

Abstract Submitted
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Variation of Turbulence and Transport with the T_e/T_i Ratio in H-mode Plasmas¹ G.R. MCKEE, Z. YAN, R.J. FONCK, I.U. UZUN-KAYMAK, U. Wisc.-Madison, T.L. RHODES, L. SCHMITZ, UCLA, C. HOLLAND, UCSD, A.E. WHITE, MIT-PSFC — Confinement and transport vary strongly with T_e/T_i . Recent experiments on DIII-D have sought to examine the physical mechanisms behind this dependence by systematically varying T_e/T_i in L- and H-mode plasmas, while T_i , rotation, density and gradient scale lengths are held roughly constant. T_e/T_i is increased by 25% (achieving $T_e/T_i \leq 1$) in non-sawtoothed, long-pulse hybrid H-mode plasmas using 3.3 MW of ECH power, reducing τ_E by 30%. The magnitude of low-k density fluctuations, measured with BES, is found to correspondingly increase by 30%-50% over the radial range $0.35 < r/a < 0.8$. This turbulence behavior contrasts with that observed in L-mode experiments, in which confinement is reduced at higher T_e/T_i , but little change is observed in the magnitude of low-k density turbulence. $S(k_r, k_\theta)$ spectra and related turbulence properties for L- and H-mode plasmas will be compared. Calculations of growth rates and predicted turbulence levels will be performed.

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