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Electron Density Change and Turbulent Particle Transport During the ITG-TEM Transition Process in DIII-D Plasmas[1] X. WANG, S. MORDIJCK, William and Mary, E.J. DOYLE, UCLA, M.E. AUSTIN, UTA, O. MENEGHINI, S.P. SMITH, G.M. STAEBLER, GA — Periodic ECH power is added into neutral beam heated H-mode plasmas in DIII-D, leading to periodic changes in the electron density, electron temperature, and ion temperature. The changes strengthen the drive for trapped electron modes (TEM) while reducing the ion temperature gradient (ITG) instability drive. Linear gyrokinetic calculations show the instability transitions from ITG to TEM only after all these changes. We find the density gradient in the core shows a dependence on the most unstable mode frequency, where R/Ln maximizes near the ITG-TEM transition and decreases towards both the ITG and TEM regions. However, such dependence does not exist near the plasma edge. Both the density rate of change over time and the most unstable mode growth rate increase substantially around ρ=0.75 when ECH is turned on. These results indicate that the particle transport in the plasma edge is different from what was found previously in the plasma core.

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