

Author's response to the second review of the manuscript egosphere-2022-1183

First, we would like to highly thank the review performed by the two reviewers as well as the editor. We appreciate the time and effort everyone spent in reviewing the paper and we thank the constructive review you all performed. We think the manuscript improved from the former submission.

The annotated manuscript contains all the suggested changes and comments as well as additional changes performed to improve the final manuscript. Therefore, a detailed point by point can be tracked in that document.

In short, here is a list of the comments performed by each reviewer (Guido and Tim):

Guido's comments have been implemented in the final text and the whole manuscript went to a grammar reviewer to polish the final version of it. The only comments/suggestions that have not been partially or totally implemented are:

- **Line 124:** I think it is better to replace “caused the decrease in...” by “caused an increase in...”
 - o **Authors response:** This is constrained by the experimental apparatus simulating a domino-style basement fault system. By definition, in this kind of faults (planar rotational faults) the dip of the fault progressively decreases by counterclockwise rotation as extension progresses. This also entails an increasing of the dip in footwall and hanging wall strata as occurs in the models. So, we don't consider necessary to modify this sentence.

Tim's comments have all been implemented within the text and in case some explanation was needed, it was provided there as well. The only comments/suggestions that have not been partially or totally implemented are:

- **Line 555:** Read this and see if it makes sense – salt decouples the suprasalt strata from the thick-skinned deformation below.
 - o **Authors response:** We don't see a problem. We agree that salt decouples the supra- and sub-salt deformation, as stated throughout the manuscript, but even with that, the basement fault inversion causes the rotation and uplift of the basement blocks and this vertical motion must also be accommodated at the cover as well by either salt expulsion, by uplifting, or by the development of cover faults.

In that regard, in Fig 5d, the sub-salt deformation is accommodated by basement fault inversion and shortcut development while the supra-salt deformation is accommodated by the development of contractional salt sheets.

Therefore, we are not performing any change.

- **Line 555:** Not sure this is needed or if this is correct. You diapirs are small and would close rapidly necessitating shortening be accommodated elsewhere.

- **Authors response:** It is true that in most of the models diapirs are small and as the weakest lithology they are closed rapidly. Then contractional deformation inverts the pre-existing extensional faults (white faults in model DOM19) or new thrusts nucleate (yellow faults in model DOM9). Nevertheless, the pair of models DOM8 and DOM21 is characterized by big diapirs and shortening is accommodated by the development of contractional salt sheets and the diapirs barely close. In that sense, more shortening is needed since the salt stock is not yet secondary welded and shortening forces salt to be expelled. We have included a last sentence indicating that we have not tested this factor in our experimental program and this will be considered in future works. For this reason, we have not performed any change.

- **Line 563:** I agree with most of this, but does it need to be this long? Recent papers on the Zagros describe dual layer salt systems too. Originally the delamination intrusion was used wrongly, as it can only really happen with very weak layers... Anyways, I digress. Shorten.
 - **Authors response:** According to the reviewer suggestions we have tried to reduce the length of this section. We consider it provides necessary and useful information to the reader to understand the discussion about the role of the salt in the process of reopening salt welds. Despite the modifications made in this section, we consider that the message remains.

- **Line 583:** I don't think the above really does split these two apart very successfully. Read through it and check for yourself.
 - **Authors response:** We were probably reckless when separating two types of primary welds. As was presented, the meaning of the sentence could be misinterpreted. We simply refer to the location of those primary welds (below the ramp-syncline basins and above the basement fault). Following the comments of the reviewer and to clarify this point, we have removed the part of the sentence that could lead to misinterpretations. However, we consider that with the modifications made to the new version of the manuscript, the two types of welds according to their location and evolution are successfully described.

Again, we thank the effort of reviewing the manuscript.

Sincerely,

Oriol