

Abstract Submitted  
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**Measurements and Simulations of Bow Shocks in Laboratory Plasma Jets**<sup>1</sup> R. H. DWYER, N. HINES, SHAKIBA SADEGHI, M. GILMORE, University of New Mexico — Recent Experiments on the University of New Mexico's HelCat (Helicon-Cathode) Dual Source Plasma Device have focused on the study of bow shocks formed by the collision of Argon plasma jets launched from a coaxial plasma gun with a cylindrical Pyrex rod placed into the vacuum chamber. The Hel-Cat chamber allows for shock formation in a variety of regimes including gas backfills, background plasmas and background magnetic fields for a magnetized shock case. Several diagnostics have been deployed including high speed imaging, spectroscopy, and Langmuir Probes to measure the shock structure in various regimes. Recent high-speed images, using filters to separate the Ar-I and Ar-II lines, have yielded measurements of the spatial and temporal distribution of ions and neutrals across the shock for each regime. These measurements have also shown evidence of instabilities downstream of the shock front when the jet is launched into an argon gas backfill. These data at each regime will be presented along with initial 2-D hydrodynamic simulations using the University of Chicago's FLASH code.

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