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Ion Kinetic Effects in Hybrid-PIC Simulations of Merging Plasma Jets[1] CARSTEN THOMA, NICHELLE BRUNER, ROBERT CLARK, DALE WELCH, Voss Scientific, LLC, JOSEPH MACFARLANE, IGOR GOLOVKIN, Prism Computational Sciences, Inc. — Merging plasma jets will be used to form imploding plasma liners for generating HED plasma and as a standoff driver for magneto- inertial fusion. In the upcoming Plasma Liner Experiment (PLX) at Los Alamos National Laboratory a spherical array of 30 plasma jets generated by compact accelerators will be merged. We present simulation results of plasma jets in the PLX parameter regime ($n_i \sim 10^{17}$ cm^{-3}, T_e, $T_i \sim 1$ eV) using the Hybrid particle-in-cell (PIC) code LSP. Electron macroparticles are treated as Lagrangian fluid elements while ion macroparticles may be treated either as a fluid or a kinetic species. The kinetic approach for ions captures non-maxwellian behavior and finite mean-free-path effects such as inter- penetration in jet merging. We present results for acceleration, transport, and merging of argon plasma jets, and compare the results for simulations with fluid and kinetic ions.

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