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MHD Stability in Tokamak Discharges with High Squareness[1] J.R. FERRON, C.M. GREENFIELD, E.J. STRAIT, R.J. LA HAYE, G.L. JACKSON, T.H. OSBORNE, GA, B.W. RICE, B.W. STALLARD, LLNL — Discharges with "squareness" (more pronounced corners on the low field side) are expected to have reduced ballooning mode stability limits compared to discharges that are primarily triangular. This property could be useful for controlling the edge parameters in H–mode discharges. Near the discharge edge, access to the ballooning mode 2nd stability region can be eliminated and the first regime marginally stable pressure gradient (P') reduced. An H–mode discharge in this situation would have a reduced edge P' if it is primarily determined by the ballooning mode limit. This would reduce susceptibility to the low-n kink modes driven by high edge P' and current density that typically terminate the high performance phase in VH–mode and NCS-type discharges. Smaller, more benign ELMs would be expected because they would be triggered at lower values of the edge P'. With smaller ELMs that do not affect the discharge core, a core transport barrier could exist in steady state. Numerical stability estimates and first experimental results for DIII–D discharges with increased squareness are presented.

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