

**Measurement of lower hybrid waves in scrape off layer using microwave scattering technique in Alcator C-Mod\***

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The direct measurement of lower-hybrid waves in tokamak plasma can provide information on the propagation and absorption characteristics of lower hybrid waves. In Alcator C-Mod, the detection of lower hybrid waves has been proposed to study the wave field structure in the scrape off layer using an O-mode reflectometer system. Unlike traditional reflectometry, the interaction occurs where the resonance (Bragg) conditions are satisfied, and scattered signals are frequency shifted by the frequency of the LH waves. An upgrade to the existing 60 GHz O-mode reflectometer system has been completed to detect both frequency up-shifted and down-shifted scattered signals. Further, a new power detecting electronics has been installed in order to continuously monitor the power spectrum within a discharge. Initial experimental measurements of scattered signals in L-mode and H-mode plasmas are presented. The broadened spectrum of the scattered signals suggests that LH waves are influenced by low frequency density fluctuations. The effects of low frequency density fluctuations on lower-hybrid waves will be examined with ray-tracing and Fokker-Planck codes.

\*Supported by US DOE Awards  
DE-FC02-99ER54512 and DE-  
AC02-09CH11466