

Abstract Submitted
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A Flexible Master Oscillator for a Thomson Scattering Pulse-Burst Laser System¹ D.J. DEN HARTOG, W.C. YOUNG, University of Wisconsin-Madison — A new master oscillator will be installed in the pulse-burst laser system used for high-rep-rate Thomson scattering on the MST experiment. This new master oscillator will enable pulse repetition rates up to 1 MHz, with the ability to program a burst of pulses with arbitrary and varying time separation between each pulse. In addition, the energy of each master oscillator pulse can be adjusted to compensate for gain variations in the power amplifier section of the laser system. This flexibility is accomplished by chopping a CW laser source with a high-bandwidth acousto-optic modulator (AOM). The laser source is a 1064 nm diode-pumped solid-state laser with continuous output power variable from 100 to 500 mW. The 2 mm diameter polarized beam is focused into the gallium phosphide crystal of the AOM, which deflects the beam by approximately 60 mrad. Beam deflection is controlled by a simple digital input pulse, and is capable of producing laser pulses of less than 20 ns width at repetition rates much greater than 1 MHz. These pulses from the output of the AOM will be collimated and propagated into the laser amplifier system, where they will be amplified to ~ 2 J/pulse and injected into the MST plasma.

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