

Abstract Submitted
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Making FLASH an Open Code for the Academic High-Energy Density Physics Community¹ D.Q. LAMB, S.M. COUCH, A. DUBEY, S. GOPAL, C. GRAZIANI, D. LEE, K. WEIDE, G. XIA, DOE NNSA ASC Flash Center, U. Chicago — High-energy density physics (HEDP) is an active and growing field of research. DOE has recently decided to make FLASH a code for the academic HEDP community. FLASH is a modular and extensible compressible spatially adaptive hydrodynamics code that incorporates capabilities for a broad range of physical processes, performs well on a wide range of existing advanced computer architectures, and has a broad user base. A rigorous software maintenance process allows the code to operate simultaneously in production and development modes. We summarize the work we are doing to add HEDP capabilities to FLASH. We are adding (1) Spitzer conductivity, (2) super time-stepping to handle the disparity between diffusion and advection time scales, and (3) a description of electrons, ions, and radiation (in the diffusion approximation) by 3 temperatures (3T) to both the hydrodynamics and the MHD solvers. We are also adding (4) ray tracing, (5) laser energy deposition, and (6) a multi-species equation of state incorporating ionization to the hydrodynamics solver; and (7) Hall MHD, and (8) the Biermann battery term to the MHD solver.

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