AN EXTENDED FINITE ELEMENT OPTIMIZATION METHOD FOR SIMULATING DISCRETE FRACTURE NETWORKS FLOWS

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Abstract. We investigate a new numerical approach for the computation of the 3D flow in a discrete fracture network that does not require the solution of partial differential equations on complex 3D system of planar fractures. The discretization within each fracture is performed independently of the discretization of the other fractures and of their intersections. Independent meshing process within each fracture is a very important issue for practical large scale simulations making easier mesh generation and parallelization. Some numerical simulations are given to show the viability and efficiency of the method.

Key words. Fracture flows, Darcy flows, discrete fracture networks, optimization methods for elliptic problems, uncoupled large scale simulations

AMS subject classifications. 65N30, 65N15, 65N50, 65J15

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