Abstract Submitted
for the DFD16 Meeting of
The American Physical Society

Bubble Impact with a Solid Wall VISHRUT GARG, SUMEET THETE, OSMAN BASARAN, Purdue University — In diverse natural and industrial processes, and in particular in process equipment widely used in oil and gas production, bubbles and drops that are immersed in a continuous liquid phase frequently collide with solid walls. In this talk, the impact with a solid wall of a gas bubble that is surrounded by a liquid that is either a Newtonian or a non-Newtonian fluid is analyzed by numerical simulation. Special attention is paid to the thin film that forms between the approaching bubble and the solid wall. Flow regimes that arise as the film thickness decreases are scrutinized and rationalized by comparison of the computational predictions to well-known and new analytical results from lubrication theory based thin film literature. Finally, flow transitions that occur as the lubrication theory breaks down and inertia becomes significant are investigated.

Osman Basaran
Purdue University

Date submitted: 30 Jul 2016 Electronic form version 1.4