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Structure and Behavior of the Edge Harmonic Oscillation in Quiescent H-Mode Plasmas on DIII-D[1] G.R. MCKEE, Z. YAN, University of Wisconsin-Madison, K.H. BURRELL, A.M. GAROFALO, General Atomics, B.A. GRIERSON, W.M. SOLOMON, Princeton Plasma Physics Laboratory — The edge harmonic oscillation (EHO) is a steady-state, pedestal-localized instability that is observed in high-performance, ELM-free Quiescent H-mode plasmas. The spatiotemporal characteristics of the EHO have been measured in QH-mode plasmas with a 2D BES array that measures low-k density fluctuations. The skewness of the fluctuation distribution increases radially from -0.5 to +1 near the separatrix, consistent with the radially varying and highly non-sinusoidal harmonic structure. These fluctuation characteristics are qualitatively consistent with an outward particle transport driven by the EHO. The density fluctuation ($\tilde{n}/n$) profile peaks inside the pedestal, near $\rho = 0.90$-0.95, and is observed from $\rho = 0.85$ to the separatrix; the fundamental frequency is typically in the range of 5-15 kHz. The radial structure of the oscillation has a monotonically varying phase shift of approximately 180 degrees across the outer plasma region that changes direction with plasma current, suggesting that the mode structure is impacted by the high edge toroidal rotation velocity.

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