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Interactive comment on “Three-dimensional phase-field study of crack-seal microstructures – insights from innovative post-processing techniques” by K. Ankit et al.

Anonymous Referee #1

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The manuscript "Three-dimensional phase-field study of crack-seal microstructures - Insights from innovative post-processing techniques" by K. Ankit, M. Selzer, and B. Nestler does not contain new physics or new models in the applied area (within the scope of Geoscientific Model Development) . Moreover, there are no connections to the previous results presented in Ref. [Urai et al 1991]. That means no results about the dependency of the tracking efficiency on the angels of the crack surface are presented. The used random crack surface does not have any characteristics from which the tracking trajectory and the tracking efficiency can be analyzed (see Ref. [Urai et. al 1991]). The coarsening process in the paper is only a standard microstructue evolution simulated by a standard phase field model. The kinetics of coarsening should

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depend on the thermodynamic parameters, but in the paper there are no real thermodynamic parameters. Furthermore, the coarsening should depend on the kinetics of the crack propagation, but there are no representative results in the paper. Moreover, the coarsening in the paper does not depend on the crack propagation kinetics after any time for both cases A and B. The results in the manuscript show that the tracking efficiency does not depend on the crystal orientations, too. It can be caused by the wrong parameters. There are not enough data for the validation of the anisotropic model.

I would not recommend the paper for the publication in the geophysics journals.

P.S. Additionally, as I know, the name and surname of the first author is exchanged (swapped?).

Interactive comment on Geosci. Model Dev. Discuss., 7, 631, 2014.

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7, C538–C539, 2014

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