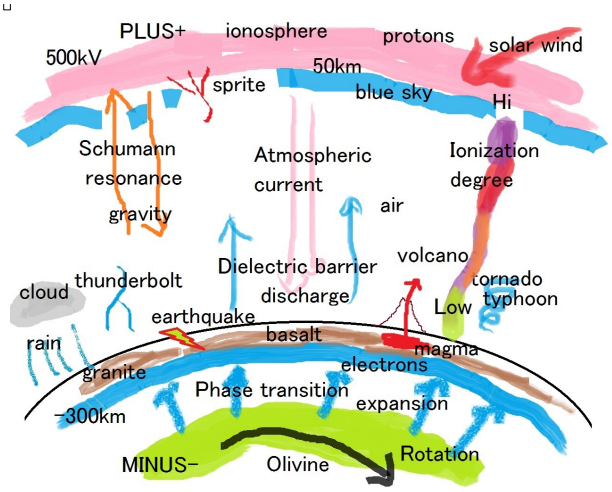

Fig. 1. Earth Dielectric Barrier Discharge Model. Explains earthquakes, typhoons, rain, lightning, etc., with discharge phenomena using the upper mantle and ionosphere as electrodes.

3. THE CASE OF HYOGO KEN NAMBU (JAPAN)

The example chosen is that of the earthquake of Hyogo Ken Nambu, of magnitude 7.3, which took place On January 17, 1995 in Kobe City. During the strong seismic shock, corresponding and particularly intense lighting effects were produced. The epicenter was 16 km deep under northern Awaji Island. At this time, the luminescence phenomenon was observed in the opposite direction to the epicenter, around Ikoma Mountain in Osaka. It is thought that the basement from Osaka to Kobe is granite, and granite is a dielectric that accumulates electrons and it is also a piezoelectric rock. The earthquake appears to be caused by a discharge that occurred in the vicinity of Akashi Strait, which exerted a piezoelectric effect near the hypocenter. The luminescence phenomenon occurring in Ikoma Mountain about 100 km from the epicenter is a boosting phenomenon due to the piezoelectric effect. Voltage of several million volts released in the epicenter increased to several hundreds of billions of volts due to longitudinal effect, that consist in a change of the voltage transmitted rather than vibration. It was seen as a light emission phenomenon. When the voltage is applied to one side of the piezoelectric body, it deforms. When the vibration, due to deformation, is transmitted to the opposite side, the voltage is generated by the piezoelectric effect. Hence, at this time, the place where the vibration occurs becomes a vibration node, so the place where it hits the edge becomes the vibration surfaces. Therefore, the voltage higher than the input is generated at the end of the piezoelectric body. In the Hyogo Ken Nambu earthquake, the Nojima fault moved up to 2 m. If the deformation rate of the piezoelectric body is set to 0.01% when it is 10000 V / m, in order to deform 2 m, it will suffice to apply a voltage of 2 million V to a rock with a thickness of 2 km. It is a phenomenon that the 2 million V which caused the earthquake was boosted, it reached several hundred million, billions of volts at the edge of the granite rock, causing a huge electric discharge in the air. When a large earthquake occurs, the rocks around the epicenter are polarized [10] [11] [12] [13] [14]. The direction of the piezoelectric body which the crystals inside the rock has by the voltage of the discharge is aligned. Polarized piezoelectric bodies are highly sensitive to voltage, so they will deform greatly even with a small voltage [15] [16]. Probably, in this hypothesis, it is because of this mechanism that the aftershock shocks are produced.

4. SCHUMANN RESONANCES

The Schumann resonances (SR) are a set of spectrum peaks in the extremely low frequency (ELF) portion of the Earth's electromagnetic field spectrum. Schumann resonances are global electromagnetic resonances, generated and excited by lightning discharges in the cavity formed by the Earth's surface and the ionosphere. Schumann resonance has multiple spectra, but the lowest frequency is 7.83 Hz. The relationship between the frequency and the wavelength of the electromagnetic wave is obtained by the following equation (1).

$$f = c / \lambda \quad \textbf{c} \text{ is the speed of light, } \boldsymbol{\lambda} \text{ is the wavelength} \quad (1)$$

The radius of the earth is 6371 km, the light speed of c is 299792458 m / s, and the circumference ratio is 3.141592.
Then, when the length of the ground surface is one wavelength, the frequency becomes 7.49 Hz. In the description of Wikipedia, since it resonates between the ionosphere and the ground surface, it should be lower frequency. Therefore, when calculating the radius at 7.83 Hz, it becomes 6096 km. This is the part of the acantosphere above the mantle under 275 km from surface. It is liquid at the part where the olivine changes phase transition to basalt, granite, and gabbro. Olivine inside Earth released a large amount of electrons, and there are a lot of electrons in their zone. It is thought that the electromagnetic waves are generated by the rotation of the electrons due to the rotation of Earth. This is the identity of Schumann resonance. Schumann resonance seems to be closely related to the occurrence of gravity on Earth surface. Also, a large amount of electrons generate a magnetic field.

