Mode Conversion Current Drive Studies on Alcator C-Mod*

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Significant changes in the sawtooth period have been observed on Alcator C-Mod in the mode conversion regime with deposition around the q = 1. As the mode conversion layer was swept through the inversion radius in D(^{3}He) plasmas, the period was changed from 3 ms to 12 ms with 2 MW ICRF power. The observed sawtooth period evolution is consistent with the driven current profiles predicted by the full wave code TORIC [1]. The evaluation of the MCCD currents was improved by coupling TORIC to the Fokker-Planck code DKE [2] using a quasilinear diffusion operator evaluated from the TORIC fields [3]. Loop voltage experiments and TORIC simulations suggest that the prospects for net current drive applications in C-Mod are limited. Further MCCD experiments will focus on localized current profile control and sawtooth pacing in presence of energetic minority ions.

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