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Fast Electron Driven Alfvén Eigenmodes in Alcator C-Mod[1] J.A. SNIPES, R.R. PARKER, A. SCHMIDT, G. WALLACE, MIT PSFC — Injecting 300 – 500 kW of Lower Hybrid Current Drive (LHCD) at the very beginning of the discharge, a series of high frequency (200 – 800 kHz) bursting magnetic fluctuations are observed. There are three sets of modes in ms bursts separated by about 100 kHz with the frequency and time separation of the bursts increasing logarithmically in time. The modes begin about 2.5 ms after the start of the LHCD pulse and persist as long as the plasma is well coupled to the LH grill. The mode amplitudes, measured with pick-up coils on the outboard limiter, reach $\tilde{B}_\theta \approx 2 \times 10^{-5}$ T. The frequency sweeping and amplitude of these modes are similar to those of ICRF fast ion driven Alfvén cascades in the current rise[1], but instead are driven by fast electrons and rotate in the electron diamagnetic drift direction. The bursting behavior of the modes is similar to neutral beam driven fishbones[2]. Measurements with a hard x ray imaging array indicate that the fast electron energy reaches up to 80 keV in these very low density plasmas ($\bar{n}_e \leq 2 \times 10^{19}$ m^{-3}).

[1] J A Snipes, et al, *Phys. Plasmas* **12** (2005) 056102. [2] K McGuire, et al, *Phys. Rev. Lett.* **50** (1983) 891.

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Joseph Snipes
MIT PSFC

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