Abstract Submitted
for the DFD08 Meeting of
The American Physical Society

Measurement of Forces on a Solid Sphere During Impact with a Free Liquid Surface REUVEN S. BALLABAN, MICHAEL F. SCHATZ, Center for Nonlinear Science and School of Physics, Georgia Institute of Technology, DANIEL I. GOLDMAN, MATEO GARCIA, School of Physics, Georgia Institute of Technology — When a solid impacts a free liquid surface, air jets form around the point of impact. To measure the impact forces associated with this effect, a solid steel sphere, instrumented with an accelerometer, was dropped from various heights (10-40cm) corresponding to different impact velocities (140-280 cm/s). To control the behavior of the air jets, the ambient air pressure above the liquid surface was varied between 0.1-1.0 atmospheres. High speed video images of impact are compared to acceleration profile measurements, thereby permitting quantitative connection of the air jet dynamics to the forces exerted on the sphere during impact.

Reuven S. Ballaban
Center for Nonlinear Science and School of Physics,
Georgia Institute of Technology

Date submitted: 01 Aug 2008 Electronic form version 1.4