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Characterizing an octant of a spherically imploding plasma liner as an MIF driver[1] S. C. HSU, S. J. LANGENDORF, J. P. DUNN, LANL, K. C. YATES, M. GILMORE, UNM, F. D. WITHERSPOON, S. BROCKINGTON, A. CASE, E. CRUZ, HyperV Technologies, Y. C. F. THIO, HyperJet Fusion, AND THE PLX-α TEAM — Spherically imploding plasma liners formed by merging supersonic plasma jets are a proposed compression driver for magneto-inertial fusion (MIF). The Plasma Liner Experiment-ALPHA (PLX-α) aims to demonstrate the formation of sub-fusion-scale plasma liners ($\sim$ 150-kJ kinetic energy) via dozens of merging supersonic plasma jets (with initial ion density $\sim 10^{16}$ cm^{-3}, velocity $\approx$ 50 km/s, mass $\sim$ 1 mg, and use of various gas species). In this talk, we summarize experimental findings on the formation of an octant of spherically imploding plasma liners by merging up to six plasma jets. Experimental data from gated fast-framing-cameras, survey and high-resolution visible spectrometers, and a multichord interferometer have been analyzed to assess (i) ion heating (and associated liner-Mach-number degradation) due to collisional shock formation between merging jets, and (ii) liner uniformity upon jet merging. These data are being used to benchmark code calculations, which will set requirements on the allowable shock heating and nonuniformity for scaled-up plasma liners to be an effective MIF compression driver. We also describe plans to field a 4π imploding plasma liner experiment.

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