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Role of Edge Turbulence and Flows in the Density Dependence of the L-H Transition Power Threshold on DIII-D[1] G. WANG, T.L. RHODES, W.A. PEEBLES, J.C. HILLESHEIM, E.J. DOYLE, L. SCHMITZ, L. ZENG, UCLA, M.E. AUSTIN, U Texas-Austin, Z. YAN, G.R. MCKEE, U. Wisc-Madison, C.C. PETTY, K.H. BURRELL, J.C. DEBOO, GA, W.M. SOLOMON, PPPL — The trigger mechanism of the L- to H-mode transition is not currently fully understood. Empirical scaling studies of the L-H transition power threshold have discovered global plasma parameter dependences, including a strong density dependence. The current work investigates the potential role of edge turbulence and flows in this density dependence by performing detailed measurements during a density scan experiment on DIII-D. Preliminary analysis indicates that the signatures of geodesic acoustic modes (GAMs) exist in both the perpendicular flow and electron temperature fluctuations ($\tilde{T}_e$) prior to the L-H transition. Both $\tilde{T}_e/T_e$ at the GAM frequency and $\tilde{T}_e/T_e$ of broadband fluctuations are observed to decrease with increasing density. Measurements of density turbulence, $E \times B$ flow, together with linear stability analysis will also be reported.

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