Abstract Submitted
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Progress Towards a Laboratory Test of Alfvénic Electron Acceleration[1] J. W. R. SCHROEDER, F. SKIFF, G. G. HOWES, C. A. KLETZING, University of Iowa, T. A. CARTER, S. VINCENA, S. DORFMAN, University of California, Los Angeles — Alfvén waves are thought to be a key mechanism for accelerating auroral electrons. Due to inherent limitations of single point measurements, *in situ* data has been unable to demonstrate a causal relationship between Alfvén waves and accelerated electrons. Electron acceleration occurs in the inner magnetosphere where the Alfvén speed is greater than the electron thermal speed. In these conditions, Alfvén waves can have an electric field aligned with the background magnetic field $\mathbf{B_0}$ if the scale of wave structure across $\mathbf{B_0}$ is comparable to the electron skin depth. In the Large Plasma Device (LaPD), Alfvén waves are launched in conditions relevant to the inner magnetosphere. The reduced parallel electron distribution function is measured using a whistler-mode wave absorption diagnostic. The linear electron response has been measured as oscillations of the electron distribution function at the Alfvén wave frequency. These measurements agree with linear theory. Current efforts focus on measuring the nonlinear acceleration of electrons that is relevant to auroral generation. We report on recent progress including experiments with a new higher-power Alfvén wave antenna with the goal of measuring nonlinear electron acceleration.

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