

Abstract Submitted
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The Stabilizing Effect of Flow Shear on $m/n=3/2$ Magnetic Island Width in DIII-D¹ R.J. LA HAYE, General Atomics, R.J. BUTTERY, Culham Science Centre — It is found that flow shear has a stabilizing effect on $m/n = 3/2$ neoclassical tearing mode (NTM) islands through a more negative classical tearing stability index Δ' in the DIII-D [1] tokamak. The heating neutral beams are mixed between co- and counter-directions to vary the torque on the plasma and thus the plasma flow (rotation) and flow shear. This is done “shot to shot” in the presence of a “saturated” $m/n = 3/2$ NTM while slowly raising the plasma. A heuristic model for the stabilizing effect of flow shear on Δ' is shown to explain how flow shear acts to reduce NTM island size and obviate the effect of higher beta and concomitant destabilizing helically perturbed bootstrap current.

[1] J.L. Luxon, Nucl. Fusion **42**, 614 (2002).

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