Abstract Submitted
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Measurements of the Linear Kinetic Plasma Response to Alfvén Waves J.W.R. SCHROEDER, F. SKIFF, G.G. HOWES, C.A. KLETZING, University of Iowa Department of Physics and Astronomy, T.A. CARTER, S. DORFMAN, UCLA Department of Physics and Astronomy — Alfvén waves likely account for a significant fraction of auroral electron acceleration. However, a direct test of electron acceleration by Alfvén waves has never been accomplished. Complex trajectories and limited resolutions have prevented *in situ* observations from completing thorough tests of existing theory. Until now, laboratory diagnostics have not been sensitive to the predicted small fluctuations in the tail of the electron distribution function f_e. A novel diagnostic developed at the University of Iowa uses the absorption of a small-amplitude whistler wave to measure f_e up to 1 keV with 0.1% accuracy. Inertial Alfvén waves ($v_{te}/v_A \sim 0.2$) with $\delta B/B \sim 10^{-5}$ are launched in an overdense plasma at the Large Plasma Device (LaPD) with $B_0 = 1800$G. Under these conditions, only the whistler mode propagates parallel to the background magnetic field at frequencies just below the electron cyclotron frequency. Results show fluctuations in the tail of the distribution function at the frequency of the Alfvén wave. An analytic solution from the Boltzmann equation is used to describe experimental results. Further analysis of measurements is presented and is compared to theoretical predictions.

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