

Abstract Submitted
for the DPP06 Meeting of
The American Physical Society

Recent ICRF Results in Alcator C-Mod¹ M. PORKOLAB, S.J. WUKITCH, Y. LIN, B. LIPSCHULTZ, E. MARMAR, A. PARISOT, M. REINKE, J. RICE, J. TERRY, MIT PSFC, ALCATOR C-MOD TEAM — Up to 6 MW of ICRF power (8 MW source) is available in Alcator C-Mod to heat the plasma in the D(H) or D(3He) minority regimes. The compatibility of high RF power with all metal plasma facing components (Molybdenum tiles in C-Mod) is a critical issue for present and future tokamaks (ie, ITER). We have achieved world record volume averaged plasma pressures (1.8 atm) and record stored energy (250 kJ) in C-Mod with 5.25 MW of net injected ICRF power (5.5 MWm-3) in a freshly boronized machine. The key to high plasma performance was determined to be the control of impurities, particularly Mo.² Since the boronization eroded more quickly for ICRF heated (as opposed to Ohmic) H-modes, enhanced sputtering due to RF sheaths in specific locations is suspect. Experimental results will be presented which explore potential source(s) of Mo impurities due to rapid erosion of the boron layer with intense ICRF power. The main candidate for impurity generation with an impact on central plasma performance is the divertor tile region that is magnetically connected to an active ICRF antenna which then could impact sputtering and erosion of boron by RF sheaths.

¹Work supported by USDoE award DE-FC02-99ER54512.

²B. Lipschultz et al, Phys. Plasmas 13 (2006) 056117

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Date submitted: 31 Jul 2006

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