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Category Number and Subject: 5.6.2 DIII-D Tokamak

☐ Theory ☒ Experiment

Effects of 3D Magnetic Perturbations on DIII-D Reconstructed Equilibria,* L.L. Lao, M.S. Chu, A. Collier, T.E. Evans, M.J. Schaffer, E.J. Strait, *GA*; Q. Ren, *ASIPP*; R. Srinivasan, *IPR*; Y. Liu, *DUT* – Non-axisymmetric perturbation magnetic fields are routinely applied in DIII-D experiments to study and control MHD modes. The effects of the perturbation fields on the background 2D equilibrium are studied using a set of recent DIII-D single- and double-null H-mode discharges with varying amount of I-coil perturbations. The reconstructed vertical positions of the plasma separatrix boundary at the DIII-D Thomson diagnostic viewing chord are compared against those estimated from the measured edge electron temperature profiles. For lower single-null and double-null plasmas, the reconstructed vertical boundary locations generally agree with those estimated from the edge temperature profiles within ~1 cm. For upper single-null plasmas, the differences in the Thomson boundary locations tend to be greater. The effects of the perturbation fields on the 2D reconstructed equilibria are also being analyzed using a set of 3D codes TRIP3D without and MARS-F and VMOM3D with plasma response. Details will be presented.

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