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Construction of the HELCAT dual Helicon/Cathode Linear Plasma Device<sup>1</sup> S. WILL, M. GILMORE, C. WATTS, J. HERRERA, A.G. LYNN, University of New Mexico — Construction is nearing completion on a large (0.5m diameter, 4m length) dual source linear plasma device. A 5kW helicon antenna and 6kW, 15cm oxide coated thermionic cathode are to be placed on opposite sides of the device. The helicon source produces plasmas of density  $1-5\times10^{13}$  cm<sup>-3</sup> and is currently operational. The cathode source has shown densities of up to  $1\times10^{12}$  cm<sup>-3</sup> and electron temperatures of ~10eV in a previous device. The plasma is contained by an up to 2.2kG axial field produced by 12 large water cooled magnet coils. The device will be suitable to a wide range of basic physical experiments, including the study of Alfen waves, of interest to space plasmas. Biased concentric rings will be installed on the opposite end from the cathode (removable for helicon operation), which will be capable of generating shear flow for studying the possible active control of turbulent transport.

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