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Energy channeling from trapped to passing fast ions mediated by GAE/CAE activity in NSTX[1] S.S. MEDLEY, E. BELOVA, G. KRAMER, M. PODESTA, Princeton University, D. LIU, UC Irvine — In the National Spherical Torus Experiment, an increased charge exchange neutral flux localized at the neutral beam full injection energy is measured by the E||B Neutral Particle Analyzer. Termed the High-Energy Feature (HEF), it appears on the beam-injected energetic ion spectrum in discharges where NTM or kink 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 exhibits a growth time of t $\sim$ 20 - 80 ms and develops a slowing down distribution that continues to evolve over periods $>$ 100 ms. HEFs are observed only in H-mode discharges with NB power $P_b \geq 4$ MW and in the pitch range $v_{||}/v \sim 0.7$ – 0.9. The HEF appears to be caused by a CAE/GAE wave-particle interaction that modifies the fast ion distribution, $f_i(E,v_{||}/v,r)$. This mechanism was studied using the SPIRAL code that evolves an initial TRANSP-calculated $f_i(E,v_{||}/v,r)$ distribution in the presence of background plasma profiles under drive from wave-particle resonances with CAE/GAE Alfvén eigenmodes.

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