

Abstract Submitted  
for the DPP05 Meeting of  
The American Physical Society

**Accelerator-Region Gas Puffing Experiments on CTIX** ROBERT HORTON, STEPHEN HOWARD, SAM BROCKINGTON, RUSSELL EVANS, DAVID HWANG, University of California, Davis — The technique of gas puffing into the acceleration section of the CTIX device has proven to be a simple and reliable method to increase plasma density by a factor of five or more. The resulting plasma maintains the internal poloidal field characteristic of the spheromak-like compact toroid (SCT), although typically at reduced field strength. With proper choice of timing and gas puff intensity, no special measures, such as external magnetic fields, are required to prevent premature breakdown in the acceleration region. The option of puffing a different gas in formation and acceleration regions allows original and added plasma components to be distinguished spectroscopically. A detailed survey of operating conditions will be presented, in which CTIX operating voltages, formation plasma density, accelerator gas valve timing, duration, and operating pressure, are systematically varied. Major diagnostics include upstream and downstream laser interferometers, axial and azimuthal magnetic field probes, and filtered photodiodes; fast cameras in a drift region downstream from the accelerator; and axially-viewing photodiodes and camera. A goal of the experimental series will be to maximize SCT kinetic energy density, the parameter which determines ability of the SCT to penetrate magnetic fields. Supported by U.S. DOE Grant DEFG0203ER54732

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Date submitted: 22 Jul 2005

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