Natural Hazards
and Earth System
Sciences
Discussions

Interactive comment on "Measuring the seismic risk along the Nazca-Southamerican subduction front: Shannon entropy and mutability" *by* Eugenio E. Vogel et al.

Anonymous Referee #2

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I consider that the work can be published taking into account the following considerations:

The authors analyzed time series constructed with the elapsed times between earthquakes from seismic catalogues recorded on four zones of the Nazca plate. Their study is sustained by the analysis of two quantities, the Shannon entropy and the mutability introduced by Vogel et al., (2012). Concerning with the mutability, the authors do not describe neither properties nor advantages of the wlzip when its compressor is used to analyze time series, can they give information about the relationship with the numerical values of the wlzip and the underlying complexity in a time series? For instance,

if the time series is periodic, random or fractal, how the behavior of the compressor is in those cases? Regarding with the 4 chosen zones, why there were consider the epicenters of the largest earthquakes as center of each zone? (as is shown in the table I) Also, the latitudes why were selected with intervals of 4 degrees approximately? Is there some reason from a seismological point of view? The authors should explain why the zone between A and B was not considered in this analysis, I think that this region could be similar with the zone C in the sense that there is not a large earthquake during the study period.

From figure 1 and table I can be observed that Zone C is almost completely inserted within the zones B and D, so that the corresponding time series of zone C contains information of the respective B and D time series. The authors must clear how they can distinguish the joint information.

The authors wrote that the first bin in the histograms of A, B and D, in the figure 2, represent mainly the activity of the aftershocks after the larger earthquakes occurred within the respective zones. The authors must to specify the criterion that allows differentiate between the aftershocks (in terms of the position and time occurrence after a main shock) and the possible background seismicity. Also, the authors do not describe the number of earthquakes occurred during the analyzed period (2011-2017 and 2009-2017 for zone D), and not specify the number of events in their time series.

In the lower panel, In Figures 3-6, the abscissa labelled "Events" corresponds to the succession of filtered seisms identified by the same label i used to define ti, nevertheless, in order to clarify the analyzed period, the authors must specify the dates of the periods and the seisms (red stars) referred.

Regarding the comments around the figures 9-12 the authors claim: "The first comment here is evident: these 4 regions present different seismic behaviors so we have to discuss them separately". The authors only analyzed the inter-event times series, nevertheless, they have to explain clearly what do they understand seismic behavior,

because some other seismic parameters like the magnitude, or released energy which are not considered in this study.

In figures 9, 10 and 12 the authors should set up with red stars the dates that identify the date when each large earthquake occurred.

Within the text is cited (Vogel et al. (2017)) and, in the references section there are two papers of Vogel et al. (2017), the authors must to write Vogel et al. (2017a) and Vogel et al. (2017b) to avoid confusion.