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Comparison of Vacuum Model Predictions to Measurements in DIII-D RMP H-mode Discharges[1] D.M. ORLOV, R.A. MOYER, D. ELDON, University of California San Diego, T.E. EVANS, N.M. FERRARO, M.A. VAN ZEELAND, General Atomics, A. WINGEN, M.W. SHAFER, E.A. UNTERBERG, ORNL, B.A. GRIERSON, R. NAZIKIAN, PPPL — In this work we validate vacuum model predictions for the displacement of the separatrix due to applied resonant magnetic perturbations (RMPs) against experimental measurements. It is often assumed that plasma screening of RMP may be weak in the region of low rotation, high resistivity and high magnetic shear near the plasma separatrix and in the scrape-off layer. Imaging beam emission spectroscopy (BES) shows radial displacement of the plasma boundary in the R,Z plane for $n = 2$ and $n = 3$ RMP experiments. Comparison of the vacuum field line tracing code (TRIP3D-MAFOT) separatrix displacement calculations with the Thomson scattering and imaging BES measurements shows good agreement for $n = 3$ discharges. However, separatrix displacements at the outer midplane in $n = 2$ discharges is underestimated by the vacuum model, suggesting a non-resonant kink response that depends on the toroidal mode number. The vacuum code predictions of the homoclinic tangle formation are also found to be in good agreement with the SXR camera measurements in the vicinity of the divertor X-point and with passive imaging of CIII emission from the high-field-side of the plasma.

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