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Radiation transport in ultrafast heated high Z solid targets[1]
IOANA PARASCHIV, YASUHIKO SENTOKU, ROBERTO MANCINI, University of Nevada Reno, TOMOYUKI JOHZAKI, Hiroshima University — Ultra-intense laser-target interactions generate hot, dense, and radiating plasmas, especially in the case of high-Z target materials. In order to evaluate the effect of radiation and its transport on the laser-produced plasmas we have developed a radiation transport (RT) code and implemented it in a collisional particle-in-cell code, PICLS. The code uses a database of emissivities and opacities as functions of photon frequency, created for given densities and temperatures by the non-equilibrium, collisional-radiative atomic kinetics 0-D code FLYCHK together with its postprocessor FLYSPECTRA [1]. Using the two-dimensional RT-PICLS code we have studied the X-ray transport in an ultrafast heated copper target, the X-ray conversion efficiency, and the exchange of energy between the radiation field and the target. The details of these 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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