

High frequency coherent edge fluctuations in a high pedestal pressure Quiescent H-mode plasma

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Abstract. A set of high frequency coherent (HFC) modes ($f = 80\text{--}250$ kHz) is observed with beam emission spectroscopy measurements of density fluctuations in the pedestal of a strongly shaped quiescent H-mode plasma on DIII-D, with characteristics predicted for kinetic ballooning modes (KBM): propagation in the ion diamagnetic drift direction; a frequency near 0.2–0.3 times the ion diamagnetic frequency; estimated toroidal mode numbers of $n \sim 10\text{--}25$; poloidal wavenumbers of $k_\theta \sim 0.17\text{--}0.4$ cm⁻¹; and high measured decorrelation rates ($\tau_c^{-1} \sim \omega_s \sim 0.5 \times 10^6$ s⁻¹). Their appearance correlates with saturation of the pedestal pressure.

This work supported by the U.S. Department of Energy under DE-FG02-89ER53296, DE-FG02-08ER54999, DE-FC02-04ER54698 and DE-FG02-95ER54309.