

Abstract Submitted
for the DPP05 Meeting of
The American Physical Society

Simulation of Fast Alfvén Wave Interaction with Resonant Ions in Tokamaks Using Monte Carlo Orbit Code Coupled with Full Wave Code¹

M. CHOI, V.S. CHAN, R.I. PINSKER, R. PRATER, General Atomics, P. BONOLI, J. WRIGHT, M. PORKOLAB, V. TANG, R. PARKER, MIT, L.A. BERRY, E.F. JAEGER, ORNL, THE SCIDAC RF PLASMA INTERACTIONS TEAM — Recent DIII-D fast Alfvén FW wave current drive experiments have demonstrated much stronger beam ion acceleration at 4th harmonic than at 8th harmonic. Recent C-Mod fundamental heating experiments have also measured rf-induced non-Maxwellian tails. The Monte-Carlo code, ORBIT-RF provides a comprehensive physics package to investigate the interactions between non-Maxwellian ions with finite orbit and FW. ORBIT-RF coupled with TORIC4 wave fields using a single dominant toroidal and poloidal Fourier mode reproduces qualitatively experimental observations in both C-Mod and DIII-D. This suggests that ORBIT-RF may be used to predictively model the interactions of rf-induced non-Maxwellian ion distribution with FW. To study the contributions of multiple poloidal modes, we will couple the full wave code AORSA to ORBIT-RF to evaluate rf-induced changes in perpendicular energy.

¹Work supported by the US DOE under DE-FG03-95ER54309, DE-FG02-90ER54084, and DE-AC05-00OR22725.

T.S. Taylor
General Atomics

Date submitted: 25 Aug 2005

Electronic form version 1.4