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Excitation of unstable TAEs and stable n=0 modes in Alcator C-Mod[1] J. SEARS, A. BADER, R.R. PARKER, MIT PSFC, G.J. KRAMER, PPPL — Toroidicity-induced Alfvén Eigenmodes (TAEs) are weakly damped MHD modes in tokamak plasmas. The modes occur at discrete frequencies near $\omega_{TAE} = v_A/2qR$, $(v_A = B/\sqrt{\mu_0 \rho})$ in a gap of the continuous spectrum of Alfvén waves. Unstable TAEs are excited by ICRF heating of at least 3.5 MW in Alcator C-Mod L-mode plasmas. These unstable modes have toroidal mode numbers in the range of $n = -6$ to $n = 6$. In contrast, stable resonant modes that are observed in these plasmas at similar and lower ICRF powers by the Active MHD diagnostic in the TAE frequency range commonly have toroidal mode numbers of $n = 0$, which precludes a TAE or EAE identity. The origin of these modes is explored with the NOVA-K code, and the destabilizing role of the energetic hydrogen tail as measured by the Neutral Particle Analyzer is presented.

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