Abstract Submitted
for the DPP16 Meeting of
The American Physical Society

Towards a Physics-Based L-H Transition Model[1] L. SCHMITZ, T.L. RHODES, T. NEISER, L. BARDOCZI, F. JENKO, L. ZENG, UCLA, P. GOHIL, C. CHRYSTAL, GA, B.A. GRIERSON, D. ELDON, PPPL, Z. YAN, G.R. MCKEE, U Wisc M, J. BOEDO, UCSD — L-mode turbulence properties, collisionality, and ion transport fluxes across the separatrix are shown to determine the pre-transition ion poloidal and diamagnetic L-mode edge flow and the shear flow amplification triggering the L-H transition. L-mode ion thermal fluxes increase with density above the power threshold minimum, and are higher in hydrogen than in deuterium plasmas. The long-range toroidal ExB flow correlation at the L-H transition trigger time is observed to peak at intermediate plasma density around the L-H power threshold minimum, and is higher in D-plasmas in comparison to H-plasmas, indicating a possible link between trigger physics and power threshold. The turbulence-driven poloidal ion flow is found decisive for initial turbulence suppression, with a Reynolds stress gradient sufficiently large to account for the measured poloidal flow acceleration in the plateau collisionality.

[1]Supported by the US DOE under DE-FG02-08ER54984, DE-FC02-04ER54698, DE-AC02-09CH11466, DE-FG02-89ER53296, DE-FG02-07ER54917.

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Date submitted: 15 Jul 2016 Electronic form version 1.4