Abstract Submitted
for the DPP07 Meeting of
The American Physical Society

Improved EOS for Describing Off-Hugoniot States in Epoxy/Foam IC Targets ROBERTA MULFORD, NICHOLAS LANIER, Los Alamos National Laboratory, DAMIAN SWIFT, Lawrence Livermore National Laboratory, SHANE WALTON, IAN TREGILLIS, JONATHAN WORKMAN, Los Alamos National Laboratory, PETER GRAHAM, ALASTAIR MOORE, Atomic Weapons Establishment, UK — Hydrodynamic experiments typically rely on pre-shot target characterization to predict how initial perturbations in the material interfaces will affect the late-time hydrodynamic mixing. The condition, particularly temperature, of these perturbations at the time of shock arrival dominates their eventual late-time evolution. Modeling of off-Hugoniot states in an expanding interface subjected to a shock reveals the importance of using a chemically complete description of the materials. In the experiment modeled, an epoxy/foam layered package was subjected to tin L-shell radiation, producing an expanding assembly at a well-defined temperature. The evolution of the shocked epoxy-foam interface was imaged with x-ray radiography. Modeling of the data with the hydrodynamics code RAGE required condensation of the plasma to be explicitly included. EOS were prepared that included formation of polyatomic species in the states present before shock arrival. These EOS improved fidelity of the modeling to measured details of interface behavior.

Roberta Mulford
Los Alamos National Laboratory

Date submitted: 24 Jul 2007 Electronic form version 1.4