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Interactive comment on "Visual analytics of the aftershock point cloud data in complex fault systems" *by* C. Wang et al.

C. Wang et al.

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Reviewer2: Wang, et al. developed an interface to easily visualize aftershock distribution in a 3D setting. They produced a Matlab GUI that allows common processing and visualization techniques when interpreting aftershock temporal and spatial distributions.

In my opinion, this paper is peculiar as it does not produce any news scientific results, but offers a new computational tool to visualize and evaluate datasets. In that sense, I am not completely sure it fits within the traditional scope of SE. Now, we have to admit that a lot of the publications on data analysis only plot the data sets in different way to describe and understand them. So I understand the need for a simple tool to do so. I

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really appreciate that the tool if freely accessible and has 1) a GUI and 2) a GUI that is easy to use. The tool is still at a prototype stage but can be already used to start analyzing real dataset, as shown in the manuscript.

Authors: Thanks for the comment. Visual analytics is considered as an outgrowth of the fields of data visualization [Pak Chung Wong and J. Thomas, 2004], which focuses on analytical reasoning facilitated by interactive visual interfaces. The visualization of seismic refraction data has already been widely applied to explore the distribution of petroleum and gas. However, to date, studies using the state-of-art visual analytics method to explore other kinds of seismic data (e.g. aftershock point cloud) to gain information about earthquakes have been lacking.

This study may be a little different from traditional earthquake research paper, because it focuses on visualization analytics method rather than traditional data processing algorithm. There are already a large number of automatic data analysis methods have been developed for earthquake data processing. However, the complex nature of earthquake problems makes it indispensable to include human intelligence at an early stage in the data analysis process. Visual analytics methods allow researchers to combine their human flexibility, creativity, and background knowledge with the data analysis capabilities of computer, to gain valuable knowledges from the complex earthquake data.

Our work proposes a novel interactive visualization method for exploring the 3D aftershock point cloud data. It is an attempt to test the potential of visual analytics methods in earthquake studies. The proposed visualization approach has been implemented in a software package (Aftershock Visualization [AFV1.0], https://github.com/caigenszu) and freely accessible to the scientific community. We believe this approach and the corresponding software package can benefit the scientific community for understanding complex fault system from aftershock data.

Reviewer2: Although the main goal of such tool is to analyze complex aftershock sequence, I would advise the authors to not neglect the educational potential of such

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approach. Additionally, point clouds can also be used for analyzing tremor migration, and for tracking aseismic slip more generally. I would be interested to see how this tool could be used for tremors too.

Authors: Thanks for the comment. We will include the description for educational potential of this visualization analysis tool. We will also discuss the potential of this tool for analyzing tremor migration, and tracking aseismic slip in the revised manuscript.

Reviewer2: Few comments: Page 1 line 25: “along the up-dip or along the down-dip” directions?

Authors: Thanks for the comment. It would be corrected in the revised manuscript.

Reviewer2: Page 2 line 9 mainshock, not “the mains shocks” Page 9 line 12 should, not “is should”

Authors: Thanks for the comment. It would be corrected in the revised manuscript.

Reviewer2: Figure 3 need labels on the x and y axes Figure 7 a colorbar would be useful for the time evolution

Authors: Thanks for the comment. The colorbar will be included for Figure 7 in the revised manuscript.

Reviewer2: The captions of Figures 3,6 and 7 should describe more what we see, so that we understand the approach and the plotted results while reading the caption

Authors: Thanks for the comment. We will include more description in the caption in the revised manuscript.

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