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Modeling of the merging, liner formation, implosion of hypervelocity plasma jets for the PLX-α project JASON CASSIBRY, Univ of Alabama - Huntsville, SCOTT HSU, Los Alamos National Laboratory, KEVIN SCHILLO, Univ of Alabama - Huntsville, ROMAN SAMULYAK, Brookhaven National Laboratory, PETER STOLTZ, KRIS BECKWITH, Tech-X Corporation — A suite of numerical tools will support the conical and 4π plasma-liner-formation experiments for the PLX-α project. A new Lagrangian particles (LP) method will provide detailed studies of the merging of plasma jets and plasma-liner formation/convergence. A 3d smooth particle hydrodynamic (SPH) code will simulate conical (up to 9 jets) and 4π spherical (up to 60 jets) liner formation and implosion. Both LP and SPH will use the same tabular EOS generated by Propaceos, thermal conductivity, optically thin radiation and physical viscosity models. With LP and SPH,the major objectives are to study Mach-number degradation during jet merging, provide RMS amplitude and wave number of the liner nonuniformity at the leading edge, and develop scaling laws for ram pressure and liner uniformity as a function of jet parameters. USIM, a 3D multi-fluid plasma code, will be used to perform 1D and 2D simulations of plasma-jet-driven magneto-inertial fusion (PJMIF) to identify initial conditions in which the "liner gain" exceeds unity. A brief overview of the modeling program will be provided. Results from SPH modeling to support the PLX- α experimental design will also be presented, including preliminary ram-pressure scaling and non-uniformity characterization.

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