

Abstract Submitted
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Spectroscopic Measurements of Non-Hydrogenic Compact Toroids on CTIX¹ D.Q. HWANG, University of California, Davis, D. BUCHENAUER, Sandia National Laboratories, R.D. HORTON, R.W. EVANS, R. KLAUSER, University of California, Davis, J.A. WHALEY, B.E. MILLS, Sandia National Laboratories — The CTIX device is currently being used to investigate the production of compact-toroid plasmas consisting primarily of high-Z ions, using ionization and accretion of high-Z neutrals in the acceleration region. The axial density profile of the high-Z ions will be determined by transverse spectroscopic measurements, which are able to identify particular ion species. Ion velocity can then be deduced from axial time of flight. In addition, high-resolution spectroscopy will be used to directly measure high-Z ion velocity via Doppler shifts. These results are important in determining the degree of slip of high-Z ion velocity relative to CT magnetic field. Scaling of this slippage can be measured as a function of ion species, magnetic field strength, and gas injection location, and compared with a test-particle simulation. The results are relevant to determining the ability of the CT to penetrate a magnetic field, either for the purposes of shock formation study, or for applications to runaway electron suppression in large tokamak experiments. Beneficial effects, in terms of discharge reproducibility and surface durability, for a new tungsten-coated inner electrode will also be presented, along with a design for improved diagnostic access through the outer electrode.

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D. Buchenauer
Sandia National Laboratories

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