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Initial Measurements of Electron Density Fluctations on LTX-β Using Microwave/Millimeter-Wave Diagnostics[1] S. KUBOTA, UCLA, R. MAJESKI, D.P. BOYLE, P.E. HUGHES, R. KAITA, PPPL, R. LANTSOV, W.A. PEEBLES, T.L. RHODES, UCLA, C. HANSEN, U. Washington — The mechanisms for fluctuation suppression due to low-recycling lithium walls and their impact on the confinement properties of the LTX-β device are key research topics for exploring the potential of lithium as a surface coating for plasma facing components in future fusion devices. UCLA operates a suite of microwave/millimeter-wave diagnostics for electron density profile and fluctuation measurements on LTX-β. Upgrades to existing systems will increase the sensitivity of the 288 GHz interferometer and the repetition rate of the 13.5−33 GHz profile reflectometers (sweep time down to 4 μs). Measurements from both diagnostics will be presented, as well as first results from the new two-channel tunable-frequency quadrature reflectometer (13.5−20.5 and 27−40 GHz individually), specifically designed for measuring low-k electron density fluctuations over a wide spectral bandwidth (up to 5 MHz). Quantitative results from the fluctuation measurements (e.g. spatial localization, amplitude, wavenumber spectra) will require synthetic diagnostics and analysis tools. This will include modeling far-forward scattering of the interferometer beam as well as backscattering from the profile reflectometers. Discussion of these tools will also be presented.

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