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Comparison of Aspect Ratio Effects on Neoclassical Tearing Modes Between DIII-D and NSTX[1] R.J. LA HAYE, R.J. BUTTERY, General Atomics, S.P. GERHARDT, PPPL, S.A. SABBAGH, Columbia U., D.P. BRENNAN, U. Tulsa — Experimental data is analyzed in which $m/n = 2/1$ neoclassical tearing modes self-stabilized; this "marginal point" is valuable for evaluating the relative importance of the terms in the balanced Modified Rutherford equation. DIII-D and NSTX have similar cross-sectional area and shape except for the large difference in aspect ratio. The aspect ratio effects for NTMs explicitly occur in the MRE in the destabilizing helically perturbed bootstrap current term, in the small island stabilizing effects, and in the stabilizing curvature term. The marginal island width on NSTX at $q_{95} \sim 8$ is about three times the ion banana width. This agrees with the $q_{95} \sim 4$ data on DIII-D but is a larger multiple than for DIII-D at $q_{95} \sim 7$. The balance in the MRE indicates that while the stabilizing effect of the curvature term in DIII-D is negligible, it is important in NSTX. The temporal behavior of the mode suggests NSTX operates closer to marginal classical tearing stability, but benefits from the stabilizing effect of curvature.

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