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Physics of the Resistive Wall Mode and Feedback Stabilization in DIII-D[1] A.M. GAROFALO, J. BIALEK, G.A. NAVRATIL, H. REIMERDES, Columbia U., M.S. CHU, G.L. JACKSON, T.H. JENSEN, R.J. LA HAYE, M.J. SCHAFFER, J.T. SCOVILLE, E.J. STRAIT, A.D. TURNBULL, General Atomics, R.J. JAYAKUMAR, LLNL, L.C. JOHNSON, M. OKABAYASHI, PPPL — DIII-D experiments have shown that the n=1 kink-ballooning mode can be stabilized by a resistive wall and plasma rotation for all β values between the no-wall and ideal-wall limits. Understanding the stabilization mechanisms is crucial to the reactor-relevance of these results. We have investigated the dependence of RWM stability on several key parameters: plasma rotation, plasma-wall separation, Alfvén speed, β, feedback and error magnetic fields. Results are consistent with theory, but bring up new challenges in some cases. As expected, the critical plasma rotation for stabilization scales as the inverse Alfvén time, and active feedback can stabilize the RWM below the critical plasma rotation speed. RWM propagation with respect to the wall is not required for stabilization by plasma rotation, unlike what theory seemed to imply.

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