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### Investigation of Edge Localized Modes in Alcator C-Mod<sup>1</sup>

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Characteristics of discrete ELMs produced in Alcator C-Mod discharges of low edge collisionality and high triangularity are examined. These discharges have high values for central  $T_e$  and  $n_e$  (reaching 4.5 keV and  $2 \times 10^{20} \text{ m}^{-3}$  respectively) and good confinement, consistent with ITER98y2 ELMy H-mode scaling. Pedestal temperature heights reach 0.9 keV at densities above  $1 \times 10^{20} \text{ m}^{-3}$ . Studies of the stability of the pedestal profiles to peeling/ballooning modes will be presented. The energy lost per ELM from the H-mode pedestal is  $\sim 10\text{-}20\%$  of the pedestal energy. These ELMs exhibit relatively long-lived precursor oscillations, often with two modes of intermediate ( $n \sim 10$ ) toroidal mode number present. At the ELM “crash” a high frequency ( $\sim 0.5$  MHz), short-lived magnetic oscillation is initiated, and multiple plasma filament structures are expelled into the Scrape-Off-Layer. The initial ELM filaments, “primaries”, are large perturbations to the SOL. The perturbation increases the local  $D_\alpha$  emission by factors ranging from 1.5 (just outside the LCFS) to  $\sim 100$ . In the outboard midplane region the primary filaments have radial extents of 0.5-1 cm and typical radial propagation velocities of 1-2 km/s. The poloidal extent of the filaments is greater than the 4.5 cm diagnostic field-of-view. The initial filaments are followed (at intervals of  $\sim 100 \mu\text{s}$ ) by multiple, less perturbing “secondary” filaments. The radial dynamics of the ELM are also studied at the *inboard* midplane. The perturbation on the inboard edge appears to be a rapid profile relaxation and recovery. The onset of the inboard profile relaxation is sometimes observed to occur *before* filaments are seen on the outboard side.

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