Abstract Submitted
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Studies of the linear and nonlinear properties of Alfvén waves in LAPD[1] TROY CARTER, SETH DORFMAN, WALTER GEKELMAN, SHREEKRISHNA TRIPATHI, BART VAN COMPERNOLLE, STEVE VINCENA, GIOVANNI ROSSI, FRANK JENKO, UCLA — An overview will be given of recent experimental research into linear and nonlinear properties of Alfvén waves in the Large Plasma Device (LAPD). The nonlinear three-wave interaction process at the heart of the parametric decay instability is studied by launching counter-propagating Alfvén waves from antennas placed at either end of LAPD, producing a damped ion acoustic mode.[2] The decay of a lone, large amplitude Alfvén wave has been observed, producing co-propagating daughter waves with characteristics consistent with kinetic Alfvén waves. The process has an amplitude threshold and the frequency of the daughter modes varies with the amplitude of the pump. A new plasma source based on LaB_6 cathode has been added to LAPD, enabling much higher density (x50), electron temperature (x2) and ion temperature (x6). This provides the opportunity to study the physics of waves and instabilities with space and astrophysically relevant β. Topics under investigation include the physics of Alfvén waves in increased β plasmas, electromagnetic effects in drift-Alfvén wave turbulence and the excitation of ion-temperature-anisotropy driven modes such as the mirror and firehose.

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[2]S. Dorfman and T.A. Carter, Phys. Rev. Lett. 110, 195001 (2013)

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