

Simulations in large tridimensional Discrete Fracture Networks (DFN): II. Flow simulations

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We start this presentation by assuming that a model and a mesh of the DFNs have been computed*. We focus here on the numerical methods to solve efficiently single-phase flow problems.

We will present the software **NEF-Flow** dedicated to solving single phase flow in large scale DFNs. **NEF** stands for Numerical Experiments involving Fractures. The software **NEF-Flow** is written in Matlab and implements the mixed-hybrid finite element method in an optimized way, using vectorization to decrease the computational time. It handles either matching or non-matching meshes at the intersection between fractures, sink/source terms and contrasts in transmissivities.

A large set of benchmark test cases will be presented. Typically, we extended those proposed in [1, 2] to DFNs generated with the UFM framework [3, 4]. These DFNs are large scale DFNs where the fracture size distribution matches the observations and where fractures are organized so that large fractures inhibit the smaller ones, creating T-termination configurations. They may contain hundreds of thousands of fractures. Hydraulic properties will be computed efficiently on these networks.

*See Laug *et al.* *MASCOT 2018 abstract, Simulations in large tridimensional Discrete Fracture Networks (DFN): I. Geometric modeling and mesh generation.*

References

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