Solid Earth Discussions

Solid Earth Discuss., referee comment RC2
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Comment on se-2021-51

Jessica McBeck (Referee)

Referee comment on "Roughness of fracture surfaces in numerical models and laboratory experiments" by Steffen Abe and Hagen Deckert, Solid Earth Discuss., https://doi.org/10.5194/se-2021-51-RC2, 2021

Abe & Deckert produce fracture surfaces in DEM models and laboratory experiments on sandstone and limestone. They measure the roughness of these surfaces with a variety of metrics. They find an insignificant influence of confining stress on fracture roughness, and self-affine numerical and laboratory fractures. One key finding is that biaxial loading produces greater roughness than triaxial loading. However, the manuscript does not adequately explain why this difference in loading would produce the difference in roughness. Throughout the manuscript, there are a few other interesting results that would benefit from additional mechanical explanation. For example, comment #9: why do the natural rock samples have different ranges of roughness in the slip-parallel and -perpendicular directions?

I suggest that this manuscript may be published after the authors provide more thorough explanations of their results. More detailed comments are in the attached PDF.

Best,

Jess McBeck

Please also note the supplement to this comment:
https://se.copernicus.org/preprints/se-2021-51/se-2021-51-RC2-supplement.pdf