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Category Number and Subject: 5.6.2. DIII-D Tokamak

[ ] Theory [X] Experiment

Resistive Wall Mode and Plasma Stability at High β and Slow Rotation,* A.M. Garofalo, H. Reimerdes, M.J. Lanctot, *Columbia U.*; M. Okabayashi, H. Takahashi, *PPPL*: G.L. Jackson, R.J. Groebner, R.J. La Haye, E.J. Strait, *GA*; Y. In, J. Kim, *FAR-TECH, Inc.* – DIII-D experiments extended the observation of resistive wall mode (RWM) stabilization by slow plasma rotation to various scenarios, including high-β advanced tokamak scenarios, and confirmed that magnetic feedback increases stability against equilibrium disturbances, such as large ELMs. At high β, magnetic disturbances that resonant with marginally stable RWM can lead, depending on torque input and momentum confinement, to loss of torque balance followed by plasma locking, perturbation growth, and confinement loss. Reconnection may take place once plasma is locked. Magnetic feedback can maintain or quickly restore axisymmetry and avoid locking. With very low torque input, however, error field threshold for locking may be below feedback sensitivity. Residual uncorrected error fields may explain why minimum sustainable rotation profiles are generally higher than those predicted by ideal-plasma RWM stability theory.

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