Solid Earth

Discussions

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Interactive comment on "Stress field sensitivity analysis in a sedimentary sequence of the Alpine foreland, Northern Switzerland" *by* T. Hergert et al.

Anonymous Referee #2

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The paper deals with the calculation of the state of stress of a narrow region in N Switzerland using detailed finite element models. In particular the authors investigate the effect of topography, boundary conditions and changes in the mechanical behavior of rocks and faults on the stress distribution. The paper is well written and surely of interest. However a few points need to be better discussed.

1) A main issue concerns the reproducibility of the results. Frankly speaking I would not be able to reproduce the results because some details on modeling are not clearly provided. The biggest problem occurs with faults. How were they treated? As slippery nodes? As discrete weakness zones?

2) The vertical variation of the orientation of the stress field in the available wells (also those out of the model area) should be better discussed. In particular the authors are

invited to relate such changes to lithology changes, if any.

3) The constraints to mechanical parameters chosen for the various lithologies should be better explained. Are mechanical parameters assigned on the basis of geotechnical analyses? The quoted papers (Boehringer et al 1990 and Nagra, 2014) cannot be reached by the scientific community.

4) The shortening/stretching imposed at the boundary conditions is chosen on the basis of agreement between model results and available information. The authors are invited to explain better this crude choice.

5) The effects of faults need to be better explained. It is unclear to me how the faults behaved after the application of the boundary conditions. Did they slip? By how much? With the same slip along the entire length? This is important to understand whether the 1-2 km radius of perturbation by faults of the stress field is reasonable or not and whether these figures could be extrapolated elsewhere.

Interactive comment on Solid Earth Discuss., 7, 711, 2015.