

Status of the new multipoint, multipulse Thomson scattering diagnostic for the MST RFP (abstract)^{a)}

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We are building a new Thomson scattering diagnostic system to measure electron temperature and density on the Madison Symmetric Torus (MST) reversed-field pinch experiment. This system has been designed to produce accurate single-shot measurements for $10 \text{ eV} < T_e < 2 \text{ keV}$ at electron densities $\geq 10^{18} \text{ m}^{-3}$. Scattered light will be simultaneously recorded from 20 radial locations across the 50 cm minor radius of the plasma. Multipulse capability will be provided by two identical Nd:YAG pulsed lasers whose trigger timing can be independently varied. This will allow several combinations of input energy and pulse timing during an MST discharge, ranging from one 4 J pulse for increased accuracy during low density operation to 1 J pulses at 100 Hz for temporal evolution measurements. Scattered light will be collected by a custom deep-focus lens and coupled by optical fiber to 20 identical filter polychromators. These polychromators are being manufactured by General Atomics and use silicon avalanche photodiode detectors. Each polychromator contains three wavelength channels to allow determination of T_e , plus one channel at the laser wavelength to allow calibration using Rayleigh scattering for measurement of n_e . System control and data acquisition will be done with dedicated personal computers. © 2001 American Institute of Physics. [DOI: 10.1063/1.1326015]

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