

Abstract Submitted
for the DPP19 Meeting of
The American Physical Society

Baseline Plasma Diagnostics Development on the Helicon Plasma Experiment (HPX)¹ R. W. JAMES, United States Coast Guard Academy, L. A. ALLEN, US Coast Guard Academy, R. W. FREEMAN, United States Coast Guard Academy, A. GREEN, A. LEHENBAUER, US Coast Guard Academy, R. N. PAOLINO, United States Coast Guard Academy, M. ROSALES, Connecticut College, I. FROMMER, US Coast Guard Academy, C. MOORE, United States Coast Guard Academy — HPX at the Coast Guard Academy Plasma Lab (CGAPL) continues to progress toward utilizing the reputed high densities (10^{13} cm⁻³ and higher) at low pressure (.01 T) of helicons, for eventual high temperature and density diagnostic development in future laboratory investigations. HPX has installed an Impedans Langmuir probe and constructed an RF-shielded triple probe experimental diagnostic to compare the plasma's density, temperature, and behavior during experiments. Our 2.5 J YAG laser Thomson Scattering (TS) system operates at its first and second harmonic, 532 and 1064 nm respectively. It utilizes a high-performance VPH grating spectrometer and a charge coupled device (CCD) camera with a range of 380-1090 nm with a resolution of 1024x1024 for second harmonic (532 nm) photon emissions. At 1064 nm, a new polychromator has been procured from General Atomics optimized for TS measurements of $5 \text{ eV} < T_e < 2000 \text{ eV}$ over a 109-degree scattering angle. Progress on the construction of the RF coupling system, Helicon Mode development, and observations from Thomson Scattering, particle, and electromagnetic scattering diagnostics will be reported.

¹Supported by U.S. DEPS Grant [DE-JTO] PRWJFY19

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Date submitted: 08 Jul 2019

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