Abstract Submitted
for the DPP14 Meeting of
The American Physical Society

Extending the Physics Basis of ITER Baseline Scenario Stability to Zero Input Torque[1] C. PAZ-SOLDAN, T.C. LUCE, A.M. GAROFALO, G.L. JACKSON, R.J. LA HAYE, General Atomics, J.M. HANSON, K.E.J. OLOFSSON, F. TURCO, Columbia U., B.A. GRIERSON, W.M. SOLOMON, Princeton Plasma Physics Laboratory — DIII-D operation at ITER baseline scenario parameters (safety factor$\sim$3, normalized $\beta \sim 2$, low input torque) is challenging due to the destabilization of m/n=2/1 or 3/2 tearing modes that rapidly lead to a loss of H-mode confinement and potential disruption. Despite proximity to stability limits, stationary operation at ITER-equivalent levels of input torque has been achieved with improved correction of DIII-D intrinsic error fields used to remove magnetic braking torques in combination with steady gas flows and pulsed 3D fields used to pace edge-localized mode (ELM) activity. Operation with zero input torque remains elusive. In this regime, ELMs are more difficult to control and toroidal rotation more difficult to sustain. Additionally, the confinement H-factor is found to decrease significantly from large to zero torque, regardless of heating mix. These results indicate that ITER baseline scenario extrapolations derived from discharges with large input torque are likely to be optimistic.

[1]Work supported by the US Department of Energy under DE-FC02-04ER54698, DE-FG02-04ER54761 and DE-AC52-07NA27344.

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Date submitted: 11 Jul 2014

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