1023-76-1549 **Jie Shen*** (`shen@math.purdue.edu`), Department of Mathematics, Purdue University, West Lafayette, IN 47906. *Modeling and simulation of multiphase incompressible flows using an energetic variational phase field model.*

I shall introduce an energetic variational phase field model for the mixture of two incompressible fluids which leads to a set of coupled nonlinear system consisting a phase equation and the Navier-Stokes equations. I shall present an efficient and accurate numerical schemes for solving this coupled nonlinear system, and show ample numerical results which not only demonstrate the effectiveness of our numerical schemes, but also validate the flexibility and robustness of our phase-field model. (Received September 26, 2006)