

Interactive comment on “3-D geomechanical modelling of a gas reservoir in the North German Basin: workflow for model building and calibration” by K. Fischer and A. Henk

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The paper is general interest to the hydrocarbon or geothermal community and describes advances in large scale 3D geomechanical modeling. It is very well written, clearly structured and the supporting graphics are of high quality. It is definitely worth being published in SM. From a rock mechanical point of view there are several questions about this paper which might be addressed by the authors: 1. They apply displacements at the boundaries for generating the stresses inside the model. What are the magnitudes of those boundary displacements? Why is it not suitable to use far-field stresses as boundary conditions? From my (limited) modeling experience the free

C320

surface moves upwards when applying external, compressive displacements. 2. The material parameters used in the model are all rock properties. The Modulus data from e.g. Eissa and Kazi apply only for intact rock. A fractured rock mass has a significantly lower Young's Modulus. The same apply for cohesion and friction (Fig. 1). Why is it necessary to include strength parameters when elastic stress modeling is executed and where do the input data come from? 3. A main goal of the 3D modeling is the evaluate stress perturbations around faults. The calibration o the model relies on (p.3, line 2) on various fracture measurements; it might be explained what is meant by this. Overall it is an excellent paper and I congratulate the authors for their outstanding work.

Interactive comment on Solid Earth Discuss., 5, 767, 2013.

C321