

Abstract Submitted
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Diagnostics for the PLX PJMIF magnetized target plasma jets¹

ANDREW CASE, F. D. WITHERSPOON, EDWARD CRUZ, MARCO LUNA, ROBERT BECKER, ADAM COOK, HyperJet Fusion Corporation, LANL PLX TEAM TEAM — Our new SEED program is aimed at developing a suitable target plasma for Plasma Jet Magneto-Inertial Fusion (PJMIF) experiments at LANL [1,2]. The target parameters are density of $\sim 3 \times 10^{14} \text{ cm}^{-3}$, temperature above 5 eV, velocity of 100 km/s, and embedded magnetic field of 1 kG. In order to verify that the plasmoid meets these parameters we need to measure electron temperature (T_e), density (n), and magnetic field (B). The diagnostics used to verify that the plasmoid meets these criteria are interferometry (line integrated density), movable B-dot probe array (spatially resolved magnetic field), movable triple probe array (spatially resolved electron temperature, density), spatially resolved photodiodes (velocity) and time integrated spectroscopy (temperature, impurities). The fact that the plasma is supersonic poses certain challenges which are discussed along with the means used to address these issues. [1] Hsu et al., IEEE Trans. Plasma Sci. **40**, 1287 (2012). [2] Yates et al., Phys. Plasmas **27**, 062706 (2020).

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