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Category Number and Subject: 5.6.2 DIII-D Tokamak

Theory Experiment

**Plasma Equilibrium Response to Slowly Rotating 3D
Magnetic Perturbations in DIII-D RMP Experiments,*** L.L. Lao,

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Srinivasan, *IPR*; Y.Q. Liu, *UKAEA* — Slowly rotating non-
axisymmetric magnetic perturbations have been routinely used in
DIII-D experiments to study the plasma response to the applied
perturbation fields. The slow changes in the perturbation amplitude
allow the use of the DIII-D edge Thomson scattering measurements
of electron temperature as an indicator to monitor the edge magnetic
surface response in H-mode discharges. Although the applied
perturbation fields are small, the edge magnetic surface responses can
be large. For perturbations with $n=1$, a perturbation of 0.1–0.3% of
the poloidal equilibrium magnetic field can result in a 2–4% change
in the edge magnetic surface topology. The effects of the 3D
perturbation fields on the equilibria with and without plasma response
are being modeled using the 3D linear MHD code MARS-F, the 3D
equilibrium codes VMEC and VMOM3D, and other MHD codes.
Initial results indicate that plasma responses are important. Results
will be presented.

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