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Ballooning Mode Stability for Self-Consistent Pressure and Current Profiles at the H–mode Edge of Tokamaks[1] R.L. MILLER, Y.R. LIN-LIU, T.H. OSBORNE, T.S. TAYLOR, General Atomics — Ballooning Mode limits on the local pressure gradient near the edge of a plasma are of interest for at least two reasons: (1) stability to ballooning modes at the edge of H–mode plasmas is at least a component of various models attempting to explain ELM behavior and (2) the sensitivity of stiff transport models to the magnitude of the edge pressure pedestal has increased the interest in the maximum sustainable pressure gradient near the plasma boundary. This work focuses on evaluating the ballooning mode stability of equilibria constructed with self-consistent profiles near the edge of the plasma, including bootstrap current. A large pressure gradient is added, localized near the edge of the plasma and consistent with the experimentally measured DIII–D profiles which produce a pedestal. Pedestal heights, widths, radial locations of the transition region producing the pedestal, and bootstrap current magnitude are all varied. The bootstrap current is found generally to raise the stability limit for the pressure gradient by reducing the local shear. Full results from the parameter scans will be presented and implications for interpretation of DIII–D data will be discussed.

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