

Abstract Submitted
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Comparison of Monte-Carlo Ion Cyclotron Heating Model with Full-Wave Linear Absorption Model¹ M. CHOI, V.S. CHAN, GA, L.A. BERRY, E.F. JAEGER, D. GREEN, ORNL, P. BONOLI, J. WRIGHT, MIT, AND THE RF SCIDAC TEAM — To fully account for the wave-particle interaction physics in ion-cyclotron resonant frequency heating experiments, the 5-D Monte-Carlo code ORBIT-RF is being coupled with the 2-D full wave code AORSA to iteratively evolve ion distribution in x-v space that is used to update the dielectric tensor in AORSA for evaluating the full-wave fields. It is demonstrated that using the full-wave fields from a Maxwellian dielectric tensor in AORSA and confining the resonant ions to their initial orbits in ORBIT-RF, ORBIT-RF largely reproduces the AORSA linear wave absorption profiles for fundamental and higher harmonic ICRF heating. An exception is an observed inward shift of the ORBIT-RF absorption peak for high harmonics near the magnetic-axis compared with that of AORSA, which can be attributed to a finite orbit width effect. Analysis of power absorption in velocity space confirms that significant power is absorbed by energetic particles with their banana tips at resonance locations.

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