Abstract Submitted
for the DFD12 Meeting of
The American Physical Society

Bouncing vs penetration of a particle through fluid interface ALEX KOTSCH, Department of Engineering Science and Mechanics, Virginia Tech, SUNGYON LEE, Department of Mathematics, UCLA, SUNGHWAN JUNG, Department of Engineering Science and Mechanics, Virginia Tech — Capturing small particles by air bubbles is fundamental to understanding numerous industrial processes of multiphase fluid. In the simple limit of a bubble-sphere interaction, we consider a solid sphere impinging onto a free surface inside the bath of fluid. Experimentally, we observe two main regimes of particle-interface interactions that depend on the initial particle kinetic energy: bouncing and penetration, with a clear transition point from one to the other. Specifically, we find two distinct scalings for change in Weber number versus initial Weber number for the two regimes. In this talk, we present the novel experimental findings and theoretical justifications.

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Date submitted: 09 Aug 2012 Electronic form version 1.4