

Abstract Submitted
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Mach Probe Measurements in a Large-Scale Helicon Plasma¹

M.W. HATCH, R.F. KELLY, D.M. FISHER, M. GILMORE, R.H. DWYER, Univ of New Mexico — A new six-tipped Mach probe, that utilizes a fused-quartz insulator, has been developed and initially tested in the HelCat dual-source plasma device at the University of New Mexico. The new design allows for relatively long duration measurements of parallel and perpendicular flows that suffer less from thermal changes in conductivity and surface build-up seen in previous alumina-insulated designs. Mach probe measurement will be presented in comparison with ongoing laser induced fluorescence (LIF) measurements, previous Mach probe measurements, ExB flow estimates derived from Langmuir probes, and fast-frame CCD camera images, in an effort to better understand previous anomalous ion flow in HelCat. Additionally, Mach probe-LIF comparisons will provide an experimentally obtained Mach probe calibration constant, K , to validate sheath-derived estimates for the weakly magnetized case.

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Maren Hatch
Univ of New Mexico

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