

Abstract Submitted
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Nonlinear interactions, heating and turbulence associated with large amplitude Alfvén waves in a laboratory plasma¹ TROY CARTER, DAVID AUERBACH, Dept of Physics and Astronomy, UCLA — From a weak turbulence point of view, nonlinear interactions between shear Alfvén waves are fundamental to the turbulent energy cascade in magnetic turbulence. Motivated by this, experiments on the interaction between large amplitude Alfvén waves are being carried out on the the Large Plasma Device (LAPD) at UCLA. Large amplitude Alfvén waves ($\delta B/B \sim 1\%$) are generated either using a resonant cavity (the Alfvén wave MASER²) or loop antennas. Nonlinear interactions between two copropagating kinetic Alfvén waves have been observed³. Strong, localized electron heating during large amplitude kinetic Alfvén wave launch is also observed. The heating results in significant gradients in the electron temperature which in turn excite unstable drift-Alfvén waves. The drift waves then interact with the initial Alfvén wave, leading to sidebands and spectral broadening. Details of these experimental observations will be discussed, as well as future plans for studies of nonlinear processes associated with Alfvén waves in LAPD.

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²J.E. Maggs and G.J. Morales, Phys. Rev. Lett. **91**, 035004 (2003)

³T.A. Carter, B. Brugman, *et. al*, Phys. Rev. Lett. **96**, 15501 (2006)

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