Abstract Submitted
for the DFD14 Meeting of
The American Physical Society

Numerical study of interface stability in presence of surfactant in two phase couette flow using a multiphase lattice boltzmann method V.P.T.N.C.SRIKANTH BOJJA, Norwegian Univ Tech (NTNU) — The multiphase lattice Boltzmann approach is used to study the dynamics of interface between two immiscible fluids of different densities and viscosities in presence of a insoluble surfactant in Coutte flow. The simulations are performed on muti-cpu cluster using MPI. The effects of inertia (Reynolds number) and surfactant (Marangoni number) on the stability of the interface at arbitary wave numbers are investigated. Neutral-stability and growth-rate curves are plotted at different wave-numbers, Reynolds numbers and Marangoni numbers. Interesting phenomenon of surfactant accumulation on the crest of interfacial waves is observed and subsequent breakdown of the interfacial wave, droplet formation,entrainment are also observed in 3D simulations.

V.P.T.N.C.Srikanth Bojja
Norwegian Univ Tech (NTNU)

Date submitted: 01 Aug 2014 Electronic form version 1.4