

**Meeting:** 1003, Atlanta, Georgia, SS 27A, AMS-SIAM Special Session on Analysis and Applications in Nonlinear Partial Differential Equations, I

1003-65-1485      **Jian-Jun Xu\*** (jxu@pims.math.ca), Department of Mathematics, Simon Fraser University, Burnaby, BC V5A 1S6, Canada, **Zhilin Li**, Department of Mathematics, North Carolina State University, Raleigh, NC 27695, **John Lowengrub**, Department of Mathematics, University of California at Irvine, Irvine, CA 92697, and **Hongkai Zhao**, Department of Mathematics, University of California at Irvine, Irvine, CA 92697. *Level Set method for a Surfactant Problem.*

Surfactants are surface-active agents presented on an interface in a fluid flow. Surfactants play a critical role in numerous important industrial and biomedical applications. In the surfactant problem, the motion and the geometry of the moving interface, the dynamics of the fluid flow and the evolution of surfactant concentration all are coupled together.

In this talk, the level set formulation for surfactant problem for general multiphase incompressible Navier-Stokes flow is presented. The immersed interface method is used to capture the jumps of the physical quantities at the interface for a Stokes flow. A semi-implicit method is used to remove the stiffness of the surface Laplacian for the evolution of surfactant concentration. Numerical simulations for the Stokes flow are presented to illustrate the efficiency of the method. (Received October 05, 2004)