Abstract Submitted
for the DPP15 Meeting of
The American Physical Society

Visible camera imaging of plasmas in Proto-MPEX[1] R. MOSBY, C. SKEEN, Oak Ridge High School, T.M. BIEWER, R. RENFRO, Oak Ridge National Lab., H. RAY, G.C. SHAW, Univ. of Tennessee, Knoxville — The prototype Material Plasma Exposure eXperiment (Proto-MPEX) is a linear plasma device being developed at Oak Ridge National Laboratory (ORNL). This machine plans to study plasma-material interaction (PMI) physics relevant to future fusion reactors. Measurements of plasma light emission will be made on Proto-MPEX using fast, visible framing cameras. The cameras utilize a global shutter, which allows a full frame image of the plasma to be captured and compared at multiple times during the plasma discharge. Typical exposure times are ∼10-100 microseconds. The cameras are capable of capturing images at up to 18,000 frames per second (fps). However, the frame rate is strongly dependent on the size of the "region of interest" that is sampled. The maximum ROI corresponds to the full detector area, of ∼1000x1000 pixels. The cameras have an internal gain, which controls the sensitivity of the 10-bit detector. The detector includes a Bayer filter, for "true-color" imaging of the plasma emission. This presentation will exmine the optimized camera settings for use on Proto-MPEX.

[1]This work was supported by the US. D.O.E. contract DE-AC05-00OR22725.

Theodore Biewer
Oak Ridge National Lab.

Date submitted: 23 Jul 2015 Electronic form version 1.4