Abstract Submitted
for the DPP08 Meeting of
The American Physical Society

Comparison of one- and two-dimensional simulations of laser driven shock experiments using 1D and 2D HYADES[1] J. EDUARDO MUCINO, R. PAUL DRAKE, DAN AUSTIN, MIKE J. GROSSKOPF, University of Michigan — Computer simulations play an important role in target design, experimental planning, and diagnostic selection for experiments in high-energy-density physics, such as those performed at the OMEGA laser facility in Rochester, NY, which involve shocks driven by high intensity lasers. These experiments can be modeled using one-dimensional and two-dimensional versions of a Lagrangian radiation-hydrodynamic code, HYADES. The one-dimensional simulations are effective for scaling calculations but cannot account for the lateral flow of mass and/or energy that are present in two dimensions. This study seeks to quantify the extent to which lateral flow of mass and energy affects the evolution of the simulated flow by identifying differences between the one- and two-dimensional pressure, density, and electron temperature profiles. We are assessing these effects both in thin targets that experience post-shock ablative acceleration and thick targets that are not accelerated, for a range of laser intensities.

[1]This research was sponsored by the NNSA Stewardship Sciences Academic Alliances through DOE Research Grants DE-FG52-07NA28058, and by other grants and contracts.

J. Eduardo Mucino
University of Michigan

Date submitted: 17 Jul 2008 Electronic form version 1.4