EFFICIENT NUMERICAL COMPUTATION OF TWO-PHASE FLOW IN POROUS MEDIA

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Abstract

Incompressible two-phase flow in porous media is modelled by a set of two coupled and highly nonlinear partial differential equations of elliptic/degenerate parabolic type. Special emphasis is put on the treatment of heterogeneous capillary pressure within a fully-coupled solution approach. I will address the topic of accurate discretization by discontinuous Galerkin methods, the efficient solution of the arising linearized systems by means of algebraic multigrid methods and finally the aspect of high-performance parallel computing. All methods have been implemented in the Distributed and Unified Numerics Environment (DUNE).