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High resolution MHD mode structure measurements via multi-channel reflectometery in NSTX[1] N.A. CROCKER, W.A. PEEBLES, S. KUBOTA, UCLA, E.D. FREDRICKSON, PPPL — MHD activity [e.g. Alfvén eigenmodes (AE) and tearing modes] plays a critical role in many aspects of plasma performance. AEs, for instance, can significantly impact fast-ion transport in neutral beam heated plasmas. The investigation of MHD activity in NSTX has been aided by an array of fixed-frequency quadrature reflectometers used to determine the radial density perturbation structure of a variety of modes. Recently, the array was upgraded from 5 to 16 channels. The maximum frequency, which was 50 GHz, was also increased, so it now spans 30 – 75 GHz (n_{cutoff} = 1.1 – 7.0 x 10^{19} m^{-3} in O-mode). The upgrade improves radial resolution in structure measurements, while also allowing access to higher density plasmas, including, in particular, H-mode plasmas. Structure measurements highlighting these capabilities are illustrated for a variety of MHD modes, including tearing modes, energetic particle modes and internal kinks (f∼1 – 25 kHz), reverse shear and toroidicity-induced AEs (f∼50 – 200 kHz) and compressional and global AEs (f∼0.5 – 2.5 MHz).

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