Abstract Submitted
for the DPP06 Meeting of
The American Physical Society

Anomalous Effects on the Current Evolution in DIII-D[1] T.A. CASPER, R.J. JAYAKUMAR, L.D. PEARLSTEIN, M.A. MAKOWSKI, C.T. HOLCOMB, LLNL, T.C. LUCE, C.C. PETTY, GA, E.J. DOYLE, UCLA — We explore configurations where the current profile formation and evolution exhibit features consistent with non-neoclassical resistive effects or self-organizing mechanisms. In these discharges, evolution of the current density that determines q achieves a stationary configuration where the inductively driven flux diffusion is balanced by external, non-inductively driven current and/or by anomalous flux or current diffusion processes. This stationary evolution of q has been observed in both hybrid and quiescent, high-confinement (QH) modes of operation. By contrasting measurements with the neoclassical evolution, we infer the location and amount of anomalous current diffusion required to maintain these discharges. A hyper-resistive model is applied to provide at least a heuristic understanding of the current evolution observed in QDB modes. We present a combination of experimental data analysis and simulation results using the CORSICA code to demonstrate the anomaly in current profiles and their evolution.

[1]Work supported by U.S. DOE under W-7405-ENG-48, DE-FG02-04ER54698, and DE-FG03-01ER54615.

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Date submitted: 20 Jul 2006 Electronic form version 1.4