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Self-consistent simulations of rf heating in the ion cyclotron range of frequencies D.L. GREEN, E.F. JAEGER, L.A. BERRY, Oak Ridge National Laboratory, M. CHOI, General Atomics, RF-SCIDAC TEAM[1] — The rf-SciDAC collaboration is developing computer simulations to predict the damping of radio frequency (rf) waves in fusion plasmas. The recent iterative coupling of the all-orders spectral wave solver AORSA to the Monte-Carlo particle codes ORBIT-rf and sMC+rf allows finite width ion orbits and rf induced spatial transport to be studied in the ion cyclotron range of frequencies [Green et al., *Proc. of 18th Topical Conference on Radio Frequency Power in Plasmas, Gent, Belgium*]. Here we investigate the effects of including finite ion orbits and the importance of using the full $\vec{k}$ spectrum when constructing the quasi-linear (QL) rf heating operator. Power absorption and deposition results for simulations with and without finite ion orbits and for various QL heating operators are compared for heating scenarios including minority H on Alcator C-Mod, beam heating on DIII-D and high harmonic fast wave heating on NSTX. Additionally we present the preliminary results of extending AORSA to calculate the linear wave solution in the open field line region outside the last close flux surface on NSTX.

[1]See author list of Jaeger et al., Phys. of Plasmas, 15, 072512 (2008), DOI: 10.1063/1.2959128

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