

Abstract Submitted
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Contoured-gap coaxial guns for imploding plasma liner experiments¹ F.D. WITHERSPOON, A. CASE, S. BROCKINGTON, HyperV Technologies Corp., J.T. CASSIBRY, UAH, S.C. HSU, LANL — Arrays of supersonic, high momentum flux plasma jets can be used as standoff compression drivers for generating spherically imploding plasma liners for driving magneto-inertial fusion, hence the name plasma-jet-driven MIF (PJMIF). HyperV developed linear plasma jets for the Plasma Liner Experiment (PLX) at LANL where two guns were successfully tested. Further development at HyperV resulted in achieving the PLX goal of 8000 μg at 50 km/s. Prior work on contoured-gap coaxial guns demonstrated an approach to control the blowby instability and achieved substantial performance improvements. For future plasma liner experiments we propose to use contoured-gap coaxial guns with small Minirailgun injectors. We will describe such a gun for a 60-gun plasma liner experiment. Discussion topics will include impurity control, plasma jet symmetry and topology (esp. related to uniformity and compactness), velocity capability, and techniques planned for achieving gun efficiency of >50% using tailored impedance matched pulse forming networks. Mach2 and UAH SPH code simulations will be included.

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