Abstract Submitted
for the DPP10 Meeting of
The American Physical Society

Investigation of radiative-shock structure in x-ray-driven shock-tube simulations[1] ERIC MYRA, University of Michigan — The Center for Radiative Shock Hydrodynamics (CRASH) seeks to improve the predictive capability of models for shock waves produced in xenon when a laser is used to shock, ionize, and accelerate a beryllium plate into a xenon-filled shock tube. These shocks, when driven above a threshold velocity of about 100 km/s, become strongly radiative and convert most of the incoming energy flux into radiation. Among the interesting features observed in CRASH experiments is the formation of wall shocks, which result from ablation of the polyimide walls of the shock tube. This ablation is due to heating caused by a radiative precursor that propagates ahead of the primary shock. We show here the results of simulations studying the formation and evolution of radiative shocks and associated features. We find that wall ablation plays an important role in shaping the evolution of wall shocks and, as a consequence, directly influences the evolution of the primary shock and the system as a whole.

[1]Research funded by the DOE NNSA/ASC under Predictive Science Academic Alliance Program grant number DEFC52-08NA28616.

Eric Myra
University of Michigan

Date submitted: 15 Jul 2010 Electronic form version 1.4