Abstract Submitted
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Progress on Development of Low Pressure High Density Plasmas on the Helicon Plasma Experiment (HPX)[1] R.W. JAMES, O. DUKETINSON, S. NOLAN, E.J. PAGE, M. LOPEZ, J. KARAMA, R.N. PAOLINO, C. SCHLANK, J. SHERMAN, B.S. STUTZMAN, P.B. CRILLY, U.S. 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^{-3} 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. We employ a 400 to 1000 Gauss electromagnet that promotes energy conservation in the plasma via external energy production in the magnetic field facilitated by decreased inertial effects, in order to reach the Helicon Mode. With the initial construction phase complete and repeatable 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 Data Acquisition (DAQ) system capable 12 bits of sampling precision at 2 MS/s for HPX plasma property investigations. Progress on the development of the RF coupling system, Helicon Mode development, magnetic coils, and observations from the optical, particle, and electromagnetic scattering diagnostics will be reported.

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

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