

Abstract Submitted
for the DFD07 Meeting of
The American Physical Society

The rebound of small particles impacting a free surface

MATTHEW HANCOCK, JEFFREY ARISTOFF, JOHN BUSH, Dept. of Mathematics, MIT — The impact of small particles on a free surface is a problem of fundamental interest with various applications including biolocomotion, pollination and contaminant transport. We present the results of a combined theoretical and experimental investigation of the normal impact of spherical particles on an air-water surface, and give particular focus to deducing criteria for particle rebound. Computing particle trajectories requires consideration of the particle's inertia and weight, in addition to the forces resisting its motion, specifically, buoyancy, hydrodynamic drag forces and contact or curvature forces associated with the surface tension. Simplified models for these forces yield criteria for particle rebound that are tested against experimental observations.

Matthew Hancock
MIT

Date submitted: 03 Aug 2007

Electronic form version 1.4