

Abstract Submitted
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Stable and unstable waves in two-phase porous media flow KIMBERLY SPAYD, MICHAEL SHEARER, ZHENGZHENG HU, North Carolina State University — Plane waves for two phase flow in a porous medium are modeled by the one-dimensional Buckley-Leverett equation, a *scalar* conservation law. We analyze stability of sharp planar interfaces to two-dimensional perturbations, which involves a *system* of partial differential equations. Linear stability analysis, in a more general regime than the classical Saffman-Taylor analysis, results in a description of the dispersion relation to leading order in the wave number, providing a criterion that distinguishes between interfaces that are long-wave stable and those that are not. Numerical simulations of the full nonlinear system of equations, including dissipation and dispersion, illustrate the analytical results.

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