

Interactive comment on “Structure of massively dilatant faults in Iceland: lessons learned from high resolution UAV data” by Christopher Weismüller et al.

Anonymous Referee #1

Received and published: 30 July 2019

In the present paper, the authors studied the surficial expression of some normal faults in Iceland, mainly using UAV-derived digital surface models and orthomosaics. They classified them, based on the surficial expression, as well as they collected several quantitative measurements and provided dilation and vertical offset profiles; they also related vertical offset and horizontal dilation with the aid of field checks, to provide new findings on the above-cited topic. I generally appreciate this kind of study where plenty of data are provided and that present new approaches and technologies, and I recommend the paper for publication, but only after a major review with the aim of improving the structure of the manuscript, data presentation and to better highlight the results.

Introduction and discussion The introduction must be improved addressing in clear manner the methodology or the scientific problem presented in the paper. In the present form, there is a large list of cited literature but the subject of the paper is a bit vague. It is not clear if that is a test of a new methodology to study normal faults (e.g. UAV survey without GCPs) or if the aim is to present new findings on fault classification at the surface. Up to now, it looks somewhere in the middle. In addition, the discussion must be better addressed; the core of the paper is unclear in this chapter and it is difficult to appreciate the value of the new data and consequent results. I strongly recommend reorganizing this section after the introduction has been improved and thus the focus of the paper has been clarified. In the present form, it is hard to understand where the new findings are, regarding both the method and the scientific problem. Part of the scientific core of the paper seems to be presented in Section 1.2 that now belongs to the geological background. Geological background Sections 1.1 and 1.3 can be merged; they both describe the studied areas. Methods 2.2 Authors applied the areal Structure from Motion technique using a “border line” level of frontal and side overlap, without GCPs. This has surely affected the quality and the accuracy of the model, and must be discussed more in the paper, please do quantify the error. It also seems that the authors have not added any scale to the model/dense cloud. In addition, referencing them with lower resolution dataset could have also introduced errors. Results Sections 3 and 4 can be merged since in both of them results are presented. Conclusions This section must be better addressed in order to highlight new findings, after that the introduction and discussion sections have been both improved, as suggested above. Figures At a general level, the number of figures is too high. Some of them must be merged, especially when they are presenting the same type of data. 1. The caption can be shortened, eventually adding details in the figure. 2. North and scale are missing. Change the symbol for surveyed faults; star is often used to indicate earthquake epicenters.

Interactive comment on Solid Earth Discuss., <https://doi.org/10.5194/se-2019-117>, 2019.