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ROCK ABSOLUTE PERMEABILITY ANALYSIS USING IMAGE-BASED DIRECT PORE-SCALE SIMULATIONS

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The direct numerical simulations (DNS) experience of pore-scale flow is still relatively scarce and laborious due to the numerous practical challenges. They include typically huge model size and high computational expenses, some uncertainties in geometrical description related to resolution size and other factors remaining much in common for single and multiphase flow cases. Sometimes this makes challenging an unambiguous definition of rock permeability based on numerical simulations.

The advantage of DNS comprises the ability to model in detail dynamic physical fields interaction in “real” pore volume (and/or solid matrix) geometry. In our current work we address the incompressible steady single-phase flow in voxel-based geometry of 3D real rock image (more precisely, stack of images) with the main objectives to analyze and quantify the impact of image processing workflow on permeability computation.

References

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