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Upgrade for High-k Scattering on NSTX-U[1] ROBERT BARCHFELD, CHRIS MUSCATELLO, CALVIN DOMIER, NEVILLE LUHMANN, UC Davis, YANG REN, ROBERT KAITA, Princeton Plasma Physics Laboratory — A major upgrade to the high-k scattering system for NSTX-U is currently under development. This system measures electron-scale density fluctuations through collective scattering and will be comprised of four major components: 1) a 700 GHz FIR laser probe beam, 2) remote controlled, steerable launching optics on Bay G, 3) receiving optics on Bay L, 4) and a 4-channel receiver. An FIR laser is under construction to meet the needs of the high-k scattering system. A hybrid output coupler optimizes FIR power, while blocking IR pump wavelengths. Corrugated waveguide will deliver the probe beam to NSTX-U with minimal attenuation. At the launching port, remote controlled optics will focus and steer the beam ±3 degrees toroidally and poloidally. With the FIR laser fully characterized, the receiver system can be designed and fabricated including quasi-optical subharmonic mixers.

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