Measurement of resistive wall mode stability in rotating high beta DIII-D plasmas

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Abstract. Toroidal plasma rotation in the order of a few percent of the Alfvén velocity can stabilize the resistive wall mode and extend the operating regime of tokamaks from the conventional, ideal magnetohydrodynamic (MHD) no-wall limit up to the ideal MHD ideal wall limit. The stabilizing effect has been measured in DIII-D passively by measuring the critical plasma rotation required for stability and actively by probing the plasma with externally applied resonant magnetic fields. The comparison of these measurements to predictions of rotational stabilization of the sound wave damping and of the kinetic damping model using the MARS-F code results in qualitative agreement, but also indicates the need for further refinements of the measurements and models.