

This is a points by point review to the comments from both reviewers to the manuscript entitled „Effects of Transient Processes for Thermal Simulations of the Central European Basin“ by Degen and Cacace.

Reviewer #1 (anonymous)'s comments:

I reviewed the revised version of the manuscript of Degen & Cacace titled “Effects of Transient Processes for Thermal Simulations of the Central European Basin”. The authors addressed all the principal remarks raised in my previous revision. In this revised version, I found minor typos or language inconsistencies that should be checked.

*We would like to thanks the anonymous reviewer for his comments being glad he/she found our answers to his/her previous round of review sound and satisfactory. We have addresses all technical points (grammar and typos) as requested in this second iteration (listed below).*

Here the list referred to the lines of the revised manuscript:

1. L. 28: the second point is not clear considering the introductive sentence “which evolved through geological times”. I think that a preposition is missing.
2. Similarly, the third point could be modified. “lastly” is generally not used in lists since “and” is also present at the end of the second point.
3. 3. L. 65-68: I suggest to rephrase this sentence that has a few subordinate clauses and digressions. This would improve its readability.
4. 4. L. 177: change the reference as “(Maystrenko et al., 2013 and references therein)”.
5. 5. L. 286: “and which impact such corrections have on” it seems that a part of the sentence is missing. Please check it.
6. 6. L. 336: probably it is better to divide the sentences with “and”. In addition, the dot is missing at the end of the sentence (l.337).
7. 7. L. 337: Fig. 9b instead of Fig. 7b. In addition, “)” is missing.
8. 8. L. 363: the “in” at the beginning of the sentence should be capitalized.

Reviewer #2 (Dr. Thomas Poulet)'s comments:

I am satisfied with the content of all modifications of this revised manuscript and would therefore recommend publication after some technical corrections (that can be assessed by the editor directly).

*We would like to thank Dr. Thomas Poulet for his comments that helped increasing the readability and scientific soundness of our research. We have corrected all minor technical points raised by the reviewer in this second round (those are listed below).*

1. Firstly, the equations still need fixing. If the Laplace operator acts on the normalised space, then there are still some extra  $L_{ref}^2$  terms in equations 1 and 2. Only those in the first term of both equations should remain. The other three instances should disappear.

Thank your for pointing this out. Indeed, the formulas were wrongly written in the manuscript, and we ahve corrected those accordingly.

2. Secondly, there's a point I hadn't noticed the first time. The maps of fig.1 at 0ka and 26ka look strangely similar. Is this really true or was the same subfigure copy-pasted by mistake?

Thank you for noticing. There was indeed an error in the plot, which has now been corrected.

All language remarks have been addressed in the document.

Lastly, the English remains a bit difficult to follow at times and will hopefully be polished a little bit by the editorial team. Here are a few points regarding the modified text:

- The bullet points listed l.27-29 should make sense individually when read after l.26. A possible modification is "... which evolved through geological times due to: (1) varying thermal loading conditions ..., (2) the amount of heat ..., and, (3) lastly, the (time-varying) surficial..."
- Same comment for the sentence l.79-81. "...from the fact that the CEBS (i) represents..., and (ii) is an area of interest ..."
- Phrase segment l.100 "as higher first-order than total-order contributions" is not clear
- L.165: unclear sentence "For the ocean resolution three degree has been used"
- L.277 change "variable in time" to "time-varying"
- L.283 "no" -> "i.e. without"
- L.284 "Only after we have been able to quantify" -> "After having quantified"