Measurement of Stopping Force in Low Velocity Impact Cratering

JOSEPH AMATO, MICHAEL NITZBERG, Colgate University — The time dependent stopping force on a ball dropped into a granular medium has been measured using an accelerometer embedded within the ball. The velocity dependence of the force shows two distinct behaviors: (1) for impacts with large (200 µm) irregularly shaped sand particles, \( F(v) \propto v^{1/2} \); for impacts with 100 µm spherical glass beads, \( F(v) \propto (v - v_0) \). The accelerator apparatus yields reproducible, low noise data that reveals peculiar features such as a downward acceleration pulse just before the ball comes to rest.