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Advances in the pulse-burst laser system for high-repetition-rate Thomson scattering on MST W.S. HARRIS, N.C. HURST, Department of Physics, UW-Madison, D.J. DEN HARTOG, CMSO, UW-Madison, J.R. AMBUEL, D.J. HOLLY, P.E. ROBL, Physical Sciences Laboratory, UW-Madison — A pulse-burst laser has been installed for Thomson scattering measurements on MST. The laser design is a master-oscillator power-amplifier which is capable of Q-switching at frequencies between 5-250 kHz. Single pulses through the first (four) Nd:YAG amplifier stages give energies up to 1.5 J, and the gain for each stage has been measured. Repetitive pulsing at 10 kHz has also been performed for 2 ms bursts giving average pulse energies of 0.53 J with $\Delta E/E$ of 4.6%, where ΔE is the standard deviation between pulses. The final Nd:glass amplifier stages require flashlamps operated at 1800 V and 1800 A. At these currents, inductive turnoff spikes can become large even for small circuit inductances. The flashlamp power supplies have been modified to reduce inductance and increase snubber capacitance, and now reliably produce pulse trains (10 pulses at 1 kHz) at maximum flashlamp drive current. In addition, the beam path is being extended to the MST vacuum vessel. This work is supported by the U. S. Department of Energy and the National Science Foundation.

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