Check-List for Reviewers

General Information (select YES or NO)

Does the paper contain new data or new ideas or both of them?	**Yes** No
Are these up to international standards?	**Yes** No
Is the presentation clear?	Yes **No**
Does the author reach substantial conclusions?	Yes **No**
Is the length of the paper adequate?	Yes **No**
Is the language fluent and precise?	Yes **No**
Are the title and the abstract pertinent and understandable?	**Yes** No
Is the size of each figure adequate to the quantity of data it contains?	**Yes** No
Does the author give proper credit to related work and does he/she indicate clearly his/her own contribution?	Yes **No**
Would you cite this paper as a scientific contribution?	Very important **Fairly important** May have potential No potential value after additional work and resubmission

Recommendation to the Editor

The manuscript is acceptable **as it is.**

The manuscript is acceptable with **some corrections.**

The manuscript will be acceptable after **minor revisions.**

The manuscript may become acceptable after major revisions and must be reviewed again:

I would be willing to review the paper again.

I would NOT be willing to review the paper again.

The manuscript is **not acceptable.**

Remarks for the Editor (not accessible for authors)

Comments to the Authors

The article "xxxxxxxxxxxxxxxxxxxx" by yyyyy et al., deals with an interesting topic and the dissemination of authors' results would be useful for the scientists who are focusing on the possible relation between magnetic anomalies and preparation processes of significant earthquakes.

Unfortunately, both the manuscript and most of the figures are of poor quality, "quickies". The article seems to be written hastily and carelessly, rendering it illegible, difficult to follow. The organization of the manuscript is bad and the use of English is inacceptable in most of its sections (except for the Introduction and part of the "Summary and Conclusions" section). The figures are poor and lack decent explanation. Even the dates in Fig. 6 are in Spanish! Moreover, the font size chosen is so small that makes review even more difficult.

Normally, the article in its present form should be rejected, completely re-organized and re-written and then submitted again. However, since its subject is quite interesting, I would like the authors to have an opportunity to see their work published as soon as possible. Therefore, I would advise for a major revision rather than a rejection. Nevertheless, the authors should still re-organize and re-write the paper, as well as considerably improve their figures. In case the authors decide to follow my advice, I would like to provide some more detailed points which need to be improved (although this is a very difficult task since there is no page or line numbering):

A. Manuscript format and organization issues.

A1. The manuscript should be using fonts as large as Times New Roman, 12pt. or larger, line spacing should be set to double, pages and lines should numbered.

A2. The revised manuscript should be provided in a "track changes" version too so that all changes should be clearly identifiable by the reviewers of the next review round.

A3. The last paragraph of Introduction should be re-organized: the part "The details of the methodology…from both observatories" should appropriately precede the presentation of manuscript organization. Manuscript organization paragraph should start as "The remaining of this paper is organized as follows: Section 2 presents…"

A4. Sections 3, 4 and 5 should be merged into one section under a title such as "Analysis results" or similar. Subsections could exist but only if it is meaningful. For example, it doesn't seem necessary to separate the contents of the current Secs. 4 & 5.

A5. The detailed description and evaluation of the obtained results should be moved from the "Summary and Conclusions" section to the previous (say "Analysis results") section. The final section should contain a summary only of the results and any discussions.

B. Nomenclature – notation – units of physical quantities

B1. Any abbreviations, or definitions given in the Abstract, should be given again in the main body of the manuscript at first appearance (for example: SAMA is defined in the Abstract, then used in the 2nd paragraph of introduction without definition and defined again in the last paragraph of the Introduction). Correct all similar cases, not just this example.

B2. All abbreviations should be defined at first appearance and from the specific point on the authors should use the abbreviation instead of the full name. For example: after the 1st paragraph of Sec. 2, "OP" should be used instead of "Putre Observatory" or just "Putre" throughout the document. Other example: "LARC" appears suddenly in the first paragraph of Sec. 2, while it is defined in the 2nd paragraph of Sec. 3. Correct all similar cases, not just these examples.

