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High Speed Jet Merging Studies In Support of PLX[1] ANDREW CASE, RICHARD BOMGARDNER, SARAH MESSER, SAM BROCKINGTON, LIN-CHUN WU, RAY ELTON, F. DOUGLAS WITHERSPOON, Hyperv Technologies — Formation of an imploding plasma liner for the Plasma Liner Experiment (PLX) requires individual plasma jets to merge into a uniform shell of plasma converging on the target region. In order to understand the dynamics of the merging process, knowledge of the plasma phenomena involved is required. We present here results from a study of the merging of two and three plasma jets in two dimensional (coplanar) and three dimensional geometry. The experiments were performed using HyperV Technologies Corp. one centimeter bore MiniRailguns on a vacuum chamber designed to partially reproduce the port geometry of the PLX vacuum chamber. Diagnostics include fast imaging, spectroscopy, interferometry, deflectometry, fast pressure probes, B-dot probes, and high speed spatially resolved photodiodes, permitting measurements of plasma density, temperature, velocity, stagnation pressure, trapped magnetic field, and density gradients. These experimental results are compared with simulation results from the LSP 3D hybrid PIC code.

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