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Nonlinear Processes in Geophysics
Discussions
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Interactive comment on "Mahalanobis distance based recognition of changes in the dynamics of seismic process" *by* Teimuraz Matcharashvili et al.

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The paper deals with the recognition of changes in the dynamics of the earthquake process, as it is clearly stated by the title per se, by estimating the Mahalanobis distance (MD) in Southern California, an earthquake prone area, and for this reason is important. The importance is connected with the identification of regularities in the seismicity behavior during periods of seismic excitations, whereas it turns to random – like during periods of decreased activity. There are, however, several points inside the paper that need additional work and corrections. Specific comments are reported, which I hope will contribute to the improvement of its revised version.

MAJOR COMMENTS 1. Considerable improvement of syntax and grammar is re-

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quired. In some places the reader needs to “infer” the meaning of the content. 2. Lines 91 and 92: This point is crucial for the paper and even more for the reader. It is necessary, therefore, to be more specific and more explanation to be given, how this goal will be approached and what is expected from the analysis. 3. It is important to see the details of the plots commented and determined. For example, in Fig. 3, the MD variation and the connection with the strong earthquakes, shown in the upper part of the figure. 4. Lines 301 – 302: “. . . we observed two separate processes prior and after main shocks . . .”. Is this observed only in the case of the strong earthquakes’ occurrence or not? And how it could be determined in the cases that the same pattern is met without a strong earthquake occurrence? 5. Lines 322 – 323: Why did you chose this period and not repeat the exercise for all M6.0 earthquakes shown in Figure 3? 6. In Figure 7, the increase around 12300 is also profound, as before the M6.1 event. How do you determine that? 7. Line 340: earthquake of M5.23, a moderate magnitude event. Could you chose and suggest a threshold for the strong events, which for the pattern is seeking? Could you present then the catalog of all these events and for which the pattern is observed and is statistically significant? 8. Line 345: “. . . is strongly different from random process . . .” Could you clarify this statement in relation with details in Figs 7 & 8? 9. Fig. 8: How is the pattern before and after the M5.23 earthquake and how is it explained? 10. Fig. 8: What happened before and after the M7.1 earthquake, how is it determined and how is it compared with the corresponding behavior connected with the M7.3 of Fig. 7? 11. Lines 362 – 365: Please, clarify your statement and provide arguments to support it. 12. Line 392: “. . . 2 – 5 days period . . .” How this period has been set? This need to be supported and clearly stated how is it associated with the aftershock activity evolution.

SPECIFIC COMMENTS 1. Special caution should be paid to the citation, since a unique format is not followed. For example, in page 2 the same paper is written as: “Iliopoulos et al., 2012” and “Iliopoulos, et al. 2012”. For this citation in particular, you need to correct in line 610: Instead of “Papadimitriou, P. P.” the correct name is “Papadimitriou, E. E.”. More: when the authors names are shown inside the text

the commas should be avoided, like in lines 135 & 136: Kanamori [1977] (without a comma). Line 306: Bowman and Sammis (written properly some lines below), instead of Bowman et al. Lines 362 & 366: Please, be kind enough to correct the citation format. 2. Page 3: The map should be limited to the boundaries of the catalog – it seems now that seismicity has ceased (there is no seismicity) northern than 38 degrees for example, or to the west of -122 degrees. 3. It could be of broad interest and concern of many readers to see why the authors did not prefer to use seismic moment, which is nowadays routinely estimated, instead of seismic energy. 4. Syntaxis in many places needs substantial review, for the text to be conceivable. 5. When you refer to "strong" earthquake, please, pay attention to not name them "strongest" (it is met in many places in the manuscript) 6. Lines 402 – 404: Could you make it more clear? 7. Line 476: "... 29 of such earthquakes occurred for considered period ...": What do you mean by that?

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