Abstract Submitted for the DFD07 Meeting of The American Physical Society

Rayleigh-Taylor Instability in a Sedimenting Suspension¹ PETER MUCHA, University of North Carolina, SWATHI GUDA — The evolution of the unstable interface between particles sedimenting under gravity above and clear fluid below is investigated computationally. Large numbers of model particles undergoing dilute hydrodynamic interactions between no-slip side walls are simulated under various physical and numerical parameters. Growth rates for different wave numbers characterizing the initial instabilities in the developing front are calculated and compared favorably with results for miscible fluids and with existing experimental and computational results in the literature. A model visualization technique is applied to the simulated data to further investigate the hydrodynamic mechanisms involved, both in the initial instability and in the evolution of particle-laden fingers. This talk includes joint work with Svetlana Bukharina, Florian Hecht, and Greg Turk.

¹Supported by the DOE (ECPI in Applied Mathematics) and NSF (MSPA-MCS)

Peter Mucha University of North Carolina

Date submitted: 03 Aug 2007

Electronic form version 1.4