Abstract Submitted
for the DPP12 Meeting of
The American Physical Society

Pre-Stage Magnetic Coil to Enhance Helicon Mode Excitation on a Small Helicon Plasma Experiment (HPX)[1] CARTER SCHLANK, ROYCE JAMES, NICHOLAS THAYER, JUSTIN SHERMAN, STEPHEN NOLAN, MICHAEL LOPEZ, USCGAPL — Small helicon plasmas have been employed in various capacities from industry to spacecraft propulsion. At the Coast Guard Academy Plasma Lab (CGAPL), a small Helicon Plasma Experiment (HPX) is being developed to utilize the reputed high density (10^{13} cm^{-3} and higher) at low pressure (.01 T) [1] Helicon Mode Plasmas. HPX will become a high temperature and density diagnostic development test-bed for future laboratory investigations in addition to becoming a tool for future spacecraft propulsion devices. HPX Plasmas are created by imparting directed energy into a Pyrex tube preloaded with Ar gas with fill pressures on the order of 10^4 mTorr utalizing a power supply and matching box can deliver up 250 W of power in a 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 and provids the necessary external energy in the plasma's magnetic field to reach the Helicon Mode. HPX employes an electromagnet to establish this uniform field. An acceleration coil, currently under construction, will be used to increase the plasma velocity to facilitate partcle and optical probing within the vacuum chamber for experimental analysis. Initial accuracy and calibration measurements of the relative magnetic fields created by both electromagnets will be reported.
[1] K. Toki, et al., Thin Solid Films 506-507 (2005).

[1]Supported by U.S. DEPS Grant [HEL-JTO] PRWJFY11.

2/c Carter Schlank
USCGAPL

Date submitted: 05 Jul 2012 Electronic form version 1.4