Abstract Submitted
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A laboratory study of a nonlinear interaction between co-propagating kinetic Alfven waves[1] B.T. BRUGMAN, T.A. CARTER, D.W. AUERBACH, S.C. COWLEY, Dept. of Physics and Astronomy and CMPD, UCLA — A study of a beat-wave interaction between kinetic Alfvén waves has been performed in the Large Plasma Device (LAPD) at UCLA[2]. Two co-propagating waves are observed to beat together and drive a strong low-frequency mode which has a normalized amplitude comparable to or exceeding that of the two incident Alfvén waves ($\delta n/n > \delta B/B \sim 1\%$). This low-frequency mode then interacts with the incident Alfvén waves, leading to strong sideband generation. The phase velocity beat-driven mode is consistent with three-wave matching rules, but is not consistent with any linear wave. A nonlinear Braginskii fluid model of the interaction predicts that the beat-driven wave is a quasimode that is really an off-resonance Alfvén wave. The quasimode is driven by nonlinear cross-field convection which is effective due to the short perpendicular scale of the incident Alfvén waves ($k_\perp \gg k_\parallel$). The model predicts a sizable amplitude for the beat-driven response, consistent with experimental observations. Details of experimental observations and the nonlinear model will be presented.

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[2]T.A. Carter, *et al.*, PRL 96, 155001 (2006)

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