

Abstract Submitted  
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**A MSE Polarimetry diagnostic for the measurement of radial electric fields on the HSX stellarator**<sup>1</sup> T. J. DOBBINS, S. T. A. KUMAR, F. S. B. ANDERSON, D. T. ANDERSON, UW-Madison — The radial electric field in HSX has been measured using the Charge Exchange Recombination Spectroscopy. These impurity ion flow measurements could not resolve a large positive radial electric field (40-50 kV/m) near the core of the HSX plasma, predicted by neoclassical codes. A dual PEM (Photo Elastic Modulator) MSE polarimetry system has been designed for direct measurement of the radial electric field in the HSX plasma. The polarimetry design has been optimized to get a maximum change in polarization angle from an electric field while still providing good spatial resolution. It is expected that a radial electric field as small as 7 kV/m can be detected. The initial results of the system on an available port will be presented. The choice and design of the optics for the optimal viewing port will also be presented.

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