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Theory Experiment

Tokamak MHD Stability at High Beta and Low Plasma Rotation,* A.M. Garofalo, H. Reimerdes, M.J. Lanctot, *Columbia U.*, J.T. Albrecht, *MIT*, M. Okabayashi, W.M. Solomon, *PPPL*, G.L. Jackson, R.J. La Haye, E.J. Strait, *GA* – Recent high-beta DIII-D experiments with the new capability of balanced neutral beam injection show that the resistive wall mode (RWM) remains stable even with significant reductions in the neutral beam torque relative to pure co-injection. Previous DIII-D experiments showed a higher plasma rotation threshold ($\sim 1-3\% \Omega_A$) for RWM stabilization when resonant magnetic braking was used to lower the plasma rotation. We speculate that the previously observed rotation threshold corresponds to the entrance into a forbidden band of rotation that results from torque balance including the resonant field amplification by the stable RWM. Previous and recent experimental data show a bifurcation taking place when the plasma rotation is reduced to half its unperturbed value, consistent with theory [1]. This hypothesis may have implications for both RWM stability and error field tolerances in ITER.

[1] R. Fitzpatrick, *Nucl. Fusion* **33**, 1049 (1993).

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