

SCIENTIFICI PRESENTATIONS

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1. Flow in 3D Discrete Fracture Networks. Natural fractured media are highly unpredictable because of existing complex structures at the fracture and at the network levels. Fractures are by themselves heterogeneous objects of broadly-distributed sizes, shapes and orientations that are interconnected in large correlated networks. We generate stochastic discrete fracture networks and run numerical flow simulations, using a mixed finite element method. We achieve large scale simulations by using appropriate numerical libraries and parallel computing.

A paper is in preparation. Thesis of H. Mustapha (2005) and B. Poirriez (started in 2007).

2. Reactive transport : coupling geochemistry and advection-diffusion models. Reactive transport models are complex non-linear PDEs, coupling the transport engine with the geochemical operator. We discuss efficient and robust global numerical methods, based on DAE solvers, combined with a Newton method using a powerful sparse linear solver. Numerical experiments show the performances of the method.

A paper is submitted and a paper is in preparation. Thesis of C. de Dieuleveult (2008).