

Abstract Submitted
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First Experiments with the Retractable Electron Emitter on the Columbia Non-neutral Torus JOHN BERKERY, THOMAS PEDERSEN, LUIS SAMPEDRO, ANDREI PETRENKO, QUINN MARKSTEINER, JASON KREMER, REMI LEFRANCOIS, Columbia University — One goal of the Columbia Non-neutral Torus research program is to investigate the possibility of enhanced confinement in stellarators due to high electric fields. Non-neutral plasmas with high electric fields are predicted to have long confinement times. Pure electron plasmas have recently been created in the CNT stellarator, however, it was seen that the factor limiting confinement was the presence of ceramic rods holding a probe array and an electron emitter in the plasma. The confinement time was measured to be 20 ms, much shorter than the theoretically possible confinement times in the device. In order to realize the possible enhanced confinement times, a retractable electron emitter has been employed. The electron emitter is able to retract from the core of the plasma to the edge in 20 ms. Using a capacitive sector probe, we will be able to measure the decay of the image charge of the plasma and hence determine the confinement time in an unperturbed manner. Results from first experiments with the retractable emitter will be presented and discussed.

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