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Operation of Magnetic Diagnostics on the Lithium Tokamak eXperiment[1] L. BERZAK, R. KAITA, T. KOZUB, R. MAJESKI, J. MENARD, L. ZAKHAROV, PPPL — The Lithium Tokamak eXperiment (LTX) is designed to investigate the novel, low-recycling lithium wall operating regime for magnetically confined plasmas. LTX reaches this regime through a heated shell coated with liquid lithium internal to the vacuum vessel. This shell provides an area of 5 m^2 of liquid lithium, more than 90% coverage of plasma facing components. An extensive array of unique magnetic diagnostics has been developed to yield detailed magnetic information in the presence of the shell and allow highly-constrained reconstructions of the plasma equilibrium. CDX-U, with a 2000 cm^2 liquid lithium limiter, observed a 5-10 fold increase in energy confinement time from pre-Li discharges with Ohmic loop voltages of only 0.4-0.5 V. The expanded magnetic diagnostics set is designed to permit more accurate evaluation of the global energy confinement time and surface loop voltage for comparison with the results of CDX-U and to perform scaling experiments in order to elucidate the variation in confinement with toroidal field, plasma current, and plasma density.

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