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TGLF Analysis of ITG-TEM Transitions in DIII-D Plasmas[1] X. WANG, S. MORDIJCK, College of William and Mary, G.M. STAEBLER, General Atomics, O. MENEGHINI, ORAU — TGLF [1] calculations show that, when adding electron cyclotron heating, DIII-D H-mode plasmas can transit from the ion temperature gradient (ITG) to trapped electron mode (TEM) domain around mid-radius. With different turbulence scale-lengths as well as opposite drift direction, ITG/TEM plasmas have different transport features, and thus lead to different density and rotation profiles. Detailed TGLF sensitivity analysis shows that the trapped electron mode's growth-rate is more sensitive to electron temperature gradient than the density gradient. Furthermore, by varying the input torque from co-IP to counter-IP through neutral beams, the ITG/TEM reversing radial location changes. We compare three parameters: density fluctuations, linear instability growth-rates, and ExB shearing rates in these discharges. We show that, for co- and counter-beam discharges, the ExB shearing rate becomes comparable or even larger than the growth-rate in the plasma edge. However, under balanced beam injection, the growth-rate is always larger than the shearing rate.

[1] G.M. Staebler, et al. Phys. Plasmas **12**, 102508 (2005).

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