Abstract Submitted
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Initial results from 2 kHz Thomson scattering measurements on MST[1] Y.M. YANG, B.E. CHAPMAN, D.J. DEN HARTOG, E. PARKE, J.A. REUSCH, H.D. STEPHENS, Department of Physics, University of Wisconsin-Madison — The laser system for the Thomson scattering diagnostic on the MST RFP has been upgraded to a pulse-burst system enabling operation at a 2 kHz repetition rate. Single-shot evolution of the electron temperature (Te) profile can now be recorded. This capability is especially useful for analysis of plasmas with shot-to-shot variation, such as those with Enhanced Confinement (EC) or Pulsed Poloidal Current Drive (PPCD). In discharges with PPCD at toroidal plasma current (0.5 MA), the central Te increases by $\sim$1500 eV in 10 ms, reaching a maximum $>$ 2000 eV. Simultaneously, Te closer to the plasma boundary remains at a few hundred eV. For reasons not yet understood, the time evolution of the Te profile and maximum central Te can vary substantially shot to shot. A global transport analysis for 0.4 MA standard, non-reversed, EC, and PPCD plasmas will also be presented. The energy confinement time during EC and PPCD plasmas is calculated for specific shots and shows a factor 2-3 improvement during EC and $\sim$6 during PPCD, relative to standard discharges.

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