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14.24 Simultaneous High-k Scattering and Microwave Imaging Reflectometry on NSTX-U

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An 8-channel High-k Scattering system is under development for NSTX-U. The 693 GHz poloidal scattering system replaces a 5-channel 280 GHz toroidal scattering system to study high-k density fluctuations on NSTX-U. The far-infrared (FIR) probe beam launched from Bay G is aimed towards Bay L, where large aperture optics collect radiation at 8 simultaneous scattering angles ranging from 2 to 15°. This yields measurement of poloidal wavenumbers from 7 cm⁻¹ up to >40 cm⁻¹, while the translatable optics allow the scattering volume to be placed from r/a = 0.1 out to the pedestal region (r/a ~ 0.99). A microwave imaging reflectometry (MIR) system is also under development for NSTX-U, to monitor low-kθ (< 3 cm⁻¹) density fluctuations. The MIR system will co-exist with the High-k Scattering system on Bay L, using a polarizing beam splitter to reflect the MIR beam upwards to the MIR optics positioned above that of the High-k Scattering system. Details of the 5×4 channel (5 poloidal, 4 radial) MIR system, spanning a frequency range of 51 to 75 GHz, will be presented together with that of the poloidal High-k Scattering system. *Work supported in part by U.S. DOE Grant DE-FG02-99ER54518 and DE-AC02-09CH1146.

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