Abstract Submitted
for the DPP11 Meeting of
The American Physical Society

Anti-alias filter in AORSA for modeling ICRF heating of DT plasmas in ITER[1] L.A. BERRY, D.B. BATCHELOR, Oak Ridge National Laboratory, E.F. JAEGER, XCEL Engineering, Inc., RF SCIDAC TEAM — The spectral wave solver AORSA [1] has been used extensively to model full-field, ICRF heating scenarios for DT plasmas in ITER. In these scenarios, the tritium (T) second harmonic cyclotron resonance is positioned near the magnetic axis, where fast magnetosonic waves are efficiently absorbed by tritium ions. In some cases, a fundamental deuterium (D) cyclotron layer can also be located within the plasma, but close to the high field boundary. In this case, the existence of multiple ion cyclotron resonances presents a serious challenge for numerical simulation because short-wavelength, mode-converted waves can be excited close to the plasma edge at the ion-ion hybrid layer. Although the left hand circularly polarized component of the wave field is partially shielded from the fundamental D resonance, some power penetrates, and a small fraction (typically $< 10\%$) can be absorbed by the D ions. We find that an anti-aliasing filter is required in AORSA to calculate this fraction correctly while including up-shift and down-shift in the parallel wave spectrum.

[1] E.F. Jaeger, L.A. Berry, E.F. D'Azevedo, *et al.*, Phys. Plasmas **8**, 1573 (2001).

[1]Work supported by U.S. DOE under Contract DE-AC05-00OR22725 with UT-Battelle, LLC.

Erwin Jaeger
XCEL Engineering, Inc.

Date submitted: 11 Jul 2011 Electronic form version 1.4