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Multi-point multi-pulse Thomson scattering diagnostic on the MST[1] HILLARY CUMMINGS, JOSHUA REUSCH, ROB O'CONNELL, DANIEL DEN HARTOG, University of Wisconsin Madison — The new Thomson scattering diagnostic on MST is now in regular operation. The system is based on two 2.5 J Nd:YAG lasers, each of which can be fired once per plasma with an energy of 2.5 J or every 20 ms with an energy of 1 J. Thomson-scattered light is detected with 20 four-channel General Atomics polychromators with avalanche photodiode modules (APD). Position calibration of the detection system is performed with a miniature integrating sphere mounted on a stepper-actuated probe inserted into MST. This integrating sphere allows in situ spectral and transmission calibrations when fiber-optically coupled with a wavelength-tunable laser. The gain and noise levels of the individual APDs are found using an LED that can be run in either a 50 Hz pulsed mode to simulate a laser pulse or in a DC mode to simulate background radiation. The gain and noise of the system has been measured to be highly dependent on the temperature of the detectors. Because of this, the APDs are water-cooled, and their temperatures are individually monitored. Remaining sources of system noise are either being mitigated or taken into account in calculation of the temperature measurement uncertainty.

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