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Observation of the Enhanced High-k Spectra during H-mode Phase on NSTX.¹ H.K. PARK, D.R. SMITH, E. MAZ-ZUCATO, M. BELL, R. BELL, B. LEBLANC, S. KAYE, PPPL, R. MAINGI, ORNL, C.W. DOMIER, N.C. LUHMANN, JR., UCD — A multi-channel collective scattering system was commissioned on NSTX to investigate the anomalous electron transport physics. A high power microwave source (~ 100 mW) at ~ 1 mm wavelength was employed as the probe beam. The system consists of 5 discrete channels which primarily measure five radial wave-numbers up to $k_r \sim 20$ cm⁻¹ which corresponds to $k_{\perp}\rho_e \sim 0.2$ and ~ 0.7 for the edge and core for the NSTX parameters, respectively. Initial tests were performed at the edge of the quiescent OH and NBI heated plasmas. In OH and L-mode plasmas, the variation of the scattered power spectra at each wave-number was monotonic. However, significant changes of the scattered power were observed during the L/H transition phase. Relative decrease of the scattered power spectra at lower wave-numbers is largely attributed to the refraction effect due the edge density gradient, but the increase of the power spectra at the high-k channels is under investigation. The details of the scattered spectra from two types of H-mode plasmas (double null and single null) and spatial dependence will be discussed with the relevant TRANSP calculations.

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