A Numerical Method for a Model of Two-phase Flow in a Coupled Free Flow and Porous Media System

(Invited Talk #15)

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We study two-phase fluid flow in coupled free flow and porous media regions. The model consists of coupled Cahn-Hilliard and Navier-Stokes equations in the free fluid region and the two-phase Darcy law in the porous medium region. We propose a Robin-Robin domain decomposition method for the coupled Navier-Stokes and Darcy system with the generalized Beavers-Joseph-Saffman condition on the interface between the free flow and the porous media regions. Numerical examples are presented to illustrate the effectiveness of this method.