

Abstract Submitted  
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**Characterization and Overview of the HELCAT (HELicon-CATHode) Dual-Source Linear Plasma Device**<sup>1</sup> M. GILMORE, C. WATTS, S. XIE, L. YAN, A.G. LYNN, M. CUETO, J. HOLLOWELL, University of New Mexico — The HELCAT (HELicon-CATHode) device is a dual-source linear plasma device that has recently begun full operation at the University of New Mexico. HELCAT is 4 m long, 50 cm diameter, with axial magnetic field  $< 2.2$  kG. An RF helicon source of tunable frequency  $10 - 30$  MHz and  $P < 5$  kW, resides at one end of the device, while a thermionic BaO-Ni cathode capable of discharge currents up to 2.5 kA is located at the other end. Nominal parameters are:  $T_e \sim 5 - 10$  eV,  $n_e \sim 10^{12}$  /cc (cathode),  $10^{13} - 10^{14}$  /cc (helicon), plasma diameter  $15 - 20$  cm. Diagnostics now online include electrostatic and magnetic probes, mm wave interferometry, visible spectroscopy, and LIF. Several basic plasma physics experiments are underway, including active feedback control of turbulent transport, physics of edge convective transport, Alfvén wave-neutral particle interactions, and physics of expanding high density magnetized plasma “bubbles” in the background discharge. An overview of the device characteristics and initial experimental results will be presented.

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Mark Gilmore  
University of New Mexico

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