

Abstract Submitted
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Inclusion of radiation transport and EOS ionization tables in Hybrid-PIC simulations of plasma jets¹ PETER HAKEL, UNR, BOB CLARK, TOM HUGHES, CHRIS MOSTROM, Voss, IGOR GOLOVKIN, PAMELA WOODRUFF, JOSEPH J. MACFARLANE, Prism — We report on the progress in plasma simulations using the hybrid particle-in-cell (PIC) code LSP. Recently added modeling capabilities include the effects of ionization and radiation. Transport of radiation is treated in two dimensions using the multigroup diffusion approximation. In addition to free-free opacities, we account for the atomic bound states (i.e., line and bound-free radiation) and plasma self-emission and absorption in modeling of the plasma optical properties. The energy in the radiation field is coupled to the plasma through the absorption and emission terms in the plasma energy equation. We use the PROPACEOS equation-of-state (EOS) tables that take into account ionization and other non-ideal effects for the given chemical composition. Gray and multigroup radiation fluxes escaping the plasma are extracted and visualized for diagnostic and engineering purposes. We applied the recently enhanced LSP code to modeling of the plasma jet accelerator experiments at HyperV.

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