

Abstract Submitted
for the DPP17 Meeting of
The American Physical Society

CHI Research on NSTX-U W-S LAY, R RAMAN, T.R JARBOE, B.A NELSON, University of Washington, D MUELLER, F EBRAHIMI, M ONO, S.C JARDIN, G TAYLOR, PPPL — At present about 20% of the total plasma current required for sustained operation has been generated by transient CHI. The present understanding suggests that it may be possible to generate all of the needed current in a ST / tokamak using transient CHI. In such a scenario, one could transition directly from a CHI produced plasma to a non-inductively sustained plasma, without the difficult intermediate step that involves non-inductive current ramp-up. STs based on this new configuration would take advantage of evolving developments in high-temperature superconductor technology to develop a simpler design ST that relies primarily on CHI for plasma current generation. Motivated by the very good results from NSTX and HIT-II, we are examining the potential application of transient CHI for reactor configurations through these studies. (1) Study of the maximum levels of start-up currents that could be generated on NSTX-U, (2) application of a single biased electrode configuration on QUEST to protect the insulator from neutron damage in a CHI reactor installation, and (3) QUEST-like, but a double biased electrode configuration for PEGASUS and NSTX-U. Results from these on-going studies will be described. This work is supported by U.S. DOE Contracts: DE-AC02-09CH11466, DE-FG02-99ER54519 AM08, and DE-SC0006757.

Roger Raman
University of Washington

Date submitted: 06 Jul 2017

Electronic form version 1.4