

Abstract Submitted
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Spatially Resolved Measurements of NB Energetic Ion Distributions in NSTX SID MEDLEY, ROBERT ANDRE, LANE ROQUEMORE, Princeton U. — The mass and energy resolving superimposed E||B Neutral Particle Analyzer (NPA) on NSTX can be scanned over NPA sightline tangency radii from $R_{tan} = +125$ cm to $R_{tan} = -75$ cm on a shot-to-shot basis. This capability was used to measure the spatially resolved energy distribution Neutral Beam (NB) ions in both L-mode and H-mode discharges. In L-mode discharges, the NPA spectra exhibit classical slowing down and pitch angle scattering behavior in agreement with TRANSP code simulations. Also, the measured and TRANSP-calculated neutron emission rates are in good agreement. The same is true for H-mode discharges in which low $n = 1-3$, low frequency $f < 50$ kHz MHD tearing mode activity is absent. However, when MHD activity of this type is present in H-mode discharges, the NPA spectra exhibit a significant depletion of energetic ions that depends on time, energy and spatial location. Concurrently, the TRANSP-calculated neutron emission rate generally exceeds measurements by $\sim 10-20\%$. TRANSP analysis of these observations using a model for anomalous energetic ion diffusion as a function of energy, space and time will be presented. **Supported by U. S. DOE Contract DE-AC02-76CH03073*

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