

Interactive comment on “The hydraulic efficiency of single fractures: Correcting the cubic law parameterization for self-affine surface roughness and fracture closure” by Maximilian O. Kottwitz et al.

Randolph Williams (Editor)

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Please see these additional comments from reviewer #2 on the revised version of this manuscript, which were sent to me via email.

* Line 299: this parametErization" → spurious E.

* Lines 300-301: I have the feeling that the message "fluctuations of the flow behavior have to be taken into account" is not exactly proper. If L_c is on the order of some scales in the DFN then the DFN's permeability can simply not be computed as the product of

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the permeability of the corresponding parallel plate DFN (where each fracture is replaced by the parallel plate of identical mean aperture) and a factor accounting for the mean permeability reduction due to roughness. Precisely due to changes in network SCALE flow connectivity (in you sentence on line 302 "scale" is missing between "network" and "flow").

* Line 224: my comment was not about the boundary conditions but more about the fact that the smallest dimension is along the fracture aperture and therefore it is along that direction that the highest shear occurs. So it is the discretization across the aperture that matters most when solving numerically.

* Lines 251-253: it is also because at small L_c/L the in-plane tortuosity acts at a scale that is not much larger than the scale at which the vertical tortuosity acts. In-plane flow channeling has a much reduced impact on transmissivity, and thus vertical flow tortuosity has relatively more impact.

Interactive comment on Solid Earth Discuss., <https://doi.org/10.5194/se-2019-190>, 2020.

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