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[ ] Theory [X] Experiment

Imaging of Boundary Plasma Displacements During RMPs in DIII-D,* R.A. Moyer, D.M. Orlov, *UCSD*; T.E. Evans, N. Ferraro, J. King, T. Strait, C. Paz-Soldan, *GA*; A. Wingen, *ORNL;* R. Nazikian, B. Grierson, *PPPL;* L. Zeng, *UCLA* – Visible imaging is used to measure the boundary displacement due to n = 2 and n = 3 RMPs in H-mode plasmas in DIII-D. Displacements ~2 cm on the outer midplane are measured in LSN H-modes using active imaging of Doppler shifted deuterium beam emission with n = 2 RMPs rotating in the co-current direction [1] where the kink response is expected to be maximized. In contrast, displacements due to static n = 3 RMPs are ~ 4 mm in similar LSN H-modes, with no measurable change when the n = 3 RMP phase is "flipped" by 60° toroidally. Plasma shape is also found to have a strong effect on the plasma response: n = 3 RMPs in Double Null Divertor plasmas are ~2 mm, 10x smaller than the displacements in similar LSN plasmas, consistent with magnetics measurements. We will compare boundary displacements measured with active beam emission and passive C III imaging to separatrix manifold displacements and kink response in plasma response models.

[1] R.A. Moyer, et al., Nucl. Fusion **52** 123019 (2012)

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