

Abstract Submitted
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Collaborative comparison of high-energy-density physics codes (LA-UR-12-22121)¹ BRUCE FRYXELL, University of Michigan, MILAD FATENEJAD, University of Chicago, JOHN WOHLBIER, Los Alamos National Laboratory, ERIC MYRA, University of Michigan, DON LAMB, University of Chicago, CHRIS FRYER, Los Alamos National Laboratory, CARLOS GRAZIANI, University of Chicago, ZACH MEDIN, RICK RAUENZAHN, Los Alamos National Laboratory — Radiation-hydrodynamic simulations are vital to understanding high-energy-density physics (HEDP) experiments. We are in the process of comparing three HEDP codes, including CRASH (U. of Michigan), FLASH (U. of Chicago), and xRAGE (LANL) on a wide variety of problems, ranging from simple tests to full HEDP experiments. The goals are to understand the differences between the codes and how they influence the results, to determine which codes contain the most accurate algorithms and physics models, and where possible, to improve the other codes to produce more faithful representations of HEDP experiments. The calculations discussed here include simple temperature relaxation problems in an infinite, uniform medium, tests of the diffusion solvers (both conduction and radiation), and tests that add hydrodynamic effects. The eventual goal is to compare the results from all of the codes on simulations of radiative shock experiments being performed by The Center for Radiative Shock Hydrodynamics (CRASH) at the University of Michigan and to understand any discrepancies between the results of the simulations and the experiments.

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