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Comparison of Plasma Response Model Predictions to Measurements in DIII-D RMP H-mode Discharges[1] R.A. MOYER, J.H. YU, D.M. ORLOV, C. CHROBAK, UCSD, S. MORDIJCK, W&M, M.A. VAN ZEELAND, T.E. EVANS, M.R. WADE, GA, C.S. CHANG, PPPL, F. WAELBROECK, UT-Austin, J.D. CALLEN, U Wisc-Madison — Plasma response to resonant magnetic perturbations (RMPs) is important for predictive understanding of ELM suppression in ITER. Theoretical models predict that the RMP should only open islands on rational surfaces where the electron perpendicular velocity $\nu_{\perp e} \approx 0$ where $\nu_{\perp e}$ is the sum of the electron diamagnetic and $\vec{E} \times \vec{B}$ rotation. In the edge of low collisionality ITER-similar shape (ISS) ELMing H-modes, $\nu_{\perp e} \approx 0$ near the $q = 8/3$ rational surface when the RMP is applied. The RMP modifies both the diamagnetic and $\vec{E} \times \vec{B}$ velocities; when the RMP suppresses ELMs, the $\nu_{\perp e} \approx 0$ point in the ELM-suppressed final state is at the $q = 9/3$ surface. We investigate the correlation of $\nu_{\perp e} \approx 0$ with plasma and transport response at low and moderate collisionalities, and present the results of imaging of the plasma edge using beam emission, visible brehmsstrahlung, D_α, and total visible light.

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