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Transient energetic charge exchange flux enhancement observed in NSTX neutral-beam-heated H-mode discharges[1] S.S. MEDLEY, G.J. KRAMER, R.E. BELL, E. BELOVA, E.D. FREDRICKSON, S.P. GERHARDT, B.P. LEBLANC, M. PODESTÁ, Y. REN, A.L. ROQUEMORE, PPPL, N.A. CROCKER, UCLA, NSTX TEAM — Large increases in the E||B Neutral Particle Analyzer (NPA) charge exchange neutral flux localized at the Neutral Beam Injection (NBI) full energy are observed in the National Spherical Torus Experiment (NSTX). Termed the High-Energy Feature (HEF), it appears only at the NBI full energy, exhibits growth times $\sim$ 20-80 ms, seldom develops a slowing down distribution and arises only in discharges where NTM modes (f $<$ 30 kHz) are absent, TAE activity (f $\sim$ 30-150 kHz) is weak and GAE/CAE activity (f $\sim$ 400-1200 kHz) is robust. The HEF occurs 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 appears to be caused by a GAE wave-particle interaction that modifies of the NB fast ion distribution, $f_i(E,v_{||}/v,r)$. This proposed mechanism was studied using the SPIRAL code that imports a TRANSP-calculated $f_i(E,v_{||}/v,r)$ distribution and evolves it under drive from GAE wave-particle resonances.

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