Abstract Submitted
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Non-ideal contributions to the stability of low-torque ITER baseline discharges[1] J.M. HANSON, F. TURCO, G.A. NAVRATIL, Columbia U, N.C. LOGAN, PPPL, T.C. LUCE, IO, E.J. STRAIT, GA — DIII-D experiments and simulations provide new insights into disruption inducing tearing modes, showing how these correlate with increased plasma response to magnetic probing and stability calculations. The dependencies of the plasma response on normalized internal inductance ℓ_i and pressure β_N are qualitatively consistent with ideal MHD, although the measurements indicate weaker stability than the simulations predict. This result is unexpected in light of similar comparisons made previously in strongly rotating discharges, wherein ideal MHD predicted poorer stability than implied by the measurements, and better agreement was obtained with simulations including drift-kinetic modifications. Calculations of the classical $(m, n) = (2, 1)$ tearing index Δ' also exhibit sensitivities to β_N and ℓ_i consistent with the measured response. These results pose a challenge to low rotation reactor regimes like the ITER baseline, but also provide a foundation and sensing technique to anticipate and optimize stability.

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