Abstract Submitted
for the DFD10 Meeting of
The American Physical Society

**Stokes' Cradle: Oblique Collisions between Wetted Particles** CARLY DONAHUE, CHRISTINE HRENYA, ROBERT DAVIS, WILLIAM BREWER, University of Colorado — Granular particles can be made more cohesive by applying a viscous liquid to the surface of the particle. Such wetted particles are naturally involved in pollen capture and avalanches and can be found in industrial processes such as granulation and filtration. The focus here is on collisions between wetted particles in which lubrication forces dominate over capillary forces (i.e., high capillary number). Previous experiments with such systems have been limited to normal (head-on) collisions of spheres and collisions between a sphere and an immobile wall. In these cases, rebound (de-agglomeration) was found to depend upon the surface roughness of the solids, the elastohydrodynamic interaction, or the pressure-dependent viscosity. In this effort, we experimentally investigate collisions between two wetted particles impacting at an oblique angle. Now, in addition to the above interactions, the presence of a centrifugal force also contributes to the mechanism for rebounded-agglomeration. A theoretical analysis of the associated regime maps provides useful insight to unravel the relevant physical processes that occur in oblique collisions.

Carly Donahue
University of Colorado

Date submitted: 06 Aug 2010 Electronic form version 1.4