

Abstract Submitted  
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**Experimental characterization and equilibrium reconstructions of first electron cyclotron heated plasmas in the low-aspect ratio CNT stellarator** KENNETH HAMMOND, ALEK ANICHOWSKI, FRANCESCO VOLPE, YUMOU WEI, Columbia University, SAMUEL LAZERSON, Princeton Plasma Physics Laboratory — Neutral plasmas started up and sustained by electron cyclotron resonance heating are a current topic of study in the CNT stellarator. Langmuir probe measurements suggest that the microwave heating maintains a bi-Maxwellian electron distribution, and that the plasma density decays on a millisecond time scale when heating ceases. Furthermore, a Langmuir probe mounted on an electronic moving stage measures profiles of plasma temperature and density with very high spatial resolution. These profiles show evidence of magnetic islands, in agreement with electron-beam mapping of the vacuum magnetic field. Previous results suggest that the vacuum islands result from error fields due to coil misalignments [1]. We present ongoing work to reproduce these field errors with Biot-Savart calculations that account for coil misalignments. We also present results of VMEC [2] free- and fixed-boundary calculations of CNT equilibria and ongoing work to upgrade the ECRH system from 1 to 16 kW.

[1] P. Traverso et al., *Bull. Amer. Phys. Soc.* **55**, Poster CP9-11, 2010.

[2] S. P. Hirshman and J. C. Whitson, *Phys. Fluids* **12**, 1983.

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