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**High frequency electron temperature fluctuation measurements with the multi-point, multi-pulse Thomson scattering diagnostic on MST**[1]
HILLARY CUMMINGS, DANIEL DEN HARTOG, ROB O'CONNELL, JOSHUA REUSCH, University of Wisconsin - Madison — MST plasmas are rich in physics that can cause rapid changes in the electron temperature profile such as rotation of magnetic modes, reconnection events and electron turbulence. We present first results of electron temperature fluctuation measurements of about 5kHz and faster including temperature profile changes correlated with the quasi-single helicity state. The Thomson scattering diagnostic on MST consists of two independently triggerable Nd:YAG lasers and 15 four-channel and 6 eight-channel General Atomics polychromators equipped with avalanche photodiode modules. The two lasers can be fired arbitrarily close together in time and each can fire every 20 ms. Data acquisition becomes the limiting factor in time resolution. Overall the system is capable of measuring changes in the radial electron temperature profile on the order of 200 ns with a spatial resolution of 2 cm or less. It is also possible, on these fast timescales, to resolve non-Maxwellian electron distribution functions with the eight-channel polychromators.

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