Log #DPP19-2019-000254

Abstract Submitted
for the DPP19 Meeting of
The American Physical Society

Sorting Category: 06.17 (E)

CHI Research on Urania[1] R. RAMAN, University of Washington, J.A. REUSCH, M.W. BONGARD, University of Wisconsin-Madison, F. EBRAHIMI, PPPL, R.J. FONCK, J.A. GOETZ, University of Wisconsin-Madison, T.R. JARBOE, B.A. NELSON, University of Washington, M. ONO, PPPL, G.R. WINZ, University of Wisconsin-Madison — The spherical tokamak (ST) may require and the advanced tokamak would considerably benefit from the elimination of the central solenoid. URANIA is a ST non-solenoidal startup development station under design and fabrication dedicated to solving the startup problem. On URANIA, Transient and Sustained coaxial helicity injection (T- and S-CHI) will be explored, as well as possible synergies of CHI with local helicity injection and EBW heating and current drive. T-CHI has shown promising capability on the HIT-II and NSTX STs. However, in both these machines the vacuum vessel was electrically cut. For reactor applications a simpler biased electrode configuration is required. To develop this capability a single biased electrode is being tested on QUEST, where up to 45 kA of toroidal current has been generated using CHI. URANIA will use a more advanced double biased electrode configuration with optimized injector electrodes and injector poloidal field coils that should allow the T-CHI system to generate 0.3 MA of closed flux current, the limit permitted by the equilibrium PF coils. Present design indicates that standard divertor coils will provide sufficient flux for CHI studies but may be enhanced with increased current capabilities if needed. The CHI design and the CHI research plan for URANIA will be described.

[1]Work supported by US DOE grants DE-SC0019415, DE-SC0019008, DE-AC02-09CH11466, DE-SC0010565

Abstract *Limit*

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☐ Prefer Oral Session
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Date submitted: 28 Jun 2019 Electronic form version 1.4