

Interactive comment on “Control of increased sedimentation on orogenic fold-and-thrust belt structure and Insights into the evolution of the Western Alps” by Zoltán Erdős et al.

Anonymous Referee #2

Received and published: 4 January 2019

This manuscript investigates the relationship between rapid synorogenic sediment filling and the development of foreland fold-and-thrust belts. It focuses in particular on the temporary slowing of thrust-front propagation, as observed in the North Alpine Foreland Basin. The results of this study are also compared to predictions of the critical taper theory. The manuscript is concise, well written and illustrated. However, I have two main questions that I would like to address:

1) The initial configuration of the numerical model is not specified. Could you please comment on why you have chosen this specific setup? And could you, if possible, give references to the Alps, i.e. extension/convergence rate, sedimentation rates, erosion

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rates, crustal geometry, etc.. Changes in model parameters are likely to alter the model results. It would be therefore useful to know why you have chosen them in the first place.

2) Are the timescales observed in the models comparable to those observed in the Alpine Foreland Basin? Please elaborate.

Other comments:

Introduction Line 7-11: What effect does synorogenic sedimentation have on the development of thin- and thick-skinned foreland thrust sheets. Please elaborate.

Numerical method: Details on the crustal thickness, extension/compression velocities, thermal gradient and the position of the weak seed and are all shown in Fig. 2, but are not mentioned in the text. Is extension instantaneously followed by compression?

Model 1: I think it could be useful to give a brief definition of pro- and retro-side.

Model 2: What are the corresponding erosion rates?

Critical taper theory: This section appears a bit unconnected to the rest of the text. I suggest to rearrange parts of it., i.e. models described in this section could be moved to the result section.

Interactive comment on Solid Earth Discuss., <https://doi.org/10.5194/se-2018-122>, 2018.

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