## Abstract Submitted for the DPP15 Meeting of The American Physical Society

Elevated- $q_{min}$  Steady-State Scenarios on DIII-D: New Controls and Stability Characterization<sup>1</sup> C.T. HOLCOMB, B.S. VICTOR, LLNL, J.R. FERRON, T.C. LUCE, R.J. LAHAYE, GA, E. SCHUSTER, W.P. WEHNER, U. Lehigh, F. TURCO, Columbia U., W.M. SOLOMON, PPPL — Fully non-inductive, high performance plasmas with  $q_{min} > 1.5$  have been sustained on DIII-D at  $\beta_N >$ 3.5. Since the formation and sustainment of such plasmas entails operation near multiple stability limits there is a sensitivity to variations in conditions that can lead to different results, i.e. tearing modes. The parameter range for stability at high- $\beta_N$  is not well known, and it is unclear if tearing modes are destabilized by neoclassical (i.e. missing bootstrap current) or classical (i.e. tearing too close to ideal-wall kink limit)  $\beta_N$  limits. We present work to improve reproducibility and stability understanding using new controls. Electron cyclotron heating applied at breakdown improves repeatability. Current profile and  $\beta_N$  feedback control are used to obtain equilibria that are assessed for stability and steady-state potential. We discuss the range of stable operation found using these tools and tests designed to identify tearing destabilization mechanisms.

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