5. OLIVINE

The mantle occupies most of the volume of Earth; its main constituent is olivine (Fig. 2). On the ground surface, you can find the olivine and peridotite that came out as the magma rises. The chemical composition of olivine is written as Mg_2SiO_4, but it reacts with methane CH_4 inside the mantle to generate water and carbon dioxide (Mg may changed to Fe).

$$2Mg_2SiO_4 + CH_4 \text{ - > } 2Mg_2SiO_2 + 2H_2O + CO_2 + 4e\text{-}$$

O_2 is separated from SiO_4 by phase transition. The volume will expand. At this time, two electrons used for bonding are released. The emitted electrons become ions or are taken into the interstices of rocks. Rocks are dielectrics and have the characteristic of capturing electrons within the crystal structure. Actually, since gravity is not working inside Earth, SiO_2 and water, carbon dioxide, and electrons, which have undergone phase transition, moves toward the surface by centrifugal force. Movement of the substance while increasing the volume results in enlarging Earth's surface. The most accumulated electrons are around 275 km underground. When this electron rotates on its own axis, ELF of Schumann resonance is generated. Also, the rotation due to the rotation of electrons also creates Earth's magnetic field. The electrons captured inside the dielectric gradually move toward the surface of Earth, but the speed of movement decreases with the occurrence of gravity. It can be

inferred that the depth at which electron transfer decreases is around 10 km underground. Earthquake hypocenter is concentrated in the vicinity of 10 km underground. The generation of a large amount of electrons from the interior of Earth means that Earth is a huge battery. The negative charges from Earth's interior and the solar-like positive charges face each other with the atmosphere. Our environment is in the potential difference of 300,000 volts of Earth's surface and the ionosphere.

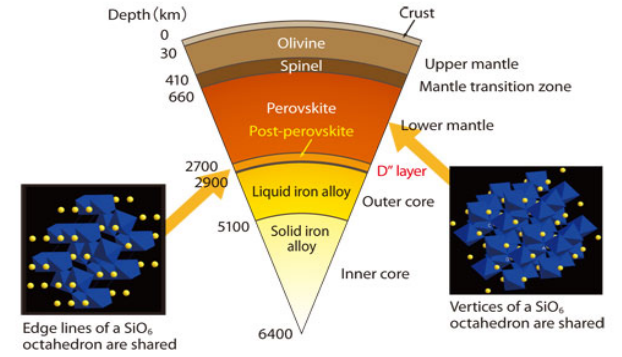

Fig. 2. Reproducing Earth's Deep Interior Conditions to Unravel its Structure
http://www.spring8.or.jp/en/news_publications/publications/scientific_results/earth_science/topic21

6. LENGHT OF DAY AND EARTHQUAKES

The mantle olivine, due to the state of transition and transformation into other magmatic rocks, emits a large quantity of electrons. The excess the current around the magma causes electric shocks. It is an earthquake. The rocks, in this hypothetical scenario, store electrons in dielectrics. When the electrons inside the rock increase, the discharge occurs (Fig. 3).

Throughout the year, the rotation speed of the Earth increases from the perihelion to the perihelion, and the rotation speed tends to decrease from the perihelion to the perihelion. This change in rotation speed is expected to change the olivine phase transition as the density of neutrinos changes. Solar neutrinos have little difference since the perihelion and perihelion are only 5 million kilometers away. However, since the influence of the solar magnetic field decreases at the far-day point, the number of galactic cosmic rays increases and the amount of atmospheric neutrinos increases. Seasonal changes in atmospheric neutrinos can be inferred from changes in muons. This is because muon generation and atmospheric neutrinos have the same cause. The change in neutrino flux is evident from the following in Figs. 4 & 5.

