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☐ Theory      ☒ Experiment

**Study of RWM Stabilization by Plasma Rotation Using Active MHD Spectroscopy,\*** H. Reimerdes, A.M. Garofalo, M.J. Lanctot, G.A. Navratil, *Columbia U.*; M.S. Chu, G.L. Jackson, R.J. La Haye, E.J. Strait, *GA*; Y. Liu, *Chalmers U.*; M. Okabayashi, *PPPL* – Active MHD spectroscopic measurements have been used to probe the stability of the  $n=1$  and  $n=2$  kink modes in various DIII-D scenarios. The response of the plasma to externally applied slowly rotating non-axisymmetric fields, measured with magnetic field sensors, yields damping rates and mode rotation frequencies. The measurements show the transition from an ideal MHD stable plasma to a weakly damped resistive wall mode (RWM) at the ideal MHD, no-wall stability limit. Active MHD spectroscopy also tests kinetic theory, which is thought to be responsible for the observed RWM stabilization by plasma rotation. In contrast to measurements of the rotation threshold, which is likely caused by a nonlinear interaction of residual error fields with the weakly damped RWM, the spectroscopic technique at sufficiently low amplitude can be directly compared to linear predictions.

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