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Radiation transport in PIC modeling of laser interaction with high-Z targets[1] IOANA PARASCHIV, YASUHIKO SENTOKU, University of Nevada Reno — Laser-target interactions generate hot, dense, radiating plasmas and for high-Z target materials radiation effects are very important, becoming one of the dominating energy-exchange mechanisms. In order to take into account the cooling and heating effects due to the radiation field in a laser-produced plasma we are developing a radiation transport model coupled with a particle-in-cell code, PICLS. We have implemented a short-characteristics numerical scheme in order to solve the 1D steady-state radiation transport equation. In solving the equation of radiation transport it was assumed that opacities and emissivities were known in all the grid points. A database of emissivities and opacities as functions of photon frequency has been created for given densities and temperatures, using results computed by the 0-D code FLYCHK together with its postprocessor FLYSPECTRA [1]. FLYCHK calculates the ionization and population distributions for a plasma of given electron temperature and density using simplified population kinetics models. The results obtained from the implementation of the radiation transport model into the PICLS calculations will be reported in this presentation.

[1] H.-K. Chung, M.H. Chen, W.L. Morgan, Y. Ralchenko, HEDP 1, 3 (2005)

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Ioana Paraschiv
University of Nevada Reno

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