

Abstract Submitted
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2D Measurements of the Balmer Series in Proto-MPEX using a Fast Visible Camera Setup¹ ELIZABETH G. LINDQUIST, Hope College, THEODORE M. BIEWER, Oak Ridge National Laboratory, HOLLY B. RAY, University of Tennessee — The Prototype Material Plasma Exposure eXperiment (Proto-MPEX) is a linear plasma device with densities up to 10^{20} m^{-3} and temperatures up to 20 eV. Broadband spectral measurements show the visible emission spectra are solely due to the Balmer lines of deuterium. Monochromatic and RGB color Sanstreak SC1 Edgertronic fast visible cameras capture high speed video of plasmas in Proto-MPEX. The color camera is equipped with a long pass 450 nm filter and an internal Bayer filter to view the D_α line at 656 nm on the red channel and the D_β line at 486 nm on the blue channel. The monochromatic camera has a 434 nm narrow bandpass filter to view the D_γ intensity. In the setup, a 50/50 beam splitter is used so both cameras image the same region of the plasma discharge. Camera images were aligned to each other by viewing a grid ensuring ~ 1 pixel registration between the two cameras. A uniform intensity calibrated white light source was used to perform a pixel-to-pixel relative and an absolute intensity calibration for both cameras. Python scripts that combined the dual camera data, rendering the D_α , D_β , and D_γ intensity ratios. Observations from Proto-MPEX discharges will be presented.

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Elizabeth Lindquist
Hope College, Oak Ridge National Laboratory

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