Abstract Submitted
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High-Repetition-Rate Laser for Thomson Scattering on the MST Reversed-Field Pinch[1] WILLIAM C. YOUNG, L.A. MORTON, E. PARKE, University of Wisconsin-Madison, D.J. DEN HARTOG, University of Wisconsin-Madison, CMSO, MST TEAM — The MST Thomson scattering diagnostic has operated with a new, high-repetition-rate laser system, demonstrating 2 J pulses at repetition rates up to 50 kHz. The pulse repetition rate can maintain 2 J pulses for bursts of 5 kHz (sustained for 5 ms), to 50 kHz (for 10 bursts of 240 μs each). The 1064 nm laser currently employs a q-switched, diode pumped Nd:YVO_4 master oscillator, four Nd:YAG amplifier stages, and a Nd:glass amplifier. The future implementation of the full laser as designed, including a second Nd:glass amplifier, is expected to produce bursts of 2 J pulses at a repetition rate of at least 250 kHz. The new laser integrates with the same collection optics and detectors as used by the present MST Thomson scattering system: 21 spatial points across the MST minor radius with sensitivity over a 10 eV - 5 keV range. Initial results will be presented from application of this diagnostic to parametric scans of MST plasmas, evolution of energy confinement during spontaneous enhanced confinement periods, and non-Maxwellian electron distributions.

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