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Theory Experiment

Application of the Ideal Perturbed Equilibrium Code to DIII-D Magnetic Diagnostic Upgrade Designs,* N.C. Logan, J.E. Menard, J.K. Park, *Princeton Plasma Physics Laboratory*; E.J. Strait, *General Atomics* – The Ideal Perturbed Equilibrium Code (IPEC) has been upgraded with advanced visualization tools and synthetic diagnostics to make its output directly comparable with DIII-D diagnostic measurements. Using the synthetic magnetic diagnostics, IPEC has been used to assist in the design of an advanced 3D magnetic field diagnostic currently being built as an upgrade to the DIII-D tokamak experiment. This poster outlines the application of IPEC modeling to the magnetic diagnostic design, highlighting the power and versatility of both the computational tools and proposed diagnostics. Of the many new measurements that will be possible with the magnetic diagnostic upgrade, special emphasis is given here to the ability to directly measure electromagnetic torques on the plasma. The magnetic diagnostic design will be able to simultaneously measure electromagnetic torque from non-axisymmetric fields with toroidal mode numbers 1, 2 and 3. This will open the door to many new possibilities in studying rotational braking effects that will be further supported by IPEC.

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