

Abstract Submitted
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Experimental Study of Radio Frequency Sheaths Created by Fast Wave Antennae¹ MICHAEL MARTIN, BART VAN COMPERNOLLE, TROY CARTER, WALTER GEKELMAN, PATRICK PRIBYL, UCLA, DANIEL A. D'IPPOLITO, JAMES R. MYRA, Lodestar Research Corp. — There is a great deal of interest in radio frequency (RF) sheaths as the result of ion cyclotron resonant frequency heating (ICRF). During high power operation in fusion devices, large RF sheaths on the order of several kV can form on the RF antenna or at the machine wall. These large sheaths are detrimental because of impurity generation, local heating, arcing, etc. A series of experiments at the Large Plasma Device (LAPD) at UCLA is underway to study the generation of RF sheaths on conductors both in the near field and in the far field of the fast wave antenna. A fast wave antenna has been constructed for LAPD and has been shown to launch fast waves. The potential in the RF sheath near a metallic conductor will be probed with Langmuir probes and emissive probes. These probes can be positioned with an accuracy of ten micron perpendicular to the metallic plate, and can thus probe the sheath and pre-sheath over a distance of several cm. The design and first tests of the probe system will be presented as well as antenna coupling studies for different plasma conditions.

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