Abstract Submitted
for the DPP17 Meeting of
The American Physical Society

Modeling experimental plasma diagnostics in the FLASH code: proton radiography[1] NORBERT FLOCKE, KLAUS WEIDE, SCOTT FEISTER, PETROS TZEFERACOS, DONALD LAMB, Univ of Chicago — Proton radiography is an important diagnostic tool for laser plasma experiments and for studying magnetized plasmas. We describe a new synthetic proton radiography diagnostic recently implemented into the FLASH code. FLASH is an open source, finite-volume Eulerian, spatially adaptive radiation hydrodynamics and magneto-hydrodynamics code that incorporates capabilities for a broad range of physical processes. Proton radiography is modeled through the use of the (relativistic) Lorentz force equation governing the motion of protons through 3D domains. Both instantaneous (one time step) and time-resolved (over many time steps) proton radiography can be simulated. The code module is also equipped with several different setup options (beam structure and detector screen placements) to reproduce a large variety of experimental proton radiography designs. FLASHs proton radiography diagnostic unit can be used either during runtime or in post-processing of simulation results. FLASH is publicly available at flash.uchicago.edu.

[1]U.S. DOE NNSA, U.S. DOE NNSA ASC, U.S. DOE Office of Science and NSF

Norbert Flocke
Univ of Chicago

Date submitted: 13 Jul 2017 Electronic form version 1.4