

Abstract Submitted  
for the DPP12 Meeting of  
The American Physical Society

**Progress in Development of Low Pressure High Density Plasmas on a Small Helicon Plasma Experiment (HPX)**<sup>1</sup> ROYCE JAMES, M. LOPEZ, S. NOLAN, E.L. PAGE, C. SCHLANK, J. SHERMAN, B.S. STUTZMAN, J. ZUNIGA, US Coast Guard Academy — At the Coast Guard Academy Plasma Lab (CGAPL), a small Helicon Plasma Experiment (HPX) is being developed to utilize the reputed high densities ( $10^{13}$  cm<sup>-3</sup> and higher) at low pressure (.01 T) [1], for eventual high temperature and density diagnostic development in future laboratory investigations. HPX is designed to create repeatedly stable plasmas induced by an RF frequency in the 10 to 70 MHz range and employs an electromagnet to provide the external energy in the plasma's magnetic field to transition from the H-Mode to the Helicon Mode. An acceleration coil, currently under construction, will place the plasma in the vacuum chamber for optical and particle probing. With the initial construction phase complete and first plasmas attained, HPX is constructing triple and mach particle probes, magnetic probes, and a single point 300 W Thompson Scattering system backed by a 32-channel DAQ system capable 12 bits of sampling precision at 2 MS/s for plasma property investigations. Progress on the development of the RF coupling system, magnetic coils, and qualitative observations from the optical and electric diagnostics are to be reported.

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

<sup>1</sup>Supported by U.S. DEPS Grant [HEL-JTO] PRWJFY12.

Royce James  
US Coast Guard Academy

Date submitted: 18 Jul 2012

Electronic form version 1.4