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Non-Local Flow Description for Non-Space-Stationary Fractured Formations

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Flow in fractured porous media plays an important role in applications ranging from geothermal energy production to the selection of suitable underground CO₂ storage sites. Predictions of flow and transport are central in these applications and often times corresponding models are applied that rely on effective permeabilities. In subsurface formations, where fractures extend over distances comparable to the scale of interest, such models are no longer suitable. As an alternative, a model based on conductivity kernels has recently been proposed. This model accounts for the non-local character of long-range flow conduits or fractures leading to a description, which is based on an integro-differential equation. In this work, this model is extended for non-space stationary fracture statistics with model predictions being successfully compared against fracture-resolving reference simulations.

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References

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Primary author: CAO, Shangyi (ETH Zürich)

Co-authors: STALDER, Daniel; MEYER, Daniel (Institute of Fluid Dynamics, ETH Zurich); JENNY, Patrick

Presenter: CAO, Shangyi (ETH Zürich)

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