Evidence for the importance of trapped particle resonances for resistive wall mode stability in high beta tokamak plasmas

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Abstract. Active measurements of the plasma stability in the DIII-D tokamak reveal the importance of kinetic resonances for resistive wall mode (RWM) stability. The rotation dependence of the magnetic plasma response to externally applied quasi-static $n = 1$ magnetic fields clearly shows the signatures of an interaction between the RWM and the precession and bounce motions of trapped thermal ions, as predicted by a perturbative model of plasma stability including kinetic effects. The identification of the stabilization mechanism is an essential step towards quantitative predictions for the prospects of "passive" RWM stabilization, i.e. without the use of an "active" feedback system, in fusion-alpha heated plasmas.

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