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Estimates of the Electron Density Profile on LTX Using FMCW Reflectometry and mm-Wave Interferometry[1] W.A. PEEBLES, S. KUBOTA, X.V. NGUYEN, UCLA, T. HOLOMAN, R. KAITA, T. KOZUB, D. LABRIE, J.C. SCHMITT, R. MAJESKI, PPPL — An FMCW (frequency-modulated continuous-wave) reflectometer has been installed on the Lithium Tokamak Experiment (LTX) for electron density profile and fluctuation measurements. This diagnostic consists of two channels using bistatic antennas with a combined frequency coverage of 13.5−33 GHz, which corresponds to electron density measurements in the range of $0.2-1.3\times10^{13}$ cm^{-3} (in O-mode). Initial measurements will utilize O-mode polarization, which will require modeling of the plasma edge. Reflections from the center stack (delayometry above the peak cutoff frequency), as well as line density measurements from a 296 GHz interferometer (single-chord, radial midplane), will provide constraints for the profile reconstruction/estimate. Typical chord-averaged line densities on LTX range from $2-6\times10^{12}$ cm^{-3}, which correspond to peak densities of $0.6-1.8\times10^{13}$ cm^{-3} assuming a parabolic shape. If available, EFIT/LRDFIT results will provide additional constraints, as well as the possibility of utilizing data from measurements with X-mode or dual-mode (simultaneous O- and X-mode) polarization.

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