Abstract Submitted
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Resonant Field Amplification and Resistive Wall Mode Stability in NSTX[1] S.A. SABBAGH, A.C. SONTAG, W. ZHU, J. BIALEK, Columbia U., R.E. BELL, M.G. BELL, D.A. GATES, B.P. LEBLANC, J.E. MENARD, PPPL, D.J. BATTAGLIA, U. of Wisconsin, NSTX RESEARCH TEAM — The resistive wall mode (RWM) is passively stabilized in NSTX by sufficient plasma flow at values of normalized beta exceeding 6: a factor of 1.5 above the ideal MHD no-wall beta limit. The RWM stability of wall-stabilized plasmas has been examined by active techniques. Using a set of six coils located at the device midplane, magnetic fields with toroidal mode number, n, up to three are used to slow plasma rotation below the RWM critical rotation frequency, and to examine the stable RWM response. Resonant field amplification (RFA) has been observed in plasmas exceeding the no-wall beta limit. Fixed frequency, n=1 external fields phased to propagate either with, or against the direction of plasma toroidal flow yield a different RFA response. RWM growth rate and rotation frequency are examined from these data using a single mode model. Neoclassical tearing modes have been triggered by RWMs when the applied field follows the plasma flow. Standing wave fields with n=3 have slowed plasma rotation, yielding growing n=1 RWMs that rotate in the direction of the plasma flow.

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