

Earthquakes and volcanic eruptions as macroscopic quantum jumps in zero energy ontology

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Abstract

This article describes a quantum model of earthquakes and volcanic eruptions as macroscopic quantum jumps “big” (ordinary) state function reductions as opposed to “small” state function reductions identified as counterparts of weak measurements. The occurrence of these phenomena correlates strongly with sunspot minima, cosmic rays seem to induce them but quite too deep below the Earth’s surface, and electromagnetic activity in upper atmosphere precedes rather than follows these phenomena as one might expect. Zero energy ontology based view about macroscopic quantum jumps predicted by TGD explains these paradoxical looking findings.

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1 Introduction

The understanding of Zero Energy Ontology (ZEO) has developed rapidly after I learned about direct experimental evidence for the prediction that the big state function indeed involves a change of arrow of time. This led to the understanding of Libet’s strange findings about active aspects of consciousness challenging free will in standard ontology and to the realization that remote metabolism provides a universal purely thermodynamics mechanism of metabolism [L4].

Also the understanding of the differences between TGD based and Maxwellian views about magnetic fields has increased dramatically. In TGD the magnetic field are of two types. Flux tubes carrying monopole flux are not possible in Maxwell’s theory and no current is needed to create them. The flux quanta which do not carry monopole flux are also possible but require currents. Monopole flux tubes solve several magnetic mysteries such as the existence of magnetic fields in cosmological scales not allowed by the standard model, the maintenance problem of the Earth’s magnetic field [L1], and the mysterious magnetic field of Mars, which does not seem to exist except via Auroras and seems to have roughly the same dipole strength as the Earth’s magnetic field [L5]. This changes totally the view about geological evolution of Mars and about prospects for life possible in the interior of Mars.

In the sequel I apply this picture to develop a quantum model of earthquakes and volcanic eruptions as macroscopic quantum jumps “big” (ordinary) state function reductions as opposed to “small” state function reductions identified as counterparts of weak measurements [L2]. The occurrence of these phenomena correlates strongly with sunspot minima, cosmic rays seem to induce them but quite too deep below the Earth’s surface, and electromagnetic activity in upper atmosphere precedes rather than follows these phenomena as one might expect.

These paradoxical findings serve as guidelines leading to a model based on zero energy ontology predicting a change of the arrow of time in “big” (ordinary) state function reductions and a

connection with findings of Minev et al [L4] and Libet's findings [J1] about active aspects of consciousness emerges. There are good reasons to expect that the change of arrow of time occurs in very many macroscopic phenomena but due to ontological prejudices has remained un-noticed. These catastrophes provide also support for the notion of dark magnetic body as flux tubes carrying monopole flux and allow to deduce more detailed picture about the dynamics of solar magnetic field.

2 TGD based quantum model for earthquakes and volcanic eruptions

In ZEO the signature of "big" (ordinary) state function reduction is the change of the arrow of time at some level of the hierarchy of space-time sheets (selves) and one could start to search evidence for this effect. Also "small" state function reductions are possible and correspond to "weak" measurements. I did not however have the change of the arrow of time in mind when I encountered a highly interesting article "*Cosmic-solar radiation as the cause of earthquakes and volcanic eruptions*" by Jamal Shrair (see <http://tinyurl.com/y3g3khtd>) telling about the findings related to earthquakes and volcanic eruptions challenging the rational mind making its deductions in standard ontology.

1. The occurrence of earthquakes up to 34 kilometers below the surface of Earth and volcanic eruptions up to 9 km below the surface has strong correlation with the sunspot minima (solar activity) and cosmic ray flux. One could think that the system consisting of tectonic plates or magma is critical and sensitive to small perturbations. But how do the cosmic rays get so deep in Earth interior without losing their energy?

TGD based answer is simple. During sunspot minimum the dark monopole part of the magnetic field of Sun is strong and the charged particles of solar wind arrive along the flux tubes and by reconnection end up to the flux tubes of the Earth's dark magnetic field (van Allen belts) and along them to the interior of Earth, where they end up to quantum critical system formed by magma or tectonic plates and induces the eruption of earthquake.

