

Interactive comment on “Long-term magnetic anomalies and its possible relationship to the latest Greater Chilean earthquakes in the context of the seismo-electromagnetic theory” by Enrique Guillermo Cordaro et al.

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Received and published: 3 January 2021

Dear referee #2

Thank you very much for your comments and suggestions. After reading carefully, we have considered adding the most recent references to Varotsos in our manuscript. However, we have two major concerns for a relevant inclusion of the VAN and Natural Time method in our work. We, as a group made up of experimental physicists, seismologists, and space physicists, place special emphasis on external disturbances

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and the fundamental physics of the phenomenon. For example, external disturbances can come from sources so diverse that they can cover frequencies of several orders of magnitude. For example, solar storms that affect the earth in a heterogeneous way, continuous magnetic pulsations Pc1-Pc5, local irregular pulsations (Pi1-Pi2) or resonances such as Schuman, among others ... Unfortunately, the VAN or Natural Time methods do not concretely incorporate this extremely sensitive information, which can lead to false positives, statistical errors and misinterpretations (eventually, this is the major criticism of the seismological community towards the VAN method).

On the other hand, the physics of the solid state that describes the propagation of impurities in a suitable geological environment began to be developed in the 40-50 decade with Zener and Stroh through the concept of dislocations and micro fractures. This theory has been proven countless times using experiments on rocks that generate electrification (Pressure Stimulated Currents). Additionally, it is well known that the number of fractures within rocks increases as stress approaches a critical point, since the material begins to collapse internally once it cannot resist the added stresses. However, the VAN model proposes a reorientation of electric dipoles instead of considering charge transport through fractally propagating fractures in hydrated rocks.

Therefore, it seems to us that both the methodology, the physical modeling, and the real implementation of the VAN model are insufficient to be considered relevant for this work according to our criteria since they were not pioneers (80s), there is no correct implementation external disturbances (dst, kp, AE, etc „), nor are they based on well-established physics.

Later, if the referee wishes, we can add this into the discussion section to raise the differences between methods. However, we consider that the VAN method would be valuable for discussion if they deepened the Zener-Stroh mechanism as a physical mechanism and were guided by the theoretical development of Venegas-Aravena et al., 2019.

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Best regards

P.V.-A. on behalf of the authors.

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2020-354>, 2020.

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