Abstract Submitted
for the DPP07 Meeting of
The American Physical Society

Development and benchmarking of radiation transport models in LSP. IGOR GOLOVKIN, JOSEPH MACFARLANE, PAMELA WOODRUFF, Prism Computational Sciences, PETER HAKEL, ROBERTO MANCINI, University of Nevada Reno, THOMAS HUGHES, DALE WELCH, CARSTEN THOMA, BOB CLARK, CHRIS MOSTROM, Voss Scientific, LLC, F. DOUGLAS WITHERSPOON, MIKE PHILLIPS , HyperV Technologies Corp., N.I. BOGATU, JIN-SOO KIM, SERGEI GALKIN, FAR-TECH, Inc — LSP is a hybrid particle-in-cell (PIC) code widely used to model various plasmas. We report on the recently added improvements to the modeling of radiation and atomic physics within LSP. Multi-group radiation diffusion in 2D Cartesian and cylindrical geometries has been implemented and tested. Also, the ability to utilize detailed opacity and equation-of state tables has been added. We will provide details of the implementation, as well the results of various benchmarks against analytic solutions to the radiation transport problems in multi-dimensions and against one-dimensional hydrodynamics simulations. This work is supported by the U.S. Department of Energy Office of Fusion Energy Sciences.

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Date submitted: 19 Jul 2007 Electronic form version 1.4