

Abstract Submitted
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Development and Implementation of a New HELIOS Diagnostic using a Fast Piezoelectric Valve on the Prototype Material Plasma Exposure eXperiment¹ HOLLY RAY, Univ of Tennessee, Knoxville and Oak Ridge National Laboratory, THEODORE BIEWER, JUAN CANESES, Oak Ridge National Laboratory, JONATHAN GREEN, University of Wisconsin Madison, ELIZABETH LINDQUIST, Hope College, LEVON MCQUOWN, OLIVER SCHMITZ, University of Wisconsin Madison — A new helium line-ratio spectral monitoring (HELIOS) diagnostic, using a piezoelectric valve with high duty cycles (on/off times \sim ms), allowing for good background correction, and measured particle flowrates on the order of \sim 1020 particles/second is being implemented on Oak Ridge National Laboratory's (ORNL) Prototype Material Plasma Exposure eXperiment (Proto-MPEX). Built in collaboration with the University of Wisconsin – Madison, the HELIOS diagnostic communicates with a Labview program for controlled bursts of helium into the vessel. The open magnetic geometry of Proto-MPEX is ideal for testing and characterizing a HELIOS diagnostic. The circular cross-section with four ports allows for cross comparison between different diagnostics: 1) Helium injection with the piezoelectric puff valve, 2) HELIOS line-of-sight high-gain observation, 3) scan-able Double Langmuir probe, and 4) HELIOS 2D imaging observation. Electron density and temperature measurements from the various techniques will be compared.

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