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Modeling Laboratory Astrophysics Experiments in the High-Energy-Density Regime Using the CRASH Radiation-Hydrodynamics Model M.J. GROSSKOPF, R.P. DRAKE, M.R. TRANTHAM, C.C. KURANZ, P.A. KEITER, University of Michigan, Ann Arbor, E.M. RUTTER, Arizona State University, R.M. SWEENEY, Columbia University, G. MALAMUD, University of Michigan, Ann Arbor and Department of Physics, Nuclear Research Center, Negev, Israel — The radiation hydrodynamics code developed by the Center for Radiative Shock Hydrodynamics (CRASH) at the University of Michigan has been used to model experimental designs for high-energy-density physics campaigns on OMEGA and other high-energy laser facilities. This code is an Eulerian, block-adaptive AMR hydrodynamics code with implicit multigroup radiation transport and electron heat conduction. CRASH model results have shown good agreement with a experimental results from a variety of applications, including: radiative shock, Kelvin-Helmholtz and Rayleigh-Taylor experiments on the OMEGA laser; as well as laser-driven ablative plumes in experiments by the Astrophysical Collisionless Shocks Experiments with Lasers (ACSEL), collaboration. We report a series of results with the CRASH code in support of design work for upcoming high-energy-density physics experiments, as well as comparison between existing experimental data and simulation results. This work is funded by the Predictive Sciences Academic Alliances Program in NNSA-ASC via grant DEFC52- 08NA28616, by the NNSA-DS and SC-OFES Joint Program in High-Energy-Density Laboratory Plasmas, grant number DE-FG52-09NA29548, and by the National Laser User Facility Program, grant number DE-NA0000850.

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