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[ ] Theory [X] Experiment

Overview of Recent Steady-State Scenario Experiments on DIII-D,* C.T. Holcomb, *LLNL*; J.R. Ferron, A.M. Garofalo, D.C. Pace, T.W. Petrie, T.C. Luce, C.C. Petty, *GA*; J.M. Park, *ORNL*; W.W. Heidbrink, *UC Irvine*; G.R. McKee, *U. Wisconsin*; T.L. Rhodes, *UCLA;* C. Holland, *UCSD;* F. Turco, *Columbia U*; W.M. Solomon, *PPPL* — On DIII-D, on- and off-axis neutral beams and electron cyclotron heating have expanded access to a wide range of q-profiles. Plasmas with q_{min}=1–3 have been evaluated for high β steady-state operation. With q_{min}>2 and no internal transport barrier, ideal-wall kink mode β_N limits > 4 are calculated but the global energy confinement is low compared to lower q_{min} plasmas. The thermal and fast ion transport dependence on q_{min} will be discussed, as well as the dependence of stability and confinement on ρ_{qmin} and q_0-q_{min}, and the characteristics of plasmas dominated by bootstrap current at high β_P. At intermediate q_{min}≥1.5, high noninductive current fraction is possible with performance that projects to Q~5 in ITER, both in double null and ITER-like shape. Divertor heat flux is reduced using increased radiation from impurity gas injection. At q_{min}~1, "high-li" plasmas transiently reach β_N>5 with excellent confinement, but MHD avoidance and profile control are needed to achieve stationary high performance.

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