Adding Capabilities to FLASH to Create Open Toolset for High-Energy Density Physics Simulations

Anshu Dubey[1], Don Lamb[1], Klaus Weide[1], Dongwook Lee[1], Guohua Xia[1], Carlo Graziani[1], Chris Daley[1], George Jordan[1], Daan van Rossum[1]

[1]*ASC/Flash Center, 5640 S. Ellis Ave, Chicago, IL 60637, dubey@flash.uchicago.edu, lamb@oddjob.uchicago.edu, klaus@flash.uchicago.edu, dongwook@flash.uchicago.edu, gxia@uchicago.edu, carlo@oddjob.uchicago.edu, cdaley@flash.uchicago.edu, gjordan@flash.uchicago.edu, daan@flash.uchicago.edu*

FLASH is a highly capable, fully modular, professionally managed code with a wide user base. FLASH consists of inter-operable modules that can be combined to generate different applications such as novae, supernovae, X-Ray bursts, galaxy clusters, weakly compressible turbulence and many other problems in astrophysics and other fields. With its flexibility and extensibility, FLASH provides an excellent foundation for an open software base for the academic HEDP community. Working together with scientists at Lawrence Livermore National Laboratory, the FLASH team has identified a set of capabilities needed in the code to make it a highly capable open toolset for simulating long-pulse laser direct drive experiments. Some of these capabilities include Spitzer heat conductivity, multi-temperatures treatment in hydrodynamics, ray tracing and laser energy deposition, Hall MHD, and a Biermann battery term. In this presentation we outline our overall strategic plan for developing these capabilities, and report on the progress made in the implementation of the new components.

8th International Conference on High Energy Density Laboratory Astrophysics
March 15-18, 2010
California Institute of Technology
Pasadena, California, USA
http://hedla2010.caltech.edu/