

Abstract Submitted
for the DPP09 Meeting of
The American Physical Society

A Study of Tungsten Migration in the Alcator C-mod Divertor using Particle Induced X-Ray Emission Analysis HAROLD BARNARD, MIT, DENNIS WHYTE, BRUCE LIPSCHULTZ, FLORENT SAINCT — An ion beam analysis study of campaign integrated, poloidal Tungsten (W) migration patterns in the Alcator C-mod tokamak is presented. Eroded W from a toroidally continuous row of W tiles near the outer divertor strike point is used as a tracer to map W erosion and redeposition onto a set of Mo and W tiles that covered the poloidal extent of the C-Mod lower divertor which were removed following the 2008 experimental campaign. These tiles were examined for W using external (in air) particle induced X-ray emission (X-PIXE) analysis; a highly W sensitive ion beam analysis (IBA) technique in which a characteristic x-ray emission is induced from a material surface as it is exposed to an external proton beam, produced by a electrostatic tandem accelerator. With a set of systematic high spacial resolution measurements ($\sim 3mm$ resolution), complete poloidal profiles of W redeposition have been constructed. These profiles indicate W transport and redeposition of up to $1.5 \times 10^{21} atoms/m^2$ ($\sim 14nm$ of equivalent W thickness) in several regions including the outer divertor, the inner divertor, and inside the private flux region. A comprehensive description and explanation of these results is presented.

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Date submitted: 17 Jul 2009

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