Contribution ID: **449** Type: **Oral 20 Minutes**

Numerical recipes for problems involving highly contrasted capillary pressures

Tuesday, 15 May 2018 11:17 (15 minutes)

This contribution deals with numerical simulations of immiscible two-phase flow in heterogeneous porous media. The hydrodynamic properties of the geological porous media are naturally discontinuous at the Darcy scale, which has to be accounted for by discretization methods. In this talk we focus on handling extreme heterogeneities in the capillary pressure/saturation relation arising, in particular, in the context of flow in fractured media. In order to properly account for saturation jumps at the rocktype interfaces the supplementary unknowns are introduced at such interfaces. We investigate and compare two strategies for solving the discretized two-phase flow equations. The first approach, suitable for cell-based finite volume methods, relies on the nonlinear elimination of the interface dofs, which will lead us to prove existence and uniqueness (in a certain sense) of solution to the local interface problem. The second approach is based on a judicious choice of primary unknowns at the interface. It does not requires the elimination of the interface dofs, and thus can be extended to vertex-based methods.

References

Acceptance of Terms and Conditions

Click here to agree

Primary authors: AGHILI, Joubine (University Côte d'Azur, LJAD-Inria-CNRS); BRENNER, Konstantin (LJAD, Université de Nice Sophia Antipolis); HENNICKER, Julian (University of Geneva); MASSON, Roland (LJAD)

Presenter: BRENNER, Konstantin (LJAD, Université de Nice Sophia Antipolis)

Session Classification: Parallel 4-F

Track Classification: MS 2.21: Advances in the numerical modelling of multiphase flow and transport in highly heterogeneous porous media