

Abstract Submitted
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Error field identification and correction in NSTX high beta-N plasmas¹ J.E. MENARD, D.A. GATES, C.A. LUDESCHER, D.M. MASTROVITO, Princeton Plasma Physics Lab, S.A. SABBAGH, A.C. SONTAG, Columbia University, NSTX RESEARCH TEAM — Toroidal rotation damping and mode locking near the plasma boundary has been identified as responsible for inducing plasma disruptions in some high-normalized-beta scenarios in NSTX. This edge rotation damping has previously been shown to be correlated with magnetic error fields from toroidal field coil motion induced by the ohmic solenoid. Several techniques have been utilized to attempt to reduce this error field including: “predictive” correction of the time-evolving estimated error field and active feedback control of the plasma response to the residual error field utilizing newly commissioned real-time mode identification and feedback control software. The best plasma performance is obtained when the two techniques are used in concert. Use of the long-time-average of the active-feedback-controlled correction current results in similar plasma performance as the unfiltered current. The measured plasma rotation damping is decreased by error field correction, thereby increasing passive RWM stabilization relative to plasmas without error field correction. Details of the error field identification and correction algorithms will be described.

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