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3D Perturbed Equilibria and ELM Suppression in DIII-D and Implications for ITER[1] N.M. FERRARO, T.E. EVANS, General Atomics, R. NAZIKIAN, Princeton Plasma Physics Laboratory — Non-axisymmetric perturbed equilibria are calculated for a series of DIII-D discharges in which 3D magnetic perturbations were applied, with the goal of gaining insight into the mechanism of resonant magnetic perturbation edge localized mode (ELM) suppression by identifying features of the 3D equilibria that are correlated with ELM suppressed states. Perturbed equilibria are also calculated for several 15 MA ITER scenarios in order to evaluate the extent to which these suppression-correlated features are expected to be attainable with the proposed internal coils in ITER. The equilibria are calculated with the M3D-C1 code, which implements a linear two-fluid model that includes experimentally realistic values of resistivity, rotation, and diamagnetic effects. Finally, nonlinear calculations are carried out with M3D-C1 to investigate the direct interaction between low-n applied fields and moderate-n peeling-ballooning modes.

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