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Interactive comment on "A new mixed-mode fracture criterion for large scale lattice models" *by* T. Sachau and D. Koehn

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Thanks for the review!

We answer your questions and suggestions point by point below:

- Showing the results of the simulations for the stress based fracture criteria would be indeed a good addition to Figure 7. If the editor agress, we will add these results to the Figure.
- We plan to include a short summary of the work of Mora, Wang and Alonso-Marroquin in the introduction of the next revision.
- We don't expect that rotational modes are relevant factors for the discussion of

the fracture criterion, for the following reasons:

– The fracture criterion is based on shear and tensile strain energy of single lattice elements, which are functions of the shear and normal stress of these element. Both types of stress/strain are considered in the model. Including deformation modes beyond the strictly necessary ones would needlessly complicate the discussion at this point.

The role of torsion and bending of lattice elements would be an interesting discussion in a more general paper, where the shape of fracture surfaces is compared between different lattice models.

– It is necessary to differ between the fracture criterion and the elastic deformation modes of lattice elements. Wing cracks, which have been mentioned in the review, are a good example for this point. Wing cracks are mode I/tensile features, which develop under compression. Wang Alonso-Marroquin (2009) discuss wing crack formation in lattice structures with and without rotational modes. They used a standard setup for wing crack eperiments, consiting of a penny shaped predefined crack surface, which is oblique to the direction of compression. Only if the model considers torsion and bending of elements, a wing crack develops. However: the *fracture criterion* is *the same* in all experiments. Only the mode of deformation of lattice elements has changed.

– The experiments in the paper apply external uniaxial extension to the lattice, which is far less prone to cause folding and bending than compression experiments.

In our opinion this discussion should'nt be included in this paper, in order to keep it focused.

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