The graph of Fig. 6, (Lower side of the graph), compares earthquakes of magnitude 7 or more (Tab. 1) that occurred in 2018 with LOD (Length of Day) and positions of Perihelion and Aphelion of the Earth. As the curve descends into the graph, the length of the day becomes shorter. So the rotation speed of the Earth increases. As can be seen in the Fig. 6, (Lower side of the graph), most earthquakes of magnitude M7 occur when the speed of rotation is high. If the rotation speed increases, i.e. when the current flowing through the core of the "Faraday motor" increases, then it is conceivable that a strong earthquake will occur.

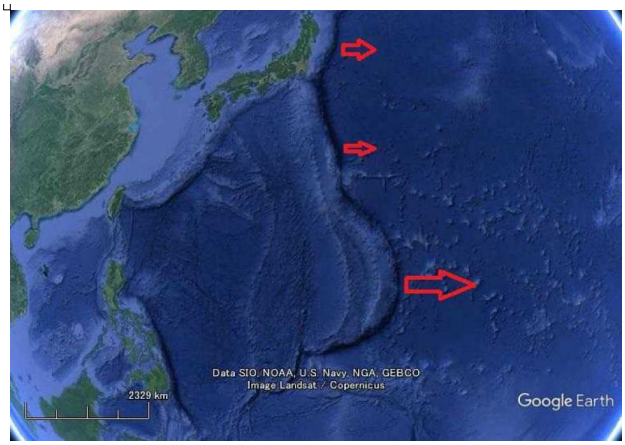

Fig. 3. Pacific Volcanic Belt is a magma belt that goes around the earth. A current flows through the magma and acts as a Faraday motor by interacting with the geomagnetic field.

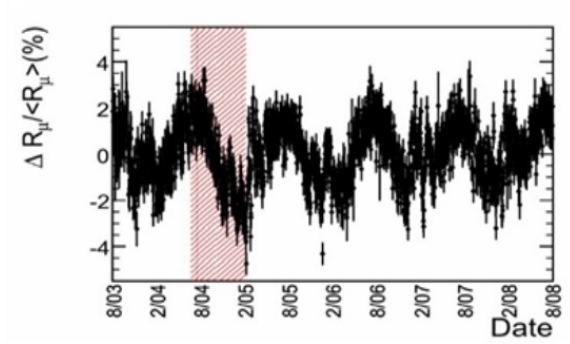

Fig. 4. Daily Deviation Mean Rate of Cosmic Ray Muon Arrivals. From 08/03-08/08, shown here with statistical error bars. The periodic fluctuations have expected maxima in August, minima in February. The hatched region indicates the period of time when the detector ran with the magnetic field reversed from the normal configuration.

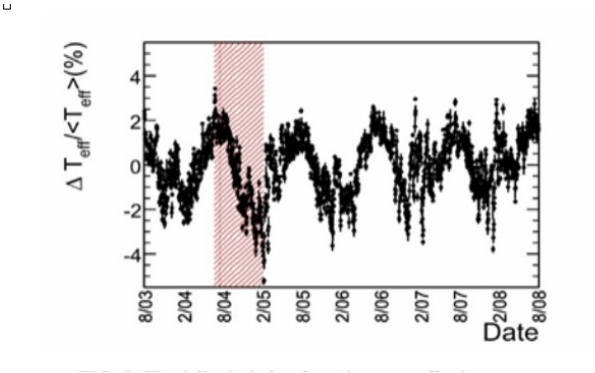

Fig. 5. Daily Deviation Mean Effective Temperature over a period of five years, beginning when the far detector was complete, 08-03-08/08. The hatched region indicates the period of time when the detector ran with the magnetic field reversed from the normal configuration (MINOS Collaboration Observation of muon intensity variations by season with the MINOS far detector). https://arxiv.org/abs/0909.4012

It can be seen that LOD is also affected by the position of the Moon (Fig. 6). Because the moon has a negative charge, it has a great influence on the behavior of electrons inside the earth.

The influence of the moon is great for the LOD to change in a cycle of about 28 days. The reason why the rotation speed increases when the moon leaves the earth is thought to be because the speed at which electrons generated in the mantle move to the ground surface increases. This is because the negative charge of the moon becomes weaker, so the speed of electron rises faster.

