A posteriori error estimates, stopping criteria, and adaptivity for a two phase flow with exchange between phases as a nonlinear complementarity problem

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Abstract

We develop an a posteriori-steered algorithm for the two-phase compositional flow with exchange of components between the phases in porous media. The discretization relies on the backward Euler scheme in time and the finite volume scheme in space. The resulting nonlinear system is solved via an inexact semismooth Newton method treating the phase transition. Numerical experiments are given for the semismooth Newton-min algorithm and the GMRES solver, showing good quality of the estimates and of the adaptive stopping criteria.

Figure 1: Example of a figure