1005-76-65   **Yuriko Renardy*** (`renardyy@math.vt.edu`), Department of Mathematics, 460 McBryde Hall, Blacksburg, VA 24061-0123. *Development and implementation of VOF-PROST for 3D viscoelastic liquid-liquid simulations.*

This talk is on a volume-of-fluid algorithm with a parabolic re-construction of the interface for the calculation of the surface tension force (VOF-PROST). This achieves higher accuracy for drop deformation simulations in comparison with existing methods based on a piecewise linear interface re-construction. The Oldroyd-B constitutive law is used. The algorithm is applied to the evolution of a drop suspended in a second liquid and undergoing simple shear. Numerical results are compared with the small deformation theory for second-order liquids, and to experimental data of Guido et. al (J. Non-Newtonian Fluid Mech. 2003) for large deformation. (Received January 26, 2005)