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Turbulence and sheared flow structure behind the isotopic and q95 dependencies of the L-H power threshold on DIII-D[1] Z. YAN, G.R. MCKEE, U Wisc-Madison, P. GOHIL, C. PETTY, GA, B. GRIERSON, D. ELDON, PPPL, L. SCHMITZ, T. RHODES, UCLA — Measurements of long wavelength density fluctuation characteristics in the edge of both Deuterium (D) and Hydrogen (H) plasmas across the L-H transition on DIII-D demonstrate the existence of dual frequency counter-propagating modes, which are strongly correlated with a reduced L-H power threshold (P_{LH}). E×B shear near r/a∼0.95-1.0 is larger in D than in H plasmas at low density, and the dual mode is only observed in D plasmas. Such a dual mode is also observed in a q95 scan of the L-H transition in D plasmas when the P_{LH} is lower, where P_{LH} is found to increase with plasma current but with complex density dependence: the largest increase of P_{LH} is seen at $n_e \sim 3.2e19\ m^{-3}$. The complex behaviors of the turbulence characteristics (amplitude, decorrelation rate, etc.) and dual frequency modes interactions all together will impact the flow shear generation, the transition process and the power threshold scaling.

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