

I-mode regime and characterization of the Weakly Coherent Mode (WCM) in Alcator C-Mod

A. Dominguez, M. Churchill, I. Cziegler, P. Ennever, D. R. Ernst, T. Golfinopolous, M. Greenwald, N.T. Howard, A. E. Hubbard, J. W. Hughes, G.J. Kramer, B. LaBombard, C. Lau, Y. Lin, B. Lipschultz, Y. Ma, E.S. Marmor, P. Phillips, M. Porkolab, J.E. Rice, M. L. Reinke, J. L. Terry, A. E. White, D. G. Whyte

The I-mode regime, observed in Alcator C-Mod, is distinguished by L-mode like particle confinement accompanied by H-mode like energy confinement, similar to the “improved L-mode regime” observed on AUG. I-modes are of interest both as a physics case study of particle and energy channel separation, as well as a potential fusion reactor regime. One of the characteristic I-mode features is the presence of a weakly coherent mode (WCM) centered at $\sim 250\text{kHz}$ with a spectral width of $\sim 100\text{kHz}$, localized near the steep ∇T region. The WCM is observed on various diagnostics sensitive to density, temperature and magnetic fluctuations. The relationship between WCM characteristics (intensity, frequency, time evolution, etc.) and both the parameters at the plasma edge such as ∇T_e and ∇n_e , as well as energy and particle transport across the LCFS of the plasma, are of great interest for understanding the I-mode regime. This presentation will be an overview of the I-mode regime, highlighting results from recent C-Mod experiments addressing the relationship between the WCM and pedestal transport.