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Dual-Source Operation of the HelCat (Helicon-Cathode) Device[1]

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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, $n_e \sim 10^{18}$ m^{-3} (cathode), 10^{19}-10^{20} m^{-3} (helicon), plasma diameter 15 – 20 cm. Diagnostics now online include electrostatic and magnetic probes, mm wave interferometry, visible spectroscopy, Mach probes, and LIF. We present first results of operation with both sources simultaneously.

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