

# **A simulation technique for density-driven flow in porous media with complicated fracture networks**

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In the talk, we present a discretization and numerical solvers for a model of density driven flow in a fractured porous medium. The flow is described by the Darcy law, in particular with the Forchheimer correction. The fractures are considered to be filled with an essentially more permeable porous medium as the bulk medium. These fractures are represented by low-dimensional manifolds with their own functions for the solution. The solution in the bulk medium may have jumps over the fractures. For the discretization, the manifolds are resolved by the grid and filled with degenerated grid elements. This enables to place several degrees of freedom at every geometric point and therefore to represent the jumps. This technique allows to consider all possible configurations of intersecting fracture in 2 and 3 dimensions. The coupled system of the discretized equations for the bulk medium and the fractures is solved using multigrid methods.