

Referee Report concerning NPG submission:

npg-2019-22

Title: Negentropy anomaly analysis of the borehole strain associated with the Ms 8.0 Wenchuan earthquake

Author(s): Kanguang Zhu et al.

Recommendation: Consideration Under Major Revision.

General Comments.

This is an interesting overall manuscript addressing the problem of the earthquake precursors, through the use of the so-called borehole strain method and standard statistical tools. The findings and principal outcomes of the manuscript are meaningful and important. In any case, I am afraid that the authors are ignorant of some important results in the literature (please consult the “Bibliographical Comments” below). In my opinion, the idea and realization is certainly interesting, and I recommend the manuscript for publication, if the authors address properly, or at least in a satisfactory manner the scientific and technical issues raised below.

Specific Comments: Important Remarks about the Scientific Content.

- The method of detection of anomalies of the borehole strain, is not well-known to non-specialists, and – I would say – to the specialists neither.

In my opinion, at least one additional explanatory paragraph entirely devoted to this subject is needed, in the “Introduction” Section.

- In my opinion, in Fig. 6, “kurtosis= $0.28699 \text{skewness}^2 - 0.28696$ ” should boil down to “kurtosis= $0.287(\text{skewness}^2 - 1)$ ”, I mean that in equation (9),  $A=B$  which is a Remarkable result, if it holds true !!!

At least one additional explanatory paragraph entirely devoted to this result is needed, in the “Discussion and Conclusions” Section !

- In line 153, is stated that “ $k^*=1.1130$ ”. What is the meaning of keeping so many significant digits ? Why not “ $k^*=1.1$ ” or “ $k^*=1.11$ ” ?

Please explain ! At least one additional explanatory paragraph is needed !

- In line 157, Fig.5, explain the Units !

Bibliographical Remarks.

I think the authors could find interesting – and include in their list of References – those quite old works, one of them published in NPG:

- “Extracting preseismic electromagnetic signatures in terms of symbolic dynamics.”

K.Karamanos, A. Peratzakis, P. Kaporis, S. Nikolopoulos, J. Kopanas and K. Eftaxias  
Nonlinear Processes in Geophysics 12, 835-848 (2005)

- “Study of pre-seismic electromagnetic signals in terms of complexity.”  
K. Karamanos, D. Dakopoulos, K. Aloupis, A. Peratzakis, L. Athanasopoulou,  
S. Nikolopoulos, P. Kapiris and K. Eftaxias  
Phys. Rev. E 74, 016104 – 016125 (2006)

- “Evidence of fractional-Brownian-motion-type asperity model for earthquake generation in candidate pre-seismic electromagnetic emissions.”  
K. Eftaxias, Y. Contoyiannis, G. Balasis, K. Karamanos, J. Kopanas, G. Antonopoulos, G. Koulouras and K. Nomicos  
Nat. Haz. Earth Syst. Sci. 8, 657-669 (2008)

A more recent Reference could be for instance:

- “Levy and Gauss statistics in the preparation of an earthquake.”  
S.M. Potirakis, Y. Contoyiannis and K. Eftaxias  
Physica A, Vol. 528, 15 August 2019, 121360  
(In Press)

Technical Comments and Error Corrections.

In my opinion however, the authors did not spend enough time for the preparation of their manuscript, so that plenty of Minor corrections are needed !!!

For instance:

- In line 17, “earthqake” → “earthquake” !
- In lines 26 and 27, the citation has no uniform style !
- In lines 295 and 296, of the References list, there are quotation marks in the title of the Reference. This is the only place in the whole list where this happens !
- In line 153, there are superscripts in the middle of the sentence, for no reason !
- In line 157, the end dot (final punctuation mark) is missing !
- In line 159, it is mentioned “Fig 6(a)” instead of the correct “Fig. 6(a)” (the dot is missing) !
- In line 297, “Gutenber” → “Gutenberg” !
- In line 325, the style is not uniform ! Dots are missing !
- In line 341, the style is not uniform ! Dots are missing !
- In line 349, the style is not uniform ! Dots are missing !
- In line 352, the style is not uniform !
- In line 353, the style is not uniform ! Abbreviation is missing !

I remain open to any further clarification possibly needed from the Editorial Office.

To conclude, I Recommend Consideration Under Major Revision.