Abstract Submitted
for the DPP07 Meeting of
The American Physical Society

Surface Science Station (S^3): a real-time diagnostic of boronization in Alcator C-Mod[1] ROMAN OCHOUKOV, BRUCE LIPSCHULTZ, DENNIS WHYTE, NIELS GIERSE, M.I.T., SOREN HARRISON, U. Wisconsin — The recently installed Surface Science Station (S^3) was used to study the effectiveness of boronization utilizing electron cyclotron discharge (ECD) plasmas (90%He 10%D_2B_6) in Alcator C-Mod. The boron (B) deposition was measured in real time with a pair of quartz microbalances (QMBs) the faces of which were oriented parallel and perpendicular to the applied magnetic field. A maximum B deposition rate of ∼2.5 nm/min was measured on both QMBs for a chamber pressure of 15 mTorr. The peak deposition took place ∼10 cm outboard from the EC resonance. Decreasing the D_2B_6 throughput (pressure) decreased the B deposition rate, again for both QMBs. Overall, the evidence points to the B deposition being primarily ionic and that B ion Larmor radius effects lead to B deposition on surfaces parallel to the magnetic field (implying B ion temperatures in the range of 10-15 eV). Subsequent application of He-only ECDs showed evidence of the B layers being eroded & redeposited by the plasma with rates 10x lower on the QMB face parallel to the magnetic field compared to the QMB face perpendicular to the field.

[1]Supported by USDoE award **DE-FC02-99ER54512

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Date submitted: 22 Jul 2007 Electronic form version 1.4