

1059-76-169

Konstantin S. Turitsyn* (turitsyn@lanl.gov), T-4, Theoretical Division, Los Alamos National Laboratory, Los Alamos, NM 87545, and **Lipeng Lai** and **Wendy W. Zhang**. *Bubble break-up as a two-dimensional free surface hydrodynamics problem.*

Break-up of gas bubbles immersed in liquid is a natural event occurring in multiple multiphase systems. Associated to this event is a process of gas neck reconnection. Recent experiments performed in University of Chicago have shown that neck reconnection is a non-universal process with the outcome strongly dependent on the initial conditions. In this talk I will show how the neck reconnection dynamics can be described by a two-dimensional free surface hydrodynamic model. This model can be effectively solved numerically with conformal mapping techniques that were introduced in the works of S. Tanveer and V. Zakharov et.al. I will present the results of numerical simulations which show that the smooth contact of gas-liquid interface is a generic outcome of the dynamics, however the final shape of the neck is strongly dependent on the initial conditions. I will also discuss possible extensions of the model that include the effect of large scale fluid velocity structure and non-trivial topology of the interface. (Received February 22, 2010)