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FMCW Reflectometry for Electron Density Measurements on LTX[1] S. KUBOTA, X.V. NGUYEN, W.A. PEEBLES, UCLA, R. MAJESKI, R. KAITA, PPPL — An FMCW (frequency-modulated continuous-wave) reflectometer is being developed and installed on the Lithium Tokamak Experiment (LTX). The initial system will have two channels covering 13.5–33 GHz for (O-mode) electron density measurements in the range of $0.2-1.3\times10^{13}$ cm^{-3}. The reflectometer is designed to provide electron density profile measurements for fueling studies using the molecular cluster injector (MCI), the supersonic gas injector (SGI), as well as external gas puffing. The ultrafast time resolution ≥ 4 μs allows tracking of both the fast evolution of the density profile as well as fluctuations. A future third channel will extend the frequency range to 53 GHz for coverage up to 3.5×10^{13} cm^{-3}. The system design, along with simulations using ray tracing and 2-D full-wave codes showing the measurement capabilities and data as available, will be presented.

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