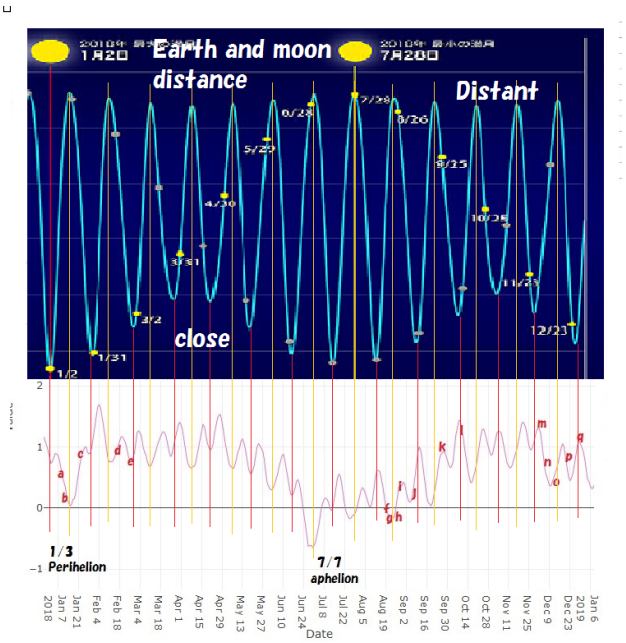

Fig 6. Relationship Between Variations of the Length of Day (LOD), the earthquakes reported in Table 1 and the positions of Afelio and Perielio, Earth and Moon distance. (https://www.nao.ac.jp/astro/sky/2018/01-topics02.html)

Pay attention to f, g, h, j, and o. These epicenters are relatively deep. The phase transition of olivine becomes direct current and flows into the magma belt in the Pacific volcanic belt. Since the current of the Faraday motor increases, the rotation speed also increases. The letters l, m, q occur when the moon approaches the earth, and the depth of the epicenter is 40km to 60km. At this depth, gravity has not yet occurred, so it can be inferred that a discharge is caused by the collision of an electron that travels to the surface with centrifugal force and an electron that repels the moon's charge. It seems that a, b, c, d, and e are also related to the moon and the sun, but it is still too early to find the cause immediately. Sufficient consideration will be required. In addition, it is necessary to pursue the reason why there is no earthquake of M7 or more from March to August.

7. CONCLUSIONS

In traditional science, the electromagnetic earthquake phenomenon is explained by the piezoelectric effect of the rock, which is generated when the rock pressure compresses the rocks and high voltage is generated. The interpretation advanced in this study proposes an alternative hypothesis, based on scientific criteria and only interdisciplinary studies can confirm the validity of this theory in the future.

Earthquakes are part of the earth's activities, and are deeply related not only to the interior of the earth but also to the solar system. Although not mentioned here, earthquakes are also affected by ionospheric conditions. Just as the moon and the sun are related to the behavior of electrons inside the earth, the state of the ionosphere also affects the electrons. For example, when a large amount of protons reach the ionosphere due to solar flare, the positive charge in the ionosphere increases, so electrons inside the earth will begin to rise rapidly. Solar activity also has a major impact on earthquakes.

L	Day/Time	Latitude	Longitude	Depth (Km)	M
q	2018-12-29 T03:39:09.740	5,8983	126,9209	60.2	7
p	2018-12-20 T17:01:55.150	55,0999	164,6993	16.5	7.3
o	2018-12-11 T02:26:29.420	-58,5446	-26,3856	133	7.1
n	2018-12-05 T04:18:08.420	-21,9496	169,4266	10	7.5
m	2018-11-30 T17:29:29.330	61,3464	-149,955	46.7	7.1
l	2018-10-10 T20:48:20.100	-5,7012	151,2046	39	7
k	2018-09-28 T10:02:45.250	-0,2559	119,8462	20	7.5
j	2018-09-06 T15:49:18.710	-18,4743	179,3502	670.8	7.9
i	2018-08-29 T03:51:56.100	-22,0295	170,1262	21.4	7.1
h	2018-08-24 T09:04:08.250	-11,0355	-70,8284	630	7.1
g	2018-08-21 T21:31:47.600	10,7731	-62,9019	146.8	7.3
f	2018-08-19 T00:19:40.670	-18,1125	-178,153	600	8.2
e	2018-02-25 T17:44:44.140	-6,0699	142,7536	25.2	7.5
d	2018-02-16 T23:39:39.280	16,3855	-97,9787	22	7.2
c	2018-01-23 T09:31:40.890	56,0039	-149,166	14,06	7.9
b	2018-01-14 T09:18:45.540	-15,7675	-74,7092	39	7,1
a	2018-01-10 T02:51:33.290	17,4825	-83,52	19	7,5

Table 1. Earthquakes Magnitude ≥ 7. Reported in the study of Fig.6.

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