

Response to reviewers (replies marked in blue)

Referee #1: Carita Augustsson

The manuscript by Stutenbecker et al. with the title “Miocene basement exhumation in the Central Alps recorded by detrital garnet geochemistry in foreland basin deposits” is an Alpine provenance study based on garnet. The authors use the produced data to reveal source areas that have not been considered before, with implications for the exhumation history in the area. I have no scientific objections to the methodology, results quality or interpretations. My comments rather consider the text structure and how to improve the figures. Therefore, I estimate that only minor modifications are needed before publication in Solid Earth can be considered.

Reply: Thank you for the thorough review. We have addressed all changes to the figures as requested. Several suggestions concerned the discussion section, because it contained some repetitions from the results section. Accordingly, we restructured the discussion and eliminated the repetitions (see further below).

Below are my main comments. More detailed comments are in the manuscript file itself. I just realised that I somehow have managed to delete all my comments (not text modifications) up til Figure 3, so I have tried to reconstruct the most important ones. . .

1. Direct references to figures in the text

The authors refer directly to figures in the normal text flow. This may cause a break in the reading. Therefore, I recommend rephrasing the text such that it rather focusses on the chemical composition of the analysed garnet than on discrimination fields in specific plots, see my example directly in the text.

Reply: We have removed these direct references as suggested.

2. Results in the Discussion chapter

Some results are repeated in the Discussion chapter. This is unnecessary. Here, only the data should be interpreted, not presented again. I have marked such result entries in the Discussion chapter with green directly in the manuscript.

Reply: We agree. We have restructured the discussion extensively based on suggestions by both reviewers. Instead of using the old structure “origin of amphibolite-facies garnets”, “origin of eclogite-facies garnets” etc. we have created the new paragraphs “Late Oligocene (~25 My)”, “Early Miocene (~19 My)” and “Middle Miocene (~14 My)”. Like this, we focus the important information in a better way and avoid the repetition and the interference of results and discussion. This new discussion is structured around the new Fig. 6, which is a summary of the paleogeography of the Central Alpine hinterland and the catchment of the Napf fan.

All other comments (n = 30) are written directly in the .doc manuscript file. This includes comments on the figures and the table. If you cannot read the file, please contact me (carita.augustsson@uis.no).

Although I am not a native English speaker, I have made some linguistic suggestions. I apologise if I have introduced any grammatical errors.

Reply: All spelling mistakes, linguistic improvements and “minor” corrections (e.g. the use of “sedimentary rock” instead of “sediment”, “Alpine” instead of “alpine”, the use of the singular mineral/rock instead of the plural, etc.) were accepted using the track changes function directly in the revised document. Please see the revised version of the manuscript for all implemented changes (including the ones from reviewer #2 and our own corrections). For the answers to the detailed comments/suggestions, see the additional supplementary file (“Answer to Comments”).