

Abstract Submitted
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Diagnostic Suite for HyperV Coaxial Plasma Gun Development for the PLX- α Project¹ ANDREW CASE, SAM BROCKINGTON, F. DOUGLAS WITHERSPOON, HyperV Technologies Corp. — We present the diagnostic suite to be used during development of the coaxial guns HyperV will deliver to LANL in support of the ARPA-E Accelerating Low-Cost Plasma Heating And Assembly (ALPHA) program. For plasma jet diagnostics this includes fast photodiodes for velocimetry, a ballistic pendulum for measuring total plasmoid momentum, interferometry for line integrated plasma density, deflectometry for line integrated perpendicular density gradient measurements, and spectroscopy, both time resolved high resolution spectroscopy using a novel detector developed by HyperV and time integrated survey spectroscopy, for measurements of velocity and temperature as well as impurities. In addition, we plan to use fast pressure probes for stagnation pressure, a Faraday cup for density, fast imaging for plume geometry and time integrated imaging for overall light emission. A novel low resolution long record length camera developed by HyperV will also be used for plume diagnostics. For diagnostics of gun operation, we will use Rogowski coils to measure current, voltage dividers for voltages, B-dot probes for magnetic field, and time resolved fast photodiodes to measure plasmoid velocity inside the accelerator.

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