Abstract Submitted
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Progress on the Pre-Stage Magnetic Coil to Enhance Helicon Mode Excitation on the Helicon Plasma Experiment (HPX)[1] C. SCHLANK, R.W. JAMES, J. SHERMAN, S. NOLAN, J. KARAMA, O. DUKETINSON, M. LOPEZ, J. ZUNIGA, E.J. PAGE, B.S. STUTZMAN, R.N. PAOLINO, United States Coast Guard Academy Plasma Lab — HPX is being developed to utilize the reputed high density (10^{13} cm^{-3} and higher) at low pressure (.01 Torr) [1] Helicon Mode Plasmas. HPX Plasmas are created by imparting directed energy into a Pyrex tube preloaded with Ar gas at fill pressures on the order of 10^4 mTorr utilizing an RF power supply and matching box that can deliver about 250 W of power in the 20 MHz to 100 MHz frequency range. It has been demonstrated [1] that a uniform magnetic field in lower energy level plasmas can facilitate a decrease in inertial effects, which promotes energy conservation within the plasma to provide the necessary external energy in the plasma's magnetic field required to reach the Helicon Mode. Initial Hall Effect probe testing and calibration has been successful and installation of a 400 to 1000 Gauss electromagnet is being installed to establish and measure the aforementioned uniform field. An acceleration coil, currently under construction, will be used to increase the plasma velocity to facilitate particle and optical probing within the vacuum chamber, for experimental analysis. Initial accuracy and calibration measurements of the relative magnetic fields, created by both electromagnets and measured by the external Hall Effect Probes, will be reported.

[1] K. Toki, et al., Thin Solid Films 506-507 (2005)

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