

Abstract Submitted
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ICRF Mode Conversion Flow Drive on Alcator C-Mod¹ Y. LIN, J.E. RICE, S.J. WUKITCH, M.J. GREENWALD, A.E. HUBBARD, A. INCE-CUSHMAN, L. LIN, E.S. MARMAR, M. PORKOLAB, M.L. REINKE, N. TSUJII, J.C. WRIGHT, MIT, PSFC — Plasma flow driven by externally launched waves could be important for tokamaks. We have observed both toroidal (V_ϕ) and poloidal (V_θ) flows driven via an ICRF mode conversion (MC) process in D(³He) plasmas on Alcator C-Mod [1, 2]. Strong V_ϕ in the co-current direction is observed by x-ray spectroscopy in L-mode plasmas heated with 50 MHz RF power at $B_{t0} \sim 5.1$ T and $n_{3He}/n_e \sim 8\%$. The central V_ϕ scales with the applied RF power and is at least a factor of 2 more than the intrinsic plasma rotation. The MC ion cyclotron wave (MC ICW) is detected by a phase contrast imaging system. The MC physics have been studied by 2-D full wave TORIC simulation. We hypothesize that an MC scenario where MC slow waves are strongly damped on ions may be necessary for MC flow drive. Momentum transport modeling has been applied to infer the total flow drive force. Results from flow drive optimization experiments will be reported. The feasibility of creating such an MC scenario, thus potentially driving plasma flow, in larger tokamaks like JET and ITER will also be discussed.

[1] Y. Lin et al, Phys. Rev. Lett. 101, 235002 (2008).

[2] Y. Lin et al, Phys. Phys. 16, 056102 (2009).

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