

Abstract Submitted
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Determining the Spatial Coherence of Modes in a Linear Plasma Using Filterscopes¹ H. RAY, T.M. BIEWER, D. FEHLING, E.A. UNTERBERG, Oak Ridge National Lab, G.N. LUO, Chinese Academy of Sciences — Oak Ridge National Laboratory's (ORNL) prototype Material Plasma Exposure eXperiment (Proto-MPEX) is a linear plasma device dedicated to the understanding of plasma material interaction (PMI) physics. A photo multiplier tube (PMT) based diagnostic system called a filterscope examines the visible light emission from Proto-MPEX in the radial (r) and axial (z) directions. Each of the filterscope's twelve PMTs has a calibrated D filter for plasma edge and target region analysis. Fiber optics located at various r- and z-positions along Proto-MPEX will transmit the brightness of the plasma as a function of time to the filterscope. Analysis of the data will include performing a Fast Fourier Transform (FFT) to determine the dominant modes in the spectral emission and characterizes these modes in relation to the facilities operating parameters. Pairs of measurements are also analyzed to determine the spatial coherence of the signals, which include phase shifts and relative differences, in order to determine mode localization.

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