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Dependence of Resistive Wall Stabilization on Equilibrium Configuration in NSTX[1] F. PAOLETTI, S.A. SABBAGH, J. BIALEK, Columbia U, D. GATES, R. BELL, B. LEBLANC, S. KAYE, J. MANICKAM, J. MENARD, PPPL, A. GLASSER, LANL, A. TURNBULL, GA — The dependence of the NSTX high β operating window as a function of current peaking (parameterized by l_i) and total pressure peaking, $F_p \equiv P(0)/ < P >$, has been studied both experimentally and theoretically. Discharges within an operating window of $4.0 < \beta_N < 6.5$ have been produced in NSTX. Operation in excess of 25% above the computed no-wall β_N-limit for kink/ballooning modes has been achieved in lower single null plasmas with $l_i \simeq 0.73$ and pressure peaking factor $F_p \simeq 2.0$. Record values for both $\beta_N \geq 6.5$ and $\beta_N/l_i \geq 9.5$ with $I_p \simeq (0.8 \div 0.9)$ kA and $B_T \simeq 0.45$ kG were produced in H-mode NBI heated discharges. Plasmas in this range exhibit resistive wall modes, or faster growing ideal modes leading to β collapse. β_N-limits are reduced but their separation $\delta(\beta_N)$ is increased as l_i is reduced. β_N-limits increase and their separation increases as F_p is reduced due to enhanced coupling of the kink mode to the stabilizing passive structure. Global mode structures are computed for typical H-mode type plasmas ($F_p \simeq 2.1$) while in L-mode type plasmas ($F_p > 3.2$) the modes are more internally localized.
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[X] Prefer Oral Session
[ ] Prefer Poster Session

Special instructions: In the NSTX oral section

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