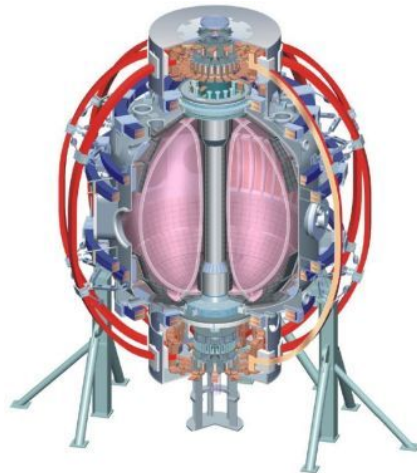


Investigation of an ‘Anomalous’ High-Energy Feature Observed on Energetic Ion Spectra in NSTX using the E||B Neutral Particle Analyzer

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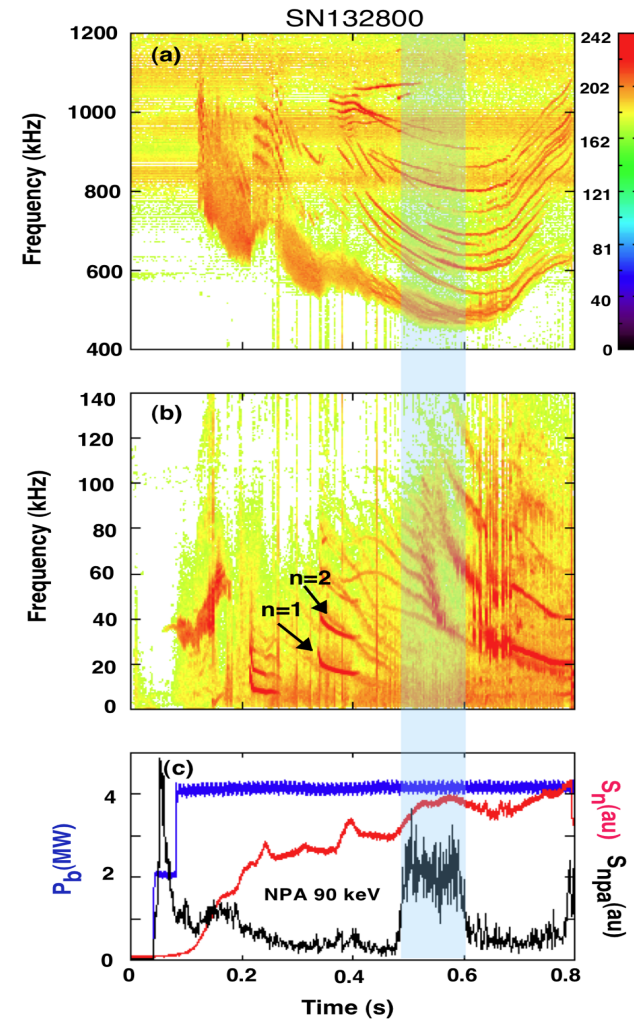
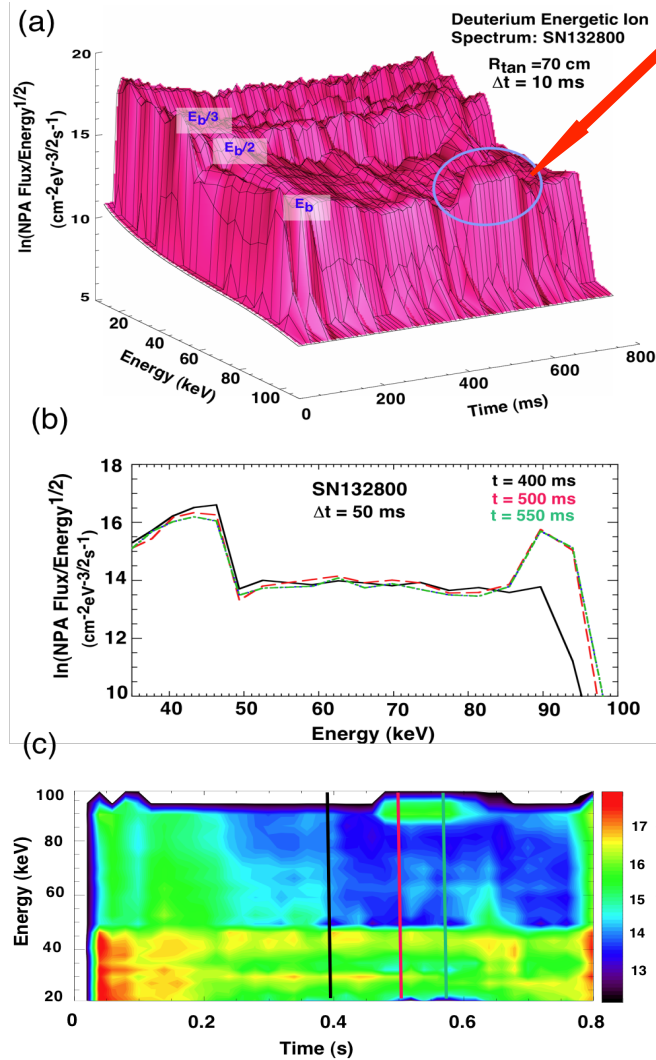
*Wave-Particle Interactions Topical Science Group
March 3, 2011*



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Illustration of a **High-Energy Feature (HEF)** at $t \sim 0.5\text{-}0.6$ s

HEF: a strong increase ($\sim 4\times$) in the EIB NPA flux localized around the NB full energy



• H-mode with $I_p = 1.1$ MA, $B_T = 4.5$ kG, A&C @ 90 keV, $P_{NB} = 4$ MW, $n_e L \sim 6 \times 10^{13}$ cm^{-2}

XP for Exploration of the High-Energy Feature (HEF)

Total ~ 37 Shots: Extended Run Day

- Does the HEF track E_b ?
 - E_b scan with ABC @ 100, 90, 80, 70 keV: (Fiducial + 3 shots)
- Does the HEF depend on NB sources?
 - Select E_b from above scan: run with AB, AC, BC (need $P_b > 4$ MW): (3 shots)
- Does the HEF occur with NB sources @ mixed E_b ?
 - For example, A @ 100 keV, B@ 90 keV, C@80 keV : (3 shots)
- Does NB modulation affect HEF behavior?
 - AB + C blips, AC + B blips, BC + A blips, 60 ms blips: (3 shots)
- Horizontal and vertical NPA scans with all NBs at a selected E_b
 - Hscan requires ~ 12 shots and Vscan ~ 8 shots: (20 shots)
- Does Lithium suppress HEFs?...use a robust scenario from above
 - LITER deposition @ 50, 100, 150, 200 mg/shot: (4 shots)

Note: except for the last case, Lithium-free or Lithium-passivated conditions are required.