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Resonant Drive and Suppression of Unstable Drift-Alfvén Waves Using Alfvénic Quasimodes D.W. AUERBACH, S. VINCENA, T.A. CARTER, P. POPOVICH, B. FRIEDMAN, D. SCHAFFNER, UCLA — We report here on the interaction between antenna-driven quasimodes and pressure-gradient driven drift-Alfven waves in the LAPD experiment at UCLA. A cylindrical low-density ($1 \times 10^{12}\ cm^{-3}$) depletion in the center of the higher density ($3 \times 10^{12}\ cm^{-3}$) bulk plasma is generated by selectively blocking primary electrons and therefore plasma producton. A broad frequency range (on the order of 10 kHz) of drift-Alfvén waves (DAW) form in the gradient region. Using a dual-strap Alfvén wave antenna, a low-frequency (1 kHz to 30 kHz) beat-wave quasimode between two co-propagating higher frequency Alfvén waves is driven into the cylindrical density gradient region. When the beat-frequency quasi-mode is at the spontaneous DAW frequency, we see resonant driving of the mode. More interestingly, when the quasi-mode is driven off-resonance, we observe strong suppression of the drift-Alfvén instability. By varying the beat-frequency, a range of suppression behavior is achieved. Both single coherent-mode fluctuations and broad-band turbulent fluctuations are suppressed. We provide experimental details of the observed quasimode-DAW interaction and discuss future plans for theory and simulation efforts to uncover the mechanism for the suppression.

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