

Abstract Submitted
for the DPP10 Meeting of
The American Physical Society

Transient Enhancement ('Spike-on-Tail') Observed on NBI Energetic Ion Spectra Using the E||B NPA on NSTX¹ S.S. MEDLEY, N.N. GORELENKOV, R.E. BELL, E.D. FREDRICKSON, S.P. GERHARDT, B.P. LEBLANC, M. PODESTA, A.L. ROQUEMORE, Princeton University, NSTX TEAM — An $\sim 4x$ increase in the E||B Neutral Particle Analyzer (NPA) charge exchange neutral flux localized at the Neutral Beam Injection (NBI) full energy is observed in the National Spherical Torus Experiment (NSTX). Termed the High-Energy Feature (HEF), it appears only at the NBI full energy, exhibits a growth time of $\sim 20 - 80$ ms, seldom develops a slowing down distribution and arises only in discharges where kink-type modes ($f < 10$ kHz) are absent, TAE activity ($f \sim 10-150$ kHz) is weak and CAE/GAE activity ($f \sim 400-1200$ kHz) is robust. The HEF is observed only in H-mode discharges with $P_b \geq 3$ MW and $v_{||}/v \sim 0.7 - 0.9$; i.e. only for passing ions. The HEF is suppressed by vessel conditioning using lithium deposition at ≥ 100 mg/shot. Coincident increases of $\sim 10-30$ % in neutron yield and total stored energy during the HEF are driven by plasma profile changes and not the HEF itself. Tentatively, the HEF appears to be caused by a form of CAE/GAE wave-particle resonant interaction.

¹Work supported by US-DOE contract DE-AC02-09CH11466.

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Date submitted: 12 Jul 2010

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