Abstract Submitted
for the DPP08 Meeting of
The American Physical Society

Ion Finite Drift Orbit Effect in ICRH Modeling Using Quasi-Linear Full Wave and Particle[1] M. CHOI, V.S. CHAN, General Atomics, L.A. BERRY, E.F. JAEGER, RF Sci DAC — The simulation package of 2-D linear full wave code (AORSA) and 3-D bounce averaged Fokker-Planck (F-P) code (CQL3D), have been extensively used to interpret present-day ICRF wave heating experiments in tokamaks and to predict future burning plasma experiments such as ITER. Assumed in this approach is zero orbit width and constant wave-particle interaction time. To evaluate the limitations of these assumptions, a 5-D Monte-Carlo Hamiltonian ion guiding center code, ORBIT-RF, has been developed, that includes finite orbit effect and a more accurate treatment of the wave-particle interaction time that are not currently implemented in AORSA and CQL3D. Extensive benchmarking activity is carried out to model the fundamental to high harmonic ICRF wave heating in the Alcator C-Mod and DIII-D tokamaks. Comparisons will be presented and discussed. Specifically, the results indicate that ion finite drift orbit effect becomes more significant for the interpretation of ICRF wave-fast ion interactions at high harmonics in DIII-D tokamak.

[1]Supported by the US DOE under DE-FG03-95ER54309 and SciDAC RF grant.

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Date submitted: 22 Jul 2008 Electronic form version 1.4