Abstract Submitted
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Stimulated Parametric Decay of Large Amplitude Alfvén waves in the Large Plasma Device (LaPD)[1] S. DORFMAN, T. CARTER, P. PRIBYL, S.K.P. TRIPATHI, B. VAN COMPERNOLLE, S. VINCENA, UCLA — Alfvén waves, the fundamental mode of magnetized plasmas, are ubiquitous in lab and space. While the linear behaviour of these waves has been extensively studied, nonlinear effects are important in many real systems. In particular, a parametric decay process in which a large amplitude Alfvén wave decays into an ion acoustic wave and backward propagating Alfvén wave may be key to the spectrum of solar wind turbulence. The present laboratory experiments aim to stimulate this process by launching counter-propagating Alfvén waves from antennas placed at either end of the Large Plasma Device (LaPD). The resulting beat response has many properties consistent with an ion acoustic wave including: 1) The beat amplitude peaks when the frequency difference between the two Alfvén waves is near the value predicted by Alfvén-ion acoustic wave coupling. 2) This peak beat frequency scales with antenna and plasma parameters as predicted by three wave matching. 3) The beat amplitude peaks at the same location as the magnetic field from the Alfvén waves. 4) The beat wave is carried by the ions and propagates in the direction of the higher-frequency Alfvén wave. Strong damping observed after the pump Alfvén waves are turned off is under investigation.

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