

Abstract Submitted
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Experimental characterization of plasma-liner formation via merging supersonic plasma jets¹ SAMUEL LANGENDORF, SCOTT HSU, JOHN DUNN, Los Alamos National Laboratory, KEVIN YATES, MARK GILMORE, University of New Mexico, PLX-ALPHA TEAM — The Plasma Liner Experiment-ALPHA (PLX- α) is investigating the merging of supersonic plasma jets into a spherically imploding plasma liner as a compression driver for magneto-inertial fusion (MIF). Concurrently, we are also studying the fundamental physics of plasma shocks, from collisional to collisionless regimes, using the same platform. The present work is focused on characterizing the merging of six and/or seven plasma jets, converging in a cone of solid angle 0.4π over a distance of 1.3 meters, as well as studies with fewer jets to isolate and vary shock properties. Data will be presented on plasma jet/liner velocities, electron/ion densities and temperatures, and mean ionization state. Diagnostics include a multi-chord interferometer, visible survey and high-resolution spectrometers, fast-framing camera, and photodiode arrays. Spectroscopy and interferometry data are compared with synthetic data from 3D front-tracking and smooth-particle-hydrodynamic simulations. Results will provide new understanding of plasma shock structure/dynamics and assessment of plasma liners as an MIF driver.

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