

Abstract Submitted
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Diagnostics and results from coaxial plasma gun development for the PLX- α project*¹ A. CASE, S. BROCKINGTON, E. CRUZ, F. D. WITHERSPOON, HyperV Technologies — We present results from the diagnostics used during development of the contoured gap coaxial plasma guns [1] for the PLX- α project at LANL. Plasma-jet diagnostics include fast photodiodes for velocimetry, a ballistic pendulum for total plasmoid momentum, and interferometry for line integrated density. Deflectometry will be used for line integrated perpendicular density gradients. Time-resolved high-resolution spectroscopy using a novel detector and time-integrated survey spectroscopy are used for measurements of velocity and temperature, as well as impurities. We will also use a Faraday cup for density, fast imaging for plume geometry, and time-integrated imaging for overall light emission. Experimental results are compared to the desired target parameters for the plasma jets (up to $n \approx 2 \times 10^{16} \text{ cm}^{-3}$, $v \approx 50 \text{ km/s}$, mass $\approx 5 \text{ gm}$, radius = 4 cm, and length $\approx 10 \text{ cm}$).

[1] Witherspoon et al., Rev. Sci. Instr. **80**, 083506 (2009).

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