2. This however requires that the number of dark monopole flux tubes is large during sunspot minima. Sunspots would be formed in reconnections of very long U-shaped monopole flux tubes coming from Sun and carrying solar wind as dark particles. This would reduce the number of monopole flux tubes but generate ordinary magnetic field by creating currents creating them - monopole flux tubes do not need any current. Therefore the number of monopole flux tubes would be maximal during sunspot minima.

Quite generally, cosmic rays would arrive to Sun along monopole flux tubes of flux tube network [L6] connecting galaxies and having flux tubes of stellar objects as sub-tangles and continue from Sun to Earth. The highly energetic dark cosmic rays preserving their energy as dark particles could end up to the Earth interior along monopole flux tubes and could induce eruptions and earthquakes. This mechanism would also take dark ions of solar wind to underground oceans in Earth interior in the model of prebiotic life [L3].

Consider now the observations in this framework.

1. In the model of Japanese researchers led by Toshikazu Ebisuzaki cosmic muons are assumed to induce volcanic eruptions. The assumption is that solar magnetic field repulses cosmic rays. When it is weak as believed to be during solar minima, the cosmic rays can arrive to Earth. Volcano would act as a volcanic bubble chamber in which the cosmic rays induce a phase transition (see <http://tinyurl.com/y3d52r7c>). The model however considered only the eruptions not deeper than 10 m below surface rather whereas most eruptions occur at depths up to 10 km. The objection is obvious: for the cosmic muons as ordinary particles it is difficult to get so deep into the interior.
2. NASA researchers reported that earthquakes are preceded by large fluctuations of densities of electrons and other charged particles in the upper part of atmosphere. Perturbations are detected at heights 100-600 km above Earth's surface. For Earth quakes the depths vary

down to 35 km. If cosmic rays induce the earth quakes, one would expect that the time order as indeed proposed by NASA researchers in their model. The problem is that electric perturbations precede the earthquakes rather than vice versa.

Here ZEO comes in rescue: The time order was indeed opposite. Macroscopic quantum jump of a quantum critical system took place changing the direction of time. There is precise analogy with the findings of Mineev et al in atomic systems showing that a deterministic and smooth time evolution seems to lead to the final state of quantum jump [L4] [L4]. The time evolution however has opposite arrow of time and starts from the final state. Libet's findings [J1] have the same explanation in terms of act of free will realized as state function reduction. Now the "big" state function reduction would correspond to the earthquake/volcanic eruption and would be induced by cosmic rays serving as stimulus. The bad news is that when the electromagnetic fluctuation are detected, the quantum jumps has already occurred and nothing can be done to prevent the catastrophe.

3. In Maxwellian picture one expects that the magnetic pressure of solar magnetic field is minimum during sunspot minimum: just the opposite is true as experiments show (see <http://tinyurl.com/y3g3khtd>! The stronger the solar minimum the stronger the magnetic pressure. This is indeed the case in TGD picture if the detected magnetic field corresponds to the sum of magnetic field associated with monopole flux tubes and ordinary flux tubes! This is what the QFT limit of TGD predicts since spacetime at this limit carries the sum of induced fields associated with the sheets of the many-sheeted space-time.

These findings inspired the proposal of the article that motivated these comments (see <http://tinyurl.com/y3g3khtd>): the magnetic pressure of solar wind could induce the earthquake/volcanic eruption somehow but leaves the detailed mechanism open. In TGD this assumption is not needed. The dark cosmic rays from the monopole flux tubes of solar magnetic field reconnected to with similar flux tubes of the Earth's magnetic field would travel along them to the interior of Earth.

4. The article of Shrair also mentions earth lights, which are luminous phenomena associated with the lines of tectonic activity. I have proposed already earlier an explanation in terms of dark photons liberated from the regions with high tectonic stresses. These dark photons could be phase conjugate photons with non-standard arrow of time accompanying mini earthquakes already occurred with respect to subjective time. Even bigger earthquakes could be in question if the irradiation of phase conjugate dark photons with non-standard time direction continues for a long time after the earthquake, which will happen in our geometric future.

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