

PERMEABILITY OF SELF-AFFINE FRACTURES

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The permeability of self-affine fractures with vanishing to moderate apertures and various roughness exponent H is investigated by direct three-dimensional numerical simulations. A scaling behavior with exponent H is exhibited in the self-affine scale range.

Permeability is shown to be related by power laws to the sample size and to the fractional open area, but no critical transition is observed. It can also be directly related to the mean aperture and to the percolation probability.