

Abstract Submitted  
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**Poloidal flux from Coaxial Helicity Injection in NSTX**<sup>1</sup> D. MUELLER, R. BELL, B.P. LEBLANC, A.L. ROQUEMORE, Princeton University, R. RAMAN, T.R. JARBOE, B.A. NELSON, University of Washington, S.A. SABBAGH, Columbia University, V.A. SOUKHANOVSKII, Lawrence Livermore National Laboratory, NSTX TEAM — Transient coaxial helicity injection (CHI) has been employed on the National Spherical Torus Experiment (NSTX) to produce plasmas that can be ramped-up in current by induction. A capacitor bank of up to 50 mF charged up to 1.75 kV is connected across the electrically isolated inner and outer vacuum vessel segments by an ignitron switch. As the injector current ( $I_{inj}$ ) linking the inner and outer divertors increases, the  $J_{pol} \times B_T$  force overcomes the field line tension and the plasma expands until it fills the torus volume. After a pre-programmed time (typically 2.5 to 5 ms) near the peak in the toroidal current, the capacitor bank is diverted into a low resistance by a second ignitron. The plasma detaches from the electrodes to form closed flux surfaces. CHI discharges with up to 0.3 MA of toroidal plasma current have been ramped up inductively to reach higher final current with higher poloidal flux than purely inductive discharges with the same applied flux.

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