Energy Confinement for Low Recycling Wall Conditions in the Lithium Tokamak Experiment$^1$ C.M. JACOBSON, D.P. BOYLE, E.M. GRANSTEDT, R. KAITA, M. LUCIA, B.P. LEBLANC, R. MAJESKI, J.C. SCHMITT, PPPL, S. KUBOTA, UCLA — The Lithium Tokamak Experiment (LTX) is a spherical tokamak designed to study the low-recycling regime through the use of lithium-coated shells conformal to the LCFS. A lowered recycling rate is expected to flatten core $T_e$ profiles, raise edge $T_e$, strongly affect $n_e$ profiles, and enhance confinement. A Thomson scattering diagnostic uses a 20 J, 36 ns FWHM pulsed ruby laser to measure $T_e$ and $n_e$ at 11 radial points on the horizontal mid-plane, spaced from the magnetic axis to the outer edge at a single temporal point for each discharge. Scattered light is imaged through a spectrometer onto an intensified CCD. The diagnostic is absolutely calibrated using a precision light source and Raman scattering. Measurements of $n_e$ are compared with line integrated density measurements from a microwave interferometer. The system can make measurements at $n_e \geq 2 \times 10^{18} \text{m}^{-3}$. $W_{\text{kin}}$ is calculated from $T_e$ and $n_e$ profiles with CHERS measurements to constrain $T_i$. $W_{\text{tot}}$ is measured using a compensated diamagnetic loop. These measurements and a magnetic equilibrium allow determination of $\tau_E$, which is compared to scaling law predictions under various wall conditions. Dependence of $T_e$ profile shapes on wall conditions is also discussed.

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