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High-Z Compact Toroid Acceleration on CTIX DAVID HWANG, ROBERT HORTON, RUTH KLAUSER, RUSSELL EVANS, UC Davis, DEAN BUCHENAUER, Sandia National Laboratory, Livermore — Experiments on the Compact Toroid Injection Experiment (CTIX) are being performed to demonstrate efficient production of CT plasmas of high average atomic mass, typically using hydrogen in the formation region, and noble-gas (He, Ne, Ar, Kr) species accreted by gas puffing in the acceleration region. An important application of high-Z CTs is the suppression, by a combination of collisional and bremsstrahlung effects, of highly-relativistic electrons produced by disruptions in large tokamaks. Recent improvements to CTIX include increased accelerator-region gas puffing locations and interferometer diagnostics, improved spectroscopy, and a new uncoated stainless-steel inner electrode. Plasma parameters and surface modification obtained with the uncoated electrode will be determined for later comparison with a tungsten-coated Inconel inner electrode of otherwise identical electrode shape. The goal is to demonstrate production of high-Z CTs with kinetic energy density relevant to central-axis penetration for runaway suppression in large tokamaks. Supported by US DOE grants DE-AC04-94AL85000 and DE-FG02-03ER54732.

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