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[**X**] Theory [ ] Experiment

Finite Orbit Monte Carlo Simulation with Full Wave Fields for ICRF Wave Heating Experiments in DIII-D, NSTX, KSTAR and ITER,* M. Choi, V.S. Chan, L.L. Lao, *General Atomics*, D.L. Green, *ORNL*, W.W. Heidbrink, C.M. Muscatello, *UCI*; and RF SciDAC – Fast-ion spatial profile measured by fast ion D_α (FIDA) diagnostic in DIII-D and NSTX high harmonic ICRF heating experiments indicates outward radial shifts of fast ions from the magnetic axis. Finite orbit theory suggests that the fast-ion radial excursion may be due to finite drift orbit width effects, which can directly affect the ICRF wave propagation and absorption. Recent ORBIT-RF coupled self-consistently with AORSA simulations predicted outward radial shift qualitatively consistent with FIDA. A noted discrepancy is that simulations compute further outward shift than FIDA. To investigate this discrepancy, we improve physics such as Coulomb collision and quasi-linear heating model, and also develop a synthetic diagnostic technique to explore improved means to best model diagnostic measurements. Effects of this improvement on previous results will be discussed including details of finite orbit effects of fast ions on KSTAR and ITER.

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