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[ ] Theory [X] Experiment

Wall-stabilization and Its Limits in High Beta DIII-D Plasmas,* H. Reimerdes, J.W. Berkery, M.J. Lanctot, *Columbia U.*, M.S. Chu, A.M. Garofalo, G.L. Jackson, R.J. La Haye, E.J. Strait, A.S. Welander, *GA*, Y. In, *FAR-TECH,* Y.Q. Liu, *UKAEA*, M. Okabayashi, W.M. Solomon, *PPPL* – The resistive wall mode (RWM) in high beta DIII-D discharges remains stable over a wide range of plasma rotation profiles. Suppressing the m/n=2/1 neoclassical tearing mode with localized electron cyclotron current drive near the q=2 surface can extend the stable operating regime even below the previously reported rotation thresholds. The observed operating regime is consistent with improved calculations of kinetic effects on the linear RWM stability. Instability is, however, observed when the plasma is perturbed by externally applied n=1 fields or plasma generated MHD activity such as ELMs or fishbones. In the cases of a static n=1 error field, where the limit manifests itself by a loss of torque balance and a subsequent rotation collapse, the stability can be improved by increasing the applied torque or reducing the resonant component of the error field. In the case of plasma generated perturbations, fast magnetic feedback has been successfully used to improve stability.

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