Abstract Submitted
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Simulation of the Microwave/Millimer-Wave Diagnostics on LTX-β for Density Fluctuation Measurements[1] S. KUBOTA, T.L. RHODES, W.A. PEEBLES, UCLA, R. MAJESKI, R. KAITA, PPPL — Fluctuation measurements and their relation to transport will be of key interest in the LTX-β device, which will have higher B_T and I_P, and neutral beam heating. UCLA plans to provide a suite of microwave/millimeter-wave diagnostics to measure internal electron density fluctuations: a 296 GHz single-chord interferometer, an FM-CW (frequency-modulated continuous-wave) reflectometer (13.5−33 GHz), and two tunable fixed-frequency quadrature reflectometer channels (13.5−20.5 and 27−40) GHz. Key to the interpretation of the experimental data will be extensive modeling of the target fluctuations and simulations of the reflectometry/scattering response. To this end a set of simulation tools has been developed to calculate the effects of density fluctuations on the measured signals: 3-D geometrical and physical optics, as well as 1-D and 2-D full-wave codes. The sensitivity of these diagnostics to various density profile shapes and turbulence models will be presented. Possible configurations for future microwave diagnostics on LTX-β, such as a Doppler backscattering, will also be explored.

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