Abstract Submitted
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Sensitivity of Tearing Mode Beta Limits to Rotation and Current Profile[1] R.J. BUTTERY, C.D. CHALLIS, EURATOM/UKAEA Fusion Assoc., R.J. LA HAYE, GA, S.P. GERHARDT, PPPL, DIII-D TEAM, JET TEAM, NSTX TEAM — Unless carefully controlled, 2/1 tearing modes are likely to limit the β of tokamak plasmas with $q = 2$ surfaces. Mode onset may depend on changes to intrinsic tearing stability (Δ') and external triggers. Studies have probed this underlying physics by perturbing plasma rotation and current profiles to determine how these mechanisms apply. On NSTX, $n = 1$ and $n = 3$ braking have been deployed to change rotation profiles at mode onset, and gauge whether action is through rotation shear and so intrinsic island stability, or differential rotation with respect to external triggers. This also provided key measurements of error field tolerability. On DIII-D saturated mode sizes also show a response to rotation changes. On JET the role of intrinsic stability was directly tested in hybrid plasmas, with changes to q profile leading to significant differences in 2/1 β_N limit, identifying optimal conditions for stability. Results to be reported show a significant role of intrinsic tearing stability governing mode onset.

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