Solid Earth
Discussions

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Interactive
comment

Interactive comment on "The influence of subducting slab advance and erosion on overriding plate deformation in orogen syntaxes" *by* Matthias Nettesheim et al.

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In this paper the authors show a fully coupled thermo-mechanical numerical model to investigate the effect of a curved slab advancing on overriding plate deformation and they test different erosion scenarios on the resulting topography. This coupling between 3D thermo-mechanical models and erosion is ambitious, the subject could be very interesting as it is dealing with an emblematic problem, the curved subduction zones and the syntaxes. But as it is presented now it is a bit disappointing, as the setup is presented as global, corresponding to all the observations of figure 1, with no specific case study proposed, and I find the conclusions of the paper hard to compare with a

natural case. The authors said that their setup is similar to the Cascadia subduction zone or the Alaskan plate corner (p2, line2), in that case they have to show a map of the plates boundary and of the slab geometry in these regions, so that the reader is able to compare with the model. Having worked upon the India/Asia collision zone, for me the models presented in this paper could not be compared with the Indian slab corners in the Himalayas or with the Indonesian trench smooth curvature.

I suggest 1/ to better analyze the case studies, to properly differentiate different cases as trench curvature (Andes), slab corner (Himalayas), but also sense of curvature (convex for himalayas versus concave for andes or alps), see below analogue modeling Bajolet et al., 2013. 2/ to choose 2 very different cases to model, for example trench curvature / slab corner or concave / convex curvature. Remove the low convergence case (half slab advance name is not clear at all) which is of low interest according to me. 3/ show the erosion pattern for each case (as figure 9a), as it is an important issue of your work.

figures should be bigger, and better focus. Show the plates boundaries and find a way to represent slab geometry on figure 1. It will be better for the reader as it will be possible to see what you are talking about, and it will help to differentiate the kind of curvature/slab corner.

Interactive comment on Solid Earth Discuss., https://doi.org/10.5194/se-2018-14, 2018.

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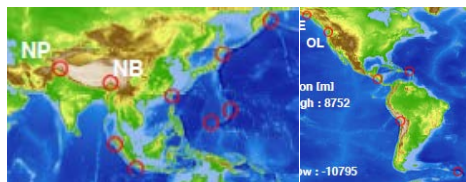

Fig. 1.