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Theory Experiment

**Role of Edge Turbulence and Flows in the Density
Dependence of the L-H Transition Power Threshold on DIII-D,***

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, ExB flow, together with linear stability analysis will also be reported.

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