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Electron Temperature and Density Fluctuations in Neutral Beam Heated Plasmas[1] E. PARKE, D.J. DEN HARTOG, L. LIN, University of Wisconsin-Madison — Neutral beam injection on the MST RFP suppresses core-resonant tearing modes and excites higher-frequency energetic particle (EP) modes. The Thomson scattering diagnostic on MST is capable of high effective repetition rates for observation of electron dynamics on short time scales, with recent upgrades increasing the maximum frequency from 25 kHz to 50 kHz. With these new capabilities, we present the results of Thomson scattering measurements of EP modes and tearing modes. We compare measurements of electron density fluctuations during an EP mode burst to interferometric measurements, which both show core-localization of the fluctuations. Temperature fluctuations correlated with the EP modes further constrain the mode structure. Measurements correlated with tearing modes show $\sim$50% reduction in temperature fluctuation amplitude during NBI, similar to the reduction in mode magnetic field amplitude at the wall. From the fluctuation structure, we infer the island stability factor and compare to theoretical predictions. The fluctuation structure and phase also allow measurement of the Shafranov shift and improved constraints on the equilibrium q-profile.

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