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The effect of a field-aligned ICRF antenna on enhanced sheath potentials in Alcator C-Mod[1] ROMAN OCHOUKOV, DENNIS WHYTE, DANIEL BRUNNER, MICHAEL GARRETT, BRIAN LABOMBARD, BRUCE LIPSCHULTZ, JAMES TERRY, STEPHEN WUKITCH, PSFC MIT — Radio frequency (RF) rectification of the plasma potential (Φ_P) is a leading mechanism suspected of causing enhanced sputtering of high-Z metallic plasma facing components in ion cyclotron range-of frequencies (ICRF)-heated discharges on Alcator C-Mod. Previous emissive probe measurements on Alcator C-Mod showed that significant ICRF-enhanced Φ_P's (>100 V) are present on magnetic field lines that map and not map to active ICRF antennas. A "field-aligned" (FA) ICRF antenna has recently been installed in order to minimize these deleterious ICRF-driven effects. The FA configuration of the antenna minimizes oscillating electric fields parallel to the magnetic field, reducing RF rectification. Plasma potentials are measured with probes that directly map along a field line to the antenna. Gas puff imaging (GPI) of density fluctuation flows also infers radial electric fields (E_r = -dΦ_P/dr) in the SOL of ICRF-heated discharges. Initial GPI results show that E_r, and hence Φ_P's, are mitigated in discharges heated with the FA antenna and the reduction is the strongest in field-aligned discharges as compared to non-aligned ICRF antennas. Direct Φ_P measurements on field lines mapped to the active FA antenna will also be presented.

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