

Abstract Submitted
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The design of a MSE polarimetry diagnostic for the measurement of radial electric fields on the HSX stellarator T. DOBBINS, S.T.A. KUMAR, D.T. ANDERSON, F.S.B. ANDERSON, UW-Madison — HSX is a quasi-symmetric stellarator that is designed to reduce neoclassical transport. Neoclassical codes estimate a large positive radial electric field (40-50 kV/m) near the core of the HSX plasma. Impurity ion flow measurements could not resolve this large electric field. A single channel, dual PEM (Photo Elastic Modulators) MSE polarimetry diagnostic has therefore been designed for the HSX stellarator to directly measure the radial electric field near the core of the plasma. The design has been optimized to get a maximum change in polarization angle from a radial electric field with a good spatial resolution. A change in radial electric field as small as 1.5 kV/m can be detected with a careful selection of the sightline. The diagnostic design and initial characterization are presented.

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