

Abstract Submitted
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Influence of ICRF heating on the stability of TAEs¹ J. SEARS, W. BURKE, R.R. PARKER, J.A. SNIPES, S. WOLFE, MIT PSFC — Unstable toroidicity-induced Alfvén eigenmodes (TAEs) can appear spontaneously due to resonant interaction with fast particles such as fusion alphas, raising concern that TAEs may threaten ITER performance. This work investigates the progression of stable TAE damping rates toward instability during a scan of ICRF heating power up to 3.1 MW. Stable eigenmodes are identified in Alcator C-Mod by the Active MHD diagnostic. Unstable TAEs are observed to appear spontaneously in C-Mod limited L-mode plasmas at sufficient tail energies generated by > 3 MW of ICRF heating. However preliminary analysis of experiments with moderate ICRF heating power show that TAE stability may not simply degrade with overall fast particle content. There are hints that the stability of some TAEs may be enhanced in the presence of fast particle distribution tails. Furthermore, the radial profile of the energetic particle distribution relative to the safety factor profile affects the ICRF power influence on TAE stability.

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