

Interactive comment on “Analysis of geomagnetic measurements prior the Maule (2010), Iquique (2014) and Illapel (2015) earthquakes, in the Pacific Ocean sector of the Southern Hemisphere” by Enrique G. Cordaro et al.

Enrique G. Cordaro et al.

ecordaro@dfi.uchile.cl

Received and published: 1 April 2019

Dear Referee # 1

The referee makes explicit that the section devoted to Fourier analysis, both in Fourier spectrum analysis and spectrograms, is not convincing and suggests excluding it from the document or rewriting it. Based on this indication we will emphasize the concepts used and the data obtained. We present in Cordaro et al 2018 the variation rate of the geomagnetic stiffness cut between the years 1950 and 2010, this analysis we

C1

found that the study of the vertical component of the magnetic field was necessary to study the seismic movements occurred in this area of the planet. Especially the behavior of the horizontal component, its first and second derivatives, before, during and after these events, their values and changes. we use as a method of analysis, the Fourier transform to calculate the frequencies for the events of Maule (2010), Sumatra (2004) and Tohoku Japan 2011., finding significant frequencies, which upon applying this method, we obtain for the events de Maule (2010), Iquique (2014) and Illapel (2015) presented in this paper, we would like to emphasize that in the Fourier Analysis of the second derivative of the Bz component we obtained the significant frequencies of the order of the microhertz prior to the seismic movements , corroborated by the low values of the Kp indices for the periods of seismic events in Iquique, Maule and Illapel. The periods of time considered that have not been explained in Figures 3 (a, b, c) have been considered and included.

In the analysis of spectrograms for the various events, they show reductions in the magnitudes of the low frequency between 0.01-1 mHz after the seismic events, indicating that the spectrogram recorded in Illapel presents an increase in the range of low frequencies between two dates. We have used daily averages for the period to be considered, moving these averages over a distance of several days in order to cover 80% of the data. Originally this analysis was carried out for the periods that included the seismic events of Maule (2010) Sumatra (2004) and Tohoku Japan (2011). Presented in the spectrogram of figure 4. In the detected and recorded data in the magnetometers in the observatories (Cosmic Radiation and Geomagnetism) located from equatorial to Antarctic zones along the Chilean coast show for each component of the magnetic field the changes of the intensity in each station during 3 or 4 hours after sunrise and 1 0 2 hours after sunset, even for those outside of SAMA (South Atlantic Magnetic Anomaly), which are the periods when the magnetic field is modulated by the traffic from day to night and night to day, also analyzing the increase in the rate of variation of particles of daytime cosmic radiation recorded in SAMA (Observation of intensity of cosmic rays and daily magnetic shift near meridian 70th in the Southameric america EGCordaro etr

C2

.. Journal of Atmospheric and Solar Terrestrial Physics 142 (2016) 72-82) We have presented in this publication as an example for September 2008 the anisotropy of the compo This is the magnetic field for all the observatories of. Putre, Cerrilos and Antarctica, with a total range of variation from 0% to 100% where it is observed that between 14 and 16 hours UTC there is a maximum intensity of the magnetic field, We indicate that this phenomenon can be explained by means of the model for the magnetopause (Birkelan 1993, Russel te al, 1999) or attributable to periods of low Dst. It also includes the daily average of the intensity of the magnetic field for all the components (X, Y, Z) in 3D of the observatories of the Pacific Ocean sector of the Southern Hemisphere with data detected every minute and a scatter of the error every two hours.

Preferably in these comments we have privileged our vision of magnetic field strength and its importance in seismic movements. On the graphs of the values of magnetic anomalies before, during and after the seismic events indicating that the detected values are obtained in magnetometers on the surface of the earth, are grounds for other comments or other publication.

Enrique Cordaro on behalf of the authors.

Interactive comment on Ann. Geophys. Discuss., <https://doi.org/10.5194/angeo-2019-9>, 2019.