

Abstract Submitted
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Confinement of Pure Electron Plasmas in the Columbia Non-neutral Torus¹ P.W. BRENNER, T. SUNN PEDERSEN, M.S. HAHN, X. SARASOLA, Columbia University — The plasmas studied in the Columbia Non-neutral Torus are uniquely different from non-neutral plasmas in other magnetic geometries. Confinement is primarily limited by transport resulting from insulating probes inserted into the plasma and electron neutral collisions. Recently the best measured confinement time has been increased by over an order of magnitude to 323 ms. The magnetic geometry allows for confinement of plasmas with arbitrary degree of neutralization but the geometry's complexity also introduces new challenges and sources of transport. An improved conducting boundary is being designed and installed to minimize potential variation along magnetic surfaces and externally diagnose the plasma. Three stellarator configurations can be studied in CNT by varying the angle between coils. Progress toward a comparison of each configuration will be presented. Methods to create plasmas unperturbed by internal rods and diagnose the plasma at or outside the edge are described and initial results are presented. A thorough understanding of these methods is a significant step towards the goal of studying electron-positron plasmas.

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