

Responses to Nikolas Aleksi Ovaskainen's report.

Dear Mr Ovaskainen,

once again, the authors thank you for your work as peer reviewer. Your comments in the interactive discussion section and in report #1 have greatly helped us to improve the quality of our manuscript.

We clarified the points you raised in the manuscript and also made corrections to ensure the consistent use of British English. In the following document, you will find a point-by-point response to your comments in Report #1.

We hope that these new corrections have consistently improved the manuscript and will enable this work to be published in Solid Earth.

Kind regards,

Maxime Jamet

General comments related to prior review

> Furthermore, you should make sure you use either American or British English. Currently e.g. both "characterization" and "characterisation" are found in text.

This is still a problem. E.g. line 43 vs. 74.

We have changed it as well as in line 674. We have also modified several words in the rest of the manuscript to better fit British English.

> In terms of terminology, I think you should critically review terms related to fractures. You use e.g. "mode I fractures", "joints", "lineaments", "faults", "fractures" and "deformation structures" intermixed and sometimes in inappropriate context. Try to simplify the terminology (mode I fractures = joints?) and refer to the same features with the same terminology consistently. You should also consistently refer to azimuth sets, they are sometimes joint sets, sometimes fracture sets and sometimes orientation sets.

You have improved terminology. However, I still see some intermixed use of e.g. "orientation set" (Line 322). Please also examine of use of "joint set" is necessary on Line 685. Maybe "azimuth set" would be suitable?

We have changed these terms in agreement with your comment (lines 326 and 687).

Check Lines 24 and 393 for if "Mode I" can be replaced with "extensional open ..." as you have done elsewhere.

Thank you for bringing these oversights to our attention. We have corrected these terms (lines 24 and 396).

Regarding your response to my previous referee report part on lines 245-262 ("We understand your point of view ..."):

Thank you for the explanation but once again, I suggest letting any future readers also know your reasoning! You could add the info you provided me to e.g. section 3.1 (Lines 127-128). Explain, like you already did, why you did lineament interpretation in two scales and how the uses for the two scales differ and maybe, if suitable, why you chose not do the same analyses for both scales.

We have added information about our choices and intentions for this part of the study (lines 129-132).

Regarding your response to my previous referee report part on lines 662-683 ("For this study, we use ..."):

I think some of this explanation would fit on Lines 487-488. Also examine if the 5.1 title could be changed to better clarify the purpose of the subsection. Otherwise I believe this subsection of "intermediate conclusions" will be confusing to readers, as it was for me. Furthermore, some of the explanation you provided in your response could probably be added to the start of the "Conclusions" section.

The section 5.1 is now entitled "Results and limitations". We have specified that the results presented in this section are then discussed in the rest of the *Discussion* section (lines 491-492).

We have also modified the beginning of the conclusion by adding some of these explanations (lines 684-687).

Specific comments by line(s):

15: "its impact" -> "their impact"

Done (line 15).

47: Please clarify in the text this part: "penalizing for petrophysical properties". E.g. "... properties by draining or compartmentalizing the reservoir", not only for me!

We have clarified this in agreement with your comment (line 48).

79: "... optical borehole imagery, geophysical data ..." Should there be "and"?

Done (line 79).

132: Please add info on what resolution the basic-scale orthomosaics are, if you have the information available.

There is not only one basic-scale resolution for this orthomosaic since the used data are from three different satellite images. We cannot provide precise information on the initial-scale of the Landsat / Copernicus satellite since we do not know which Landsat generation is used by Google® to build this orthomosaic.

136: "sampling area" -> "sampling areas"

Done (line 140).

147: "... of lineament networks ..." -> "... of lineament (and fracture) networks ...". This better covers the themes of the cited publications.

We agree with your comment and have added your proposal (line 151).

160: "fracture set" is a bit misleading here. I suggest "To describe the quantity of fractures, Dershowitz ..."

We have modified it (line 164).

162: "calculates" -> "calculated". I suggest: "which allow to better ..." -> "... which allows the better comparison of their spatial distribution".

We have changed this sentence accordingly to your suggestion (line 166).

180: "lineaments set" -> "lineament set"

Done (line 184).

193-195: *You explained your reasoning well in your response but I would prefer it if, at least partly, the reasoning is included in the text to avoid the readers getting confused on where the cut-off comes from as I was before your explanation. Currently, I find the text "in accordance with other studies ... and the resolution of satellite images" to not explain it well enough.*

We have rephrased this part of the paragraph to better explain our reasoning: "Considering the resolution (0.3 m/pixel) of the images data, we have chosen a 6-meters value for truncation cut-off in accordance with other studies (e.g., Bonnet et al., 2001; Soliva and Schultz, 2008). If we consider a reasonable margin of error of 2 pixels (0.6 m) when sampling the lineaments, the length values are not truncated greater than 1/10 of their real length and this ratio decreases as the length of the lineaments increases." (lines 197-200).

205-206: *Be specific or introduce as examples. Assuming other deformation structures are mapped: "... structures such as fractures and deformation bands."*

Done (line 212).

393: *"factures" -> "fractures"*

Done (line 396).

517: *"We however have not enough data to precise these effects" -> Please rephrase. E.g. "We however do not have enough data ...".*

Done (line 520).

603: *Should it be: "relevant to analyse any correlation ..." -> "relevant to analyse regarding any correlation ..."*

True (line 606).

645: *"form" -> "forms"*

Done (line 648).

690: "host" -> "hosted"

Done (line 693).

Figure and table comments

Figure 1d: "Suposed" -> "Supposed"

Done.