

Transitions to Improved Core Transport in DIII-D L-mode NCS Discharges¹ M.E. AUSTIN, K.W. GENTLE, University of Texas, K.H. BURRELL, C.C. PETTY, General Atomics, C.L. RETTIG, University of California, Los Angeles—Spontaneous increases in core electron and ion temperature and ion rotation velocity have been observed in DIII-D L-mode discharges with low density and early neutral beam injection. A reduction in turbulent fluctuation level is usually seen coincident with the changes. Many times these improvements in core confinement correlate with a low order rational q value coming into the plasma, but at other times they do not. We explore the possibility of a threshold for this transition by comparing integer q and non-integer q cases. We also investigate in this class of discharges the case with q_{\min} near 1, just before the onset of sawteeth. These discharges exhibit a state that lacks a well-defined layer of reduced thermal diffusivity as seen in higher q transitions but instead exhibits a broad overall improvement in confinement.

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