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High Density H-Mode Behavior on Alcator C-Mod[1] ELIZABETH TOLMAN, JERRY HUGHES, BRIAN LABOMBARD, STEVE WOLFE, MIT PSFC — Alcator C-Mod experiments have explored pedestal physics in high-density, stationary enhanced D_α (EDA) H-mode over a range of 2.7 to 7.8 T. Future high toroidal magnetic field devices may wish to operate in stationary ELM-suppressed regimes such as EDA H-Mode to benefit from high confinement while avoiding the risks posed by ELMs; such devices may also want to maximize plasma density. However, prior analysis of C-Mod EDA H-Modes at toroidal magnetic fields between 4.5 and 6 T shows that EDA H-mode Greenwald fraction scales inversely with magnetic field as $f_{GW} \sim B_T^{-.5}$, with only weak dependence on fueling. We use recent C-Mod experiments to extend this scaling to magnetic fields from 2.7 to 7.8 T. In addition, we characterize the shape of high-density C-Mod EDA H-Mode pedestals and study the response of both the pedestal and the edge to efforts to change f_{GW} through gas puffing and modification of plasma current, with suggestions for potential connections to pedestal theory and modeling.

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