B3. Use conventionally the physical quantities units and the symbols of metric SI prefixes. For example: Frequency units is Hz, not 1c / xx Hrs. If you want to highlight the period, simply give the period in time units. Other example: use "m" for mili and "\mu" for micro as a prefix of frequency, e.g. "mHz".

B4. Use consistent terminology and naming in order to ease the readers. For example, in the title of the current Sec 5 you mention three earthquake events: "Sumatra", "Maule" and "Tohoku", while later you refer to the Sumatra earthquake as the "Indonesia" event. Other example: In some places you refer to the "Tohoku-Oki" while in others to the "Tohoku" event, please choose one of these names.

B5. Use consistent notation of physical variables. As an example, in some places you refer to "Rc", in others to "RC", while "R_C" is also used.

C. Use of English

C1. Please ask somebody native English speaker to help you in improving the use of English in your manuscript. I know that this is often advised to authors, even when their use of English is fairly acceptable. In your case it is a necessity, don't omit this advice. As a sample only (because it is impossible to point out all problematic parts of the manuscript) I am giving you only a few of the points to be corrected:

C2. Abstract (line 8): "Based on this, then focused our attention in the empirical…" should be "Based on this, we next focused our attention on the empirical…"

C3. Sec. 2 / 1st paragraph: should be:

"The main stations used in this study are the Putre Observatory (OP), the Los Cerrillos Observatory (OLC), and the Antarctic Observatory (LARC). The first two of them are equipped with fluxgate magnetometers and counters (with PUT and CER IAGA codes respectively). Furthermore, they are equipped with muon telescopes and neutron monitors. On the other hand, the LARC station, in addition to one fluxgate magnetometer and a type 6 NMBF3 neutron monitor, also operates two latest generation type 3 NM He neutron monitors. Two more, auxiliary, stations were used to perform magnetic measurements, the Guam and O'Higgins observatories. Table 1 provides location, atmospheric deep, instrumentation, and operation time details for all the above mentioned stations, while their location has also been marked on the map of Fig. 1 (see also Cordaro. E.G. et al. (2012) for geomagnetic rigidity cutoff and operation times)."

Table 1 should of course be updated to include information for all 5 stations. I would also advice that the information found in Cordaro. E.G. et al. (2012) should also be included in Table 1.

C4. Sec. 2/ 2nd paragraph: "The total magnetic field and his component in the magnetometers the Putrue (OP) and Los Cerrillos (OLC) observatories…" should be "The total magnetic field and its components as recorded by the magnetometers of OP and OLC observatories…"

C5. Sec. 2/ 2nd paragraph: "We have obtained tree magnetic component, north, east and vertical (Bx, By and Bz respectively), and the total component B_F." should be "We have obtained three magnetic components, north, east and vertical (Bx, By and Bz respectively), as well as the total component B_F."

C6. Sec. 2/ 2nd paragraph: "…, because we believe their behavior on the surface…". This is not a matter of faith, you should say for example: "…, under the hypothesis that their behavior on the surface…"

C7. Sec. 4/3rd paragraph. "…in Figure 4 up,…" Change to "…in Figure 4 upper panel,…" Do the same in all similar cases.

D. Unclear scientific information, technical issues

D1. Please check again the cited papers, some of the authors cited in the Introduction have more papers (recent as well as on the subject) which should also be cited.

D2. Sec. 3/1st paragraph. The text: "The values obtained show a decreasing cut-off rigidity trend between 18° S and 63° S latitudes along the Andes Mountains in the area near to Chilean trench, going through the triple junction point, all the way to the Antarctic slab." Is not possible to be identified in the map of Fig. 2. Please try to clarify both in terms of the text and in terms of the figure (e.g., by using some kind of highlight patch on the map, or some kind of highlighting polygon, or similar).

