

Abstract Submitted  
for the DPP19 Meeting of  
The American Physical Society

**HJ1 Coaxial Plasma Gun Development for PJMIF**<sup>1</sup> E. CRUZ, A. CASE, M. LUNA, R. BECKER, A. COOK, S. BROCKINGTON, F.D. WITHERSPOON, HyperJet Fusion Corporation & HyperV Technologies Corp., LANL PLX- $\alpha$  TEAM — We describe the engineering and technical improvements, as well as provide a detailed overview of the design choices, of HyperJet Fusion’s latest coaxial plasma gun, called HJ1, designed for the  $4\pi$  scaling study of spherically imploding plasma liners as a standoff driver for plasma-jet-driven magneto-inertial fusion. Each gun incorporates a compact 7.5kJ capacitor module with integral transmission line and sparkgap switching, an ultra-fast precision gas dispensing valve and a gas pre-ionization system utilizing a self-switching glow discharge. The evolution of the latest HJ1 coaxial plasma gun is presented with emphasis on its upgraded performance and improved packaging. Capacitor module changes include a new geometry with reduced overall footprint and improved access to components requiring maintenance, reduced transmission line gaps and rotating flanges for mounting. Additional improvements have been made to the gas valve design such that drive coil coupling efficiency has been improved by  $\sim 70\%$ . These changes result in a more robust gun, with improved workability for installation, use, and maintenance. [1] Hsu et al., IEEE Trans. Plasma Sci. 40 (2012). [2] Y.C.F. Thio et al., Fus. Sci. Tech., accepted (2019).

<sup>1</sup>This work supported by the ARPA-E ALPHA Program under contract DE-AR0000566 and Strong Atomics, LLC.

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Date submitted: 03 Jul 2019

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