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Category Number and Subject: 5.6.2 DIII-D Tokamak

Theory Experiment

Monte-Carlo Orbit/Full Wave Simulation of ICRF Wave Damping on Resonant Ions in Tokamaks,* M. Choi, V.S. Chan, R.I. Pinsky, *General Atomics*, S.C. Chiu, *Sunrise R&M*, V. Tang, R. Parker, J. Wright, *MIT* – The absorption of ion cyclotron radio frequency (ICRF) waves by resonant ions at ion cyclotron harmonics has been observed experimentally in existing tokamaks such as DIII-D and C-Mod. From NPA energy spectrum measurements, strong enhancement of the tail energy spectrum was observed due to the acceleration of resonant ions by ICRF waves. In this paper, these experimental observations are investigated using the Monte-Carlo rf orbit code ORBIT-RF coupled to the full wave code TPRIC. Well-converged full wave solutions are passed on to ORBIT-RF to calculate the increase in perpendicular energy of resonant ions using a quasi-linear rf diffusion model. The results on validating power balance will be shown together with comparison of power absorption by resonant ion species between ORBIT-RF and TORIC. The results will also be compared against experimental measurements in DIII-D and C-Mod.

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