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Stability Modeling of DIII-D Discharges with Transport Barriers[1] L.L. LAO, J.R. FERRON, Y.R. LIN-LIU, E.J. STRAIT, A.D. TURNBULL, T.S. TAYLOR, General Atomics, M. MURAKAMI, Oak Ridge National Laboratory — The stability of DIII–D discharges with transport barriers is systematically studied by modeling the pressure profiles using a hyperbolic tangent representation with various radii, widths, and amplitudes. The q profiles are modeled using a spline representation with varying $q(0)$, $q_{\min}$, and $\rho_{q_{\min}}$. The equilibria are computed using the EFIT and the TOQ codes based on the parameters from a strongly shaped high triangurality DIII–D long pulse high performance discharge. Stability against the ideal low $n = 1$ and 2 modes is evaluated using the GATO code with a conducting wall at 1.5 a. The results show that the stability improves with increasing transport barrier width and radius but varies weakly with $q(0)$. When the transport barriers are L–mode like and have narrow widths in the plasma core, the stability is limited by the $n = 1$ mode. When they are H–mode like and have large widths extending toward the edge, the stability is limited by the $n = 2$ mode.

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L.L. Lao
Lang.Lao@gat.com
General Atomics

☐ Prefer Oral Session
☒ Prefer Poster Session

Special instructions: DIII-D Poster Session 1, immediately following H Takahashi

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