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Preliminary results of Laser-based diagnostics for proto-MPEX[1]

G. SHAW, University of Tennessee, T.M. BIEWER, Oak Ridge National Laboratory, G.N. LUO, Institute of Plasma Physics, Chinese Academy of Sciences, Hefei, China, M. MARTIN, R. MARTIN, Oak Ridge National Laboratory, B. WIRTH, University of Tennessee — Oak Ridge National Laboratory (ORNL) Laboratory Directed Research and Development (LDRD) funding enabled the initial installation of laser based, Thomson Scattering (TS), Rayleigh Scattering (RS), and Laser Induced Breakdown Spectroscopy (LIBS) diagnostics on the prototype Material-Plasma Exposure eXperiment (proto-MPEX). TS measures the electron temperature and density while RS measures the neutral density. LIBS is performed by focusing laser radiation onto a target surface, ablating the surface, forming a plasma plume, and analyzing the plume to determine the surface matter composition. The design elements and preliminary measurements for the TS, RS, and LIBS will be discussed, along with considerations for further optimization.

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