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Theory Experiment

Measurement of Tearing Mode Structure and Evolution Through Fluctuation Analysis of the Motional Stark Effect Diagnostic,* J.D. King, M.A. Makowski, C.T. Holcomb, S.L. Allen, D.N. Hill, W.H. Meyer, R. Geer, *LLNL*; M.A. Van Zeeland, *GA*; T.L. Rhodes, *UCLA*; E.C. Morse, *UC Berkeley* – Fluctuation analysis of the motional Stark effect (MSE) diagnostic allows for the direct internal measurement of \tilde{B}_z . Coherent fluctuations from internal tearing modes are easily observed on several MSE channels. At the heart of this measurement is the accurate recovery of MHD sidebands at 2nd harmonic photoelastic modulator (PEM) frequencies plus/minus the MHD toroidal mode frequency of rotation. Single value decomposition (SVD) filtering and analysis has been applied for adjacent MSE channels improving signal-to-noise and enabling successful recovery of sidebands. A sample temporal and spatially resolved \tilde{B}_z measurement of a 2/1 tearing mode is presented.

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