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Properties of large amplitude Alfvén waves in a magnetized, order-unity β laboratory plasma CHRISTINA MIGLIORE, Northeastern University, TROY CARTER, University of California Los Angeles, STEVE VINCENA, vincena@physics.ucla.edu, SHREEKRISHNA TRIPATHI, SETH DORFMAN, DAVID HAMILTON, University of California Los Angeles — Alfven waves play an important role in magnetized plasmas in the laboratory, e.g. in fusion plasmas, and in space and astrophysical settings, e.g. in the solar wind. The Large Plasma Device (LAPD) at UCLA as been used to study the linear and nonlinear properties of these important waves, however in a low-beta plasma ($\beta \sim 1 \times 10^{-4}$). A new LaB_6 cathode source has been installed in LAPD, allowing the generation of much higher pressure plasmas; with lowered magnetic field, magnetized plasmas with $\beta \sim 1$ can be generated. New theoretical work by Squire suggests that the firehose instability limits the possible amplitude of Alfvén waves in higher β plasmas [1]. We will report on experiments with large amplitude waves in $\beta \sim 1$ plasmas in LAPD aiming to test this theory and look for other processes that might limit wave amplitude, such as decay instabilities [2].

[1]J. Squire, et al., Ap. J. Lett. 830, L25 (2016)
[2]S. Dorfman T.A. Carter, Phys. Rev. Lett. 116, 195002 (2016)

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