Abstract Submitted
for the SHOCK15 Meeting of
The American Physical Society

Material properties for asteroid deflection[1] M. BRUCK SYAL, J. BERNIER, Lawrence Livermore National Laboratory, L. CHEN, Imperial College London, F. COPPARI, D. DEARBORN, E. HERBOLD, K. HOWLEY, R. KRAUS, M. KUMAR, M. MILLOT, J. M. OWEN, D. SWIFT, J. WASEM, R. MULFORD, Lawrence Livermore National Laboratory, S. ROOT, Sandia National Laboratories, D. COTTO-FIGUEROA, E. ASPHAUG, Arizona State University, P. SCHULTZ, Brown University, J. NUTH, NASA's Goddard Space Flight Center, J. ARNOLD, C. BURKHARD, J. DOTSON, T. LEE, D. SEARS, NASA Ames Research Center, P. MILLER, Lawrence Livermore National Laboratory — Impulsive strategies to prevent asteroid impacts depend upon knowledge of asteroidal material state and response at extreme conditions. Numerical modeling of kinetic impactor and nuclear ablation scenarios to deflect or disrupt asteroids reveals sensitivities to equation of state, strength, and porosity. We report advances in material models for asteroid mitigation simulations. Equation of state development focuses on asteroidal materials, such as hydrated silicates. Shock experiments are being performed to measure properties of meteoritic material; initial sample temperature can be controlled from 100-1000 K, important for different intercept scenarios. New constitutive models allow improved thermomechanical response predictions for porous asteroids.

[1]This work was performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344.

M. Bruck Syal
Lawrence Livermore National Laboratory

Date submitted: 30 Jan 2015 Electronic form version 1.4