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Particle heating and density cavity formation by inertial Alfven waves[1] STEPHEN VINCENA, T.A. CARTER, D.W. AUERBACH, W. GEKELMAN, UCLA Basic Plasma Science Facility — Shear Alfvén waves in the inertial regime ($\omega/k_{\|} > \sqrt{2}v_{Te}$) with transverse wavelengths on the order of the electron inertial length are commonly observed in the earth's low-altitude auroral zones. These regions are also replete with observations of electron beams and transversely heated ions. The auroral plasma environment is further enriched by the presence of field-aligned depletions in plasma density, and it has been suggested[2] that the Alfvén waves may, in fact, be the cause of the erosion of ionospheric density. Laboratory experiments aimed at modeling the inertial Alfvén wave-plasma interaction are ongoing at UCLA's Basic Plasma Science Facility in the Large Plasma Device (LAPD). In LAPD, shear waves are launched using antennas which have a current path in the plasma parallel to the background magnetic field. The waves are shown to heat both ions and electrons, create depletions in plasma density, and modify the plasma potential profile. Measurements will be presented for Alfvén wave propagation in a uniform magnetic field as well as an increasing field, which approximates propagation along the geomagnetic field.

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[2]Chaston, *et al.*, "Ionospheric erosion by Alfvén Waves," JGR, V 111, A03206, 2006.

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