Abstract Submitted
for the DPP13 Meeting of
The American Physical Society

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 midplane, 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 $n_e \geq 2 \times 10^{18}\,\mathrm{m}^{-3}$. W_{kin} is calculated from T_e and n_e profiles with CHERS measurements to constrain T_i. W_{tot} is measured using a compensated diamagnetic loop. These measurements and a magnetic equilibrium allow determination of τ_E, which is compared to scaling law predictions under various wall conditions. Dependence of T_e profile shapes on wall conditions is also discussed.

[1]Supported by US DOE contract #DE-AC02-09CH11466.

C. M. Jacobson
PPPL

Date submitted: 12 Jul 2013 Electronic form version 1.4