

Abstract Submitted
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Installation and Operation of a Conducting Boundary in the Columbia Non-Neutral Torus P.W. BRENNER, T. SUNN PEDERSEN, J.W. BERKERY, R.G. LEFRANCOIS, M.S. HAHN, Q.R. MARKSTEINER, Columbia University — The Columbia Non-Neutral Torus (CNT) is a compact stellarator, which is currently being used to study non-neutral plasmas confined on magnetic surfaces. Previously, confinement times up to 20 ms have been measured, limited in part by enhanced transport caused by potential variation along magnetic surfaces. Conducting meshes that conform to the last closed magnetic surface were recently installed in CNT. These meshes create an equipotential boundary at the last closed surface, improving the match between equipotential and magnetic surfaces as well as offering new non-intrusive methods to diagnose the plasma. The conducting mesh boundary is composed of 13 individual sectors that can act as probes. These probes can measure the decay of an induced image charge, plasma oscillations, or actively drive oscillations to diagnose the plasma properties. A description of the apparatus and the results of initial experiments are presented. A limiter probe surrounding the majority of a cross section has also been inserted to directly measure confinement by the decay of electron flux. Experiments have been completed demonstrating that electron flux to a point probe at the last closed flux surface accounts for less than 10 percent of all the electrons leaving the magnetic surfaces. These results and their implications for a limiter probe diagnostic will be discussed.

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