

ICRF heating with $\omega < \omega_{ci}$ in Alcator C-Mod *

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Resonant absorption of low frequency RF waves (with $\omega < \omega_{ci}$ everywhere for all ions in the plasma) near the shear Alfvén wave layer has been suggested as a possible means of inducing the formation of internal transport barriers via localized RF-driven shear flow [1]. With its high magnetic field capability, $B_T \leq 8T$, and variable ICRF source frequency, Alcator C-Mod is uniquely capable of exploring this regime. Previous numerical studies [2] with the 1D METS all-orders full wave code found that mode conversion of a launched fast wave with $f_{RF} \sim 40$ MHz to a kinetic shear Alfvén wave could occur on the high field side of C-Mod in a 90% H / 10% D plasma at 8T. Initial studies with the TORIC 2D full wave finite Larmor radius code [3] indicate that a global slow wave structure is excited via mode conversion and fills an annular region located at larger minor radii with $\rho > 0.5$. Both codes predict that the launched power will be damped on electrons via this slow wave mode. Results of these simulations will be presented and plans for a possible experiment on C-Mod will be discussed.

[1] C.G. Craddock and P.H. Diamond, PRL 67 (1991) 1535

[2] C. K. Phillips et al, *Radio Frequency Power in Plasmas*, AIP Conf. Proc. 403, [AIP, NY, 1997] 265

[3] M. Brambilla, Plasma Phys. Control. Fusion 44 2423 (2002)

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