

Abstract Submitted
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Active Resistive Wall Mode Feedback with Expanded Sensors in NSTX¹ S.A. SABBAGH, J.M. BIALEK, Columbia University, R.E. BELL, D.A. GATES, B.P. LEBLANC, J.E. MENARD, PPPL, NSTX TEAM — The resistive wall mode (RWM) active stabilization system on NSTX is expanded to include sensors measuring radial and poloidal mode components both above and below the plasma midplane. Various combinations of these control sensors are used to determine the effect on feedback performance. Plasma rotation and profile variation is generated by non-resonant magnetic braking using an applied $n = 3$ field configuration. Variation of the relative difference between the measured $n = 1$ RWM phase and the applied control field phase demonstrates both positive and negative feedback. Poloidal deformation of the mode observed during feedback at low plasma rotation [1] is examined with feedback using sensors both above and below the device midplane. Amplitude modulation of the measured $n = 1$ RWM sensor signal, thought to be resonant field amplification, can appear in both radial and poloidal sensors below the computed ideal MHD no-wall beta limit as determined by DCON stability analysis. The frequency of this modulation decreases as the RWM becomes unstable.

[1] S.A. Sabbagh, R. Bell, J.E. Menard, et al., *Phys. Rev. Lett.* **97**, 045004 (2006).

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