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Generation of Alfvén waves by high power pulse at the electron plasma frequency BART VAN COMPERNOLLE, WALTER GEKELMAN, PATRICK PRIBYL, University of California, Los Angeles — A great deal of research has been done on the interaction of electron plasma waves in a density gradient at the resonant location ($\omega = \omega_{pe}$) in unmagnetized plasmas. The experiment at the LArge Plasma Device (LAPD) at UCLA takes this a step further, by focusing on the interaction with a fully magnetized plasma, capable of supporting Alfvén waves. The plasma is diagnosed with high frequency dipole probes, magnetic pickup loops and Mach probes. Both the ordinary mode (O-mode) and the extraordinary mode (X-mode) are studied. A pulse of high power microwaves is launched into a strongly magnetized plasma. The microwaves (f = 9 Ghz) are beamed across the magnetic field into a radial density gradient. Results show that the microwave interaction leads to heating and bulk ion flows, and generation of Alfvén waves. Data indicate that the Alfvén waves are radiated by the current systems generated by fast electrons in the resonant region. The Alfvén wave amplitude and frequency spectrum are studied for varying background magnetic field, varying input power of the microwaves and varying electron temperature, both in O-mode and X-mode. Studies of the damping mechanism are under way. *This work is funded by the Department of Energy, and more recently by the National Science Foundation. It was performed at the UCLA Basic Plasma Science Facility.*

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