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Laboratory measurements of the electron distribution function via whistler wave absorption DEREK THUECKS, FRED SKIFF, CRAIG KLETZING, SCOTT BOUNDS, University of Iowa, STEPHEN VINCENA, UCLA — Measurements of the electron distribution function parallel to a background magnetic field have been made on the Large Plasma Device (LAPD) at UCLA using wave absorption near the electron cyclotron frequency. Whistler waves are launched and received by a pair of dipole antennas immersed in the plasma at two positions along the background magnetic field. The wave frequency is swept from somewhat below up to f_{ce} (the whistler wave resonance frequency). As the frequency is swept, the wave will be resonantly absorbed by those parts of electron phase space density which are Doppler shifted into resonance according to $\omega - k_{\|} v_{\|} = n\Omega_{ce}$. Since the antenna-plasma coupling efficiency can be calculated, a measurement of the wave absorption versus wave frequency can be used to determine the parallel electron distribution function. A thorough discussion of background theory will be given, followed by a presentation of results from experiments performed with B=2300g, n$\sim$6-10x10^{11} cm^{-3}, and $T_e \sim$1-10 eV. Future use of this technique to measure "sloshing" in the electron distribution function due to electron interactions with inertial Alfvèn waves will also be discussed.

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