

Abstract Submitted  
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Sorting Category: 6.6.2 (Experimental)

**Spontaneous Improvement in Core Transport Near Rational  $q$ -Surfaces in DIII-D NCS Discharges**<sup>1</sup> M.E. AUSTIN, K.W. GENTLE, U. Texas, K.H. BURRELL, C.C. PETTY, General Atomics, R.J. JAYAKUMAR, M.A. MAKOWSKI, LLNL, J.E. KINSEY, Lehigh, C.L. RETTIG, T.L. RHODES, UCLA — In DIII-D L-mode discharges with negative central shear, spontaneous transient or stepwise improvements in core confinement are often seen. These changes appear as upward jumps in temperature and toroidal rotation and for most cases are correlated with the minimum in  $q$  being near a low-order rational value. In some cases, for discharges with earlier NBI and higher beta, ITBs have been seen to form at  $q_{min}$  values other than rational. The largest increase in core confinement occurs just after  $q_{min}$  traverses 1.3-1.2 and persists until the first sawtooth crash. For  $q_{min}$  values near 3 and 2, at the start of the core  $T_e$  rise there are dips in temperature outside of the  $q_{min}$  radius and transient drops in edge  $D_\alpha$  intensity. This phenomenon of transient improved confinement in DIII-D may result from good magnetic surfaces near rational  $q$  in a region of zero magnetic shear similar to results from RTP and FTU tokamaks.

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Prefer Oral Session  
Prefer Poster Session

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Special instructions: 3rd Poster in Transport (Core) session (following Greenfield)
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