Abstract Submitted
for the DPP09 Meeting of
The American Physical Society

Electrostatic Charging of Insulating Rods and Resulting Particle Transport in the Columbia Non-neutral Torus[1] AARON SENTER, NIKOLAUS RATH, PAUL BRENNER, XABIER SARASOLA, THOMAS PEDERSEN — The Columbia Non-neutral Torus (CNT) is a stellarator created to study non-neutral plasmas confined on magnetic surfaces. To create and diagnose the electron plasma, filaments supported by ceramic rods are inserted into the plasma. These rods charge negatively allowing particles to $\vec{E}\times\vec{B}$ drift across the confining magnetic surfaces and out of the plasma. A simple model of this process has yielded good qualitative agreement with experimentally observed radial transport[1]. However, when the rod is retracted, it perturbs the plasma more than expected. To better understand the rod perturbations, externally biased conducting rods are now being used. We find the effect of the ceramic rods by measuring the increase in filament emission current with a rod installed. Comparing the radial transport rates of the ceramic and conducting rods, we aim to understand the charge distribution on the former, and to minimize the rod driven transport. Initial experiments show that a uniformly biased rod does not reproduce the transport observed. Experiments using a rod with a varying radial potential profile are being conducted and will be reported on. [1] J.W. Berkery *et al.*, Phys. Plasmas **14**, 062503 (2007).

[1]Supported by the NSF CAREER Program, Grant no PHY-04-49813.

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Date submitted: 17 Jul 2009 Electronic form version 1.4