

Abstract Submitted
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ICRF Induced Argon Pumpout in H-D Plasmas at Alcator C-Mod¹ C. GAO, J.E. RICE, MIT-PSFC, M.L. REINKE, University of York, Y. LIN, S.J. WUKITCH, E.S. MARMAR, MIT-PSFC, AND ALCATOR C-MOD TEAM — Argon pumpout during ICRF experiments in H-D plasmas is observed at Alcator C-Mod. This pumpout happens only when 1) the H/D ratio is relatively high ($n_H/n_D \approx 35\% - 65\%$), at which level the H-D mode conversion layer is close to the Ar¹⁶⁺ 2nd harmonic resonance layer, and 2) the ICRF power is above 0.4 MW. At Alcator C-Mod the 80 MHz ICRF is launched from the low-field side, different from the TFR tokamak where the pumpout effect was first reported.² The directly measured Ar¹⁶⁺ and Ar¹⁷⁺ emissivity profiles show that the pumpout happens in all plasma regions for several argon charge states. A scan of H/D ratio shows that the pumpout effect is maximized at $n_H/n_D \approx 42 \pm 5\%$, at which about 80% of argon is pumped out within 50 ms. It is yet to be understood whether the resonant effect or the peripheral/edge effect dominates the pumpout process. Preliminary simulation shows that the pure edge effect cannot fully reproduce the fast response of the core emissivity in the experiments. More analyses will be performed using the time-evolving impurity transport code STRAHL.³

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²TFR Group, Nucl. Fusion **22**, 956 (1982).

³R. Dux, STRAHL User Manual, Preprint IPP (2006).

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