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Experimental Study of RF Sheaths due to Shear Alfvén Waves in the LAPD MICHAEL MARTIN, WALTER GEKELMAN, BART VAN COMPERNOLLE, PATRICK PRIBYL, TROY CARTER, UCLA, Dept. of Physics and Astronomy — Ion cyclotron resonance heating (ICRH) is an important tool in current fusion heating experiments and will be an essential part of heating power in ITER. Radio frequency (RF) sheaths in the near-field (at the antenna) and in the far-field (e.g. the divertor region) form during ICRH and may cause deleterious effects, such as destruction of wall materials and plasma impurity generation. In this study a shear Alfvén wave is launched from an antenna in the LAPD bulk plasma ($n_e \sim 10^{12}$ cm^{-3}, $T_e \sim 5$ eV, $B_0 = 1.8$ kG, diameter = 60 cm, length = 18 m) and forms an RF sheath on a limiter plate. Plasma potential rectification is observed with an emissive probe in the bulk plasma only on field lines connected to the limiter. The largest enhancement occurs inside the current channel of the Alfvén wave. Plasma potential measurements at various axial distances from the limiter show the rectification decreases with distance. 2-D maps of plasma potential as well as $\bar{E} = -\nabla\Phi$ will be presented. The scaling of sheath potential with wave power and plasma parameters will also be shown.

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