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[ ] Theory [X] Experiment

Synthetic Image Correction of Microwave Imaging Reflectometer Signals,* C.M. Muscatello, N.C. Luhmann, Jr., *U. California-Davis*; G.J. Kramer, R. Nazikian, B.J. Tobias, *PPPL* – A microwave imaging reflectometer (MIR), capable of simultaneously measuring the poloidal and radial structure of density fluctuations, is operational on DIII-D. MIR probes the plasma at 4 simultaneous frequencies, generating a poloidal array of fluctuation measurements at 4 different radial locations. When probing the pedestal in the steep gradient region, the active cutoffs are closely spaced and MIR performs well as an imaging system. However, in the lower gradient regions of the core, the active cutoffs are often spaced farther apart than the optical depth-of-field, thereby inhibiting simultaneous imaging over multiple radial locations. A numerical procedure is implemented that propagates the electric field at the cutoff layer to the location of the optical focus. The procedure relies on symmetric detection of sidebands of the scattered field. This synthetic correction is applied to MIR data during Alfvén eigenmode activity to demonstrate its ability to resolve images at multiple core-localized locations as well as to demonstrate its limitations.

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