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Numerical Modeling of Plasma-Liner Formation and Implosion for the PLX-α Project.[1] JASON CASSIBRY, Univ of Alabama - Huntsville, ROMAN SAMULYAK, Brookhaven National Laboratory, KEVIN SCHILLO, Univ of Alabama - Huntsville, WEN SHIH, Stony Brook University, SCOTT HSU, Los Alamos National Laboratory — Numerical simulations of the propagation, merging, and implosion of supersonic plasma jets have been performed using the FronTier and smooth particle hydrodynamics (SPH) codes in support of the PLX-α project. The physics includes radiation, heat conduction using Braginskii thermal conductivities, ion viscosity, and tabular equations of state using LTE and non-LTE models. A parametric analysis provides scaling of peak ram pressure and Mach number vs. number of jets, initial density, initial jet velocity, and species including nitrogen, neon, argon, krypton, and xenon. Conical simulations of 6 and 7 jets support near-term experiments, which facilitate diagnostic access for assessing the quality of the liner during merge. Solid angle averaged and standard deviation of ram pressure and Mach number reveal the variation in these properties during formation and implosion. Spherical harmonic mode-number analysis of spherical slices of ram pressure at various radii and times provide a quantitative means to assess the evolution of liner non-uniformity.

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