D3. In Sec. 3/2nd paragraph, you mention: "For the calculated Upper (R_U), Lower (R_L), and Effective (R_C) cutoff rigidity, we used the program development by D.F. Smart and M.A. Shea 2001". Describe the method implemented by the specific program in adequate detail so that the readers can understand the underlying theory and calculations.

D4. Sec. 3/2nd paragraph. Define and explain adequately "IGRF 1975, 1995 and 2010".

D5. Sec. 3/2nd paragraph. "The R_U values oscillated and decreased steadily; the annual variation in RC is smal (-0.0217 GV/year), while the value for R_L is -0.0200 GV/year, with a more predominant oscillation." Determine the kind of oscillation/s and predominant oscillation.

D6. Sec. 3/2nd paragraph. "Cutoff rigidity decrease is more pronounced in this area (Figure 3)." Determine geographical coordinates for the highly affected region and highlight it on the map (as suggested for the case of D2).

D7. Sec. 4/1st paragraph. The references should be in the form FamilyName (year), e.g., "Florindo and Alfonsi (1995)". Check and correct all similar cases. Also Mouël and Courtillot is not 1881, but Mouël and Courtillot (1981).

D8. Sec. 4/3rd paragraph. "…starting on November 18th, 2009…" Check date, and Fig. 4. As it is now it is not clear (might be 31 October 2009?).

D9. Sec. 5/1st paragraph. "We used the Fast Fourier Transform and Wavelet analysis methods to calculate frequency and time series…". What do you mean by "time series"? Specify.

D10. Sec. 5/3rd paragraph. There is no such thing "mobile Fast Fourier Transform". You probably refer to Short Fourier Transform (SFT) and Spectrogram. Please correct it.

D11. Sec. 5/3rd paragraph. There is no such thing "Fourier Power Intensity". The power intensity should refer to a specific physical quantity. Please correct it.

D12. Sec. 5. It is not clear what is the meaning of using both Fourier and Wavelet Transforms. It should be made perfectly clear or keep only one of them.

D13. Sec. 6/ 5th paragraph. "…the Meyer wavelet was constructed from the second derivative of Bz…" this is either wrong English or wrong understanding of wavelet transforms. Please rephrase, the wavelet is not "constructed from".

D14. Secs. 5 & 6. As already mentioned in the manuscript organization remarks (remarks "A"), the aanalysis results should be resented earlier than Conclusions section.

D15. Any "anomalies" should be at least statistically substantiated. By defining for example +/-2 sigma threshold levels and looking for any signal exceeding them.

D16. Sec. 6/8th paragraph. The whole paragraph should be re-written. The meaning is not clear.

E. Figures and figure captions, Table

E1. Table 1 should of course be updated to include information for all 5 stations. I would also advice that the information found in Cordaro. E.G. et al. (2012) should also be included in Table 1.

E2. In Fig. 2 you should use different symbol for the earthquake events and the observatories/stations (e.g., a star for earthquake events).

E3. In Fig. 3 there are no Meridians & Parallels, you should add some to improve readability of the map. The caption should be more detailed.

E4. Fig. 4 has no tick marks on the time (dates) axis, please add them. Also R^2 is not shown for the Maule event, you should add it. Moreover, R^2 is very poor for some of the shown cases. You should mention and discuss that.

E5. Fig. 5 is very poor. It should be re-designed. Also, in the figure caption, what is the meaning of "second rate"? Use the word "recorded" instead of the word "registered".

E6. Fig. 6 is also very poor, while the viewing angle doesn't help. The dates should be in the same format in all figures, the same format used in the text. Also, if you decide to use month's names, these should be in English not in Spanish or in other languages.

E7. Fig. 7 right panel is the same with the left panel, just zoomed-in since scale 1 is missing. This should be made clear in the caption of the figure. Also scales should be given in time units both in the figure and in the text.

E8. In general Figure captions should be more informative.