Abstract Submitted
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Additions and improvements to the high energy density physics capabilities in the FLASH code[1] D. LAMB, A. BOGALE, S. FEISTER, N. FLOCKE, C. GRAZIANI, B. KHIAR, J. LAUNE, P. TZEFERACOS, C. WALKER, K. WEIDE, Flash Center for Computational Physics, University of Chicago — FLASH is an open-source, finite-volume Eulerian, spatially-adaptive radiation magnetohydrodynamics code that has the capabilities to treat a broad range of physical processes. FLASH performs well on a wide range of computer architectures, and has a broad user base. Extensive high energy density physics (HEDP) capabilities exist in FLASH, which make it a powerful open toolset for the academic HEDP community. We summarize these capabilities, emphasizing recent additions and improvements. We describe several non-ideal MHD capabilities that are being added to FLASH, including the Hall and Nernst effects, implicit resistivity, and a circuit model, which will allow modeling of Z-pinch experiments. We showcase the ability of FLASH to simulate Thomson scattering polarimetry, which measures Faraday due to the presence of magnetic fields, as well as proton radiography, proton self-emission, and Thomson scattering diagnostics. Finally, we describe several collaborations with the academic HEDP community in which FLASH simulations were used to design and interpret HEDP experiments.

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Don Lamb
University of Chicago

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