

Solid Earth Discuss., author comment AC2  
<https://doi.org/10.5194/se-2021-153-AC2>, 2022  
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## Reply on RC2

Stefan Back et al.

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Author comment on "Reconstructing 3D subsurface salt flow" by Stefan Back et al., Solid Earth Discuss., <https://doi.org/10.5194/se-2021-153-AC2>, 2022

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Response to the comments made by referee #2

Dear referee #2,

thank you very much for your straightforward, constructive and positive review of the ms "Reconstructing 3D subsurface salt flow" (se-2021-153).

Here is our response to your comments:

- "Introduction, motivation for conducting the study can be addressed in a clearer way":

We currently work on a revised document in which we will address the motivation for conducting the study more clearly. We will stress that the method proposed provides insights into 3D subsurface salt flow and redistribution on basin-scale, the rise and fall of salt structures and associated depocentre development, and external forces' impact on subsurface salt movement.

- "Table 1, density", but also Young's Modulus, Poisson Ratio of Chalk:

The physical properties for the Chalk were wrong. This error was not only in table 1, the same mistake was also in the lithological model used for backstripping and decompaction. We consequently re-ran all restorations of the study with revised chalk values (from onshore NL) provided by Hunfeld et al. (2021). Please find in the attached pdf the revised table and revised model results (e.g. in figures 5; 6; 7; 8; and 10). Please note that the revised models additionally contain a change suggested by reviewer Frank Peel: surfaces that were restored to a level below zero were treated as submarine, contrasting the original model (fully subaerial restoration). Yet, the new model results are quite similar to the original restoration results.

- “present-day cumulative average density”:

Yes, this is grain density + porosity; we will make clear in the upcoming revisions.

All other suggested changes (lines 129, 144, 145, 146-147, 170-173, 210, 212) will go into the revised manuscript.

Again, thank you very much for your helpful review, particularly for exposing the mistake in our lithological model!

Best wishes

Stefan et al.

Reference: Hunfeld, L.B., Foeken, J.P.T., and van Kempen, B.M.M.: Geomechanical parameters derived from compressional and shear sonic logs for main geothermal targets in The Netherlands. TNO:  
[https://www.nlog.nl/sites/default/files/2021-12/data\\_selection\\_and\\_methods.pdf](https://www.nlog.nl/sites/default/files/2021-12/data_selection_and_methods.pdf), last access: 11.04.2022.

Please also note the supplement to this comment:

<https://se.copernicus.org/preprints/se-2021-153/se-2021-153-AC2-supplement.pdf>