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Maximum Controllable Displacement: Experimental Results from NSTX, and Comparison with Theoretical Results and Other Tokamaks EGEMEN KOLEMEN, Princeton University, DAVID GATES, PPPL, PPPL TEAM — Optimization of the ITER PF design requires information on the limits to axisymmetric stability control performance, as well as the safe margins in operation experienced in present-day devices with configurations relevant to ITER. Maximum controllable displacement, ΔZ_{max}, the largest displacement for which the plasma is still controllable, was recently proposed as a performance metric for the power supplies of the vertical stabilization loop on ITER. ΔZ_{max} is obtained. Experiments, which turn off the vertical position control and then turn it back on after the plasma has moved a given distance, are performed in order to measure ΔZ_{max}. The experimental measurements of ΔZ_{max} for the NSTX under various conditions relevant to ITER are presented. Employing a linear magnetohydrodynamics model of the plasma, the theoretical ΔZ_{max} is obtained. The results are compared to similar measurements from other Tokamaks (DIII-D, C-Mod) to establish model accuracies and validate design predictions for ITER. This work was supported by DoE contract No. DE-AC02-76CH03073.

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