Abstract Submitted
for the DPP11 Meeting of
The American Physical Society

Full-wave ICRF simulations with non-Maxwellian particle distributions[1] E.J. VALEO, PPPL, J.C. WRIGHT, MIT PSFC, C.K. PHILLIPS, PPPL, P.T. BONOLI, MIT PSFC, E.F. JAEGER, EXCEL Engineering, L.A. BERRY, ORNL, R.W. HARVEY, CompX — RF induced departure of particle distribution functions from local Maxwellians affects, in general, the amount of single pass absorption, the absorption profile and the distribution of absorbed energy amongst species. The capability to incorporate general distribution functions in the TORIC full-wave finite Larmor radius field solver has been rewritten and optimized so that the additional computational burden (compared to the Maxwellian case) is modest ($< 30\%$). Progress toward fully self-consistent simulations to be obtained by iterating between TORIC field solutions and CQL3D Fokker Planck solutions for the bounce-averaged distribution will be described. Self-consistency is achieved in these simulations by re-evaluating the plasma conductivity using the non-thermal particle distribution from the most recent calculation by the Fokker Planck solver. Likewise, the ICRF wave fields from the most recent field solve are used to evaluate the RF diffusion coefficient that is used to advance the non-Maxwellian particle distribution. This effort complements previous research with the AORSA+CQL3D package, but is specialized to the FLR regime.

[1]Work supported by USDOE contract DE-AC02-09CH11466.

E. J. Valeo
PPPL

Date submitted: 21 Jul 2011 Electronic form version 1.4