

Abstract Submitted  
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**Non-inductive Plasma Start-up and Current Ramp-up in NSTX-U**  
R. RAMAN, T.R. JARBOE, B.A. NELSON, Univ. of Washington, D. MUELLER, S.C. JARDIN, C.E. KESSEL, PPPL and The NSTX Research Team — Results from NSTX Transient Coaxial Helicity Injection (CHI) experiments have demonstrated generation of 300kA start-up currents, and when these discharges were coupled to induction they attained 1MA of plasma current consuming 65% of the inductive flux of standard inductive-only discharges in NSTX. In addition, the CHI-initiated discharge has lower plasma density and a low normalized internal plasma inductance of 0.35, as needed for achieving advanced scenarios in NSTX-U. CHI will be used for generating the initial seed current for non-inductive current ramp-up and non-inductive current sustainment in NSTX-U. Improved positioning of the injector flux generating coils on NSTX-U substantially increases the CHI current generation potential in NSTX-U. Scenario modeling results using the TSC code for full non-inductive start-up using CHI and subsequent non-inductive current ramp-up using neutral beams and RF will be presented. This work supported by U.S. DOE Contracts DE-AC02-09CH11466 and DE-FG02-99ER54519 AM08.

R. Raman  
Univ. of Washington

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