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The role of kinetic dissipation in modifying RWM eigenfunctions[1]
JONATHAN MENARD, Princeton Plasma Physics Lab, YUEQIANG LIU, Culham Center for Fusion Energy — Kinetic resonances have been identified to play an important role in the stability of the resistive wall mode (RWM) in tokamaks. One approach to computing RWM stability is a "pertubative" approach in which the mode stability is computed assuming the ideal kink eigenfunction is not modified by kinetic damping. The so-called "self-consistent" approach includes the dissipation in the perturbed force balance and computation of the mode eigenfunction as embodied in the MARS-F and MARS-K codes. Initial MARS-F and MARS-K simulations for NSTX plasmas find that there can be substantial changes between the predicted fluid (non-kinetic) limit of the RWM eigenfunctions and the self-consistent eigenfunctions computed with full kinetic damping included. These changes can be most pronounced near the plasma edge where the dissipation can be large for NSTX plasmas. These comparisons and the possible implications for the perturbative and self-consistent approaches will be described.

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