Abstract Submitted
for the DPP08 Meeting of
The American Physical Society

Time Dependent Simulation of Energetic Ion Tail Formation Coupled to Thermal Plasma Transport[1] D.B. BATCHELOR, L.A. BERRY, D.E. BERNHOLDT, W. ELWASIF, E.F. JAEGER, V.E. LYNCH, ORNL, R.W. HARVEY, CompX, A. BADER, P.T. BONOLI, MIT, S.C. JARDIN, L-P. KU, PPPL, SWIM SCIDAC TEAM — Energetic ion populations have long been observed in tokamak plasmas heated by high power electromagnetic waves in the ion cyclotron range of frequencies. Previous self-consistent simulations [1] of these tails have involved iteration between an RF field solver and a Fokker-Planck solver to find stationary field and particle distributions assuming fixed thermal plasma profiles. Now, using the SWIM Integrated Plasma Simulator framework to couple the AORSA full-wave RF code, the CQL3D Fokker-Planck solver and the TSC tokamak simulation code, we are able to perform time-dependent simulations describing the evolution of the tail population including its effect on heating of the thermal plasma. Comparison will be presented with charge exchange neutral particle analysis measurements on Alcator C-Mod. [1] E.F. Jaeger, L.A. Berry, S.D. Ahern, et al., Phys. Plasmas 13, 056101-1 (2006).

[1]This research used resources of the National Center for Computational Sciences at Oak Ridge National Laboratory, supported by Office of Science of the U.S. Department of Energy under Contract No. DE-AC05-00OR22725.

D.B. Batchelor
ORNL

Date submitted: 17 Jul 2008 Electronic form version 1.4