

Abstract Submitted
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An Alternative Optical System for the Motional Stark Effect Diagnostic¹ T. MILBOURNE, College of William and Mary, J. LIU, UC Berkeley, M. BITTER, A. DIALLO, P.C. EFTHIMION, R. MUMGAARD, F. LEVINTON, K.W. HILL, N. PABLANT, PPPL, S. SCOTT, MIT-PSFC — The presently used systems for Motional Stark Effect (MSE) diagnostics are complex and include many optical components which can degrade the signal intensity and polarization. We propose a new optical system for MSE measurements which uses only one spherical mirror to image the spectral lines. This alternative system offers the following advantages: (1) it consists of only one optical component; (2) by exploiting the astigmatism of a spherical mirror, it focuses the radiation emitted from an entire line segment, perpendicular to the direction of the neutral beam, onto a point on the detector and provides spatial resolution along the beam direction; (3) due to the symmetry of the system, the polarization of the spectral lines is essentially conserved; (4) only a thin slit at the meridional focus is required as a viewing port to the plasma, which will protect the detector from intense neutron and gamma radiation. Test results verifying the polarization-conserving properties for various angles of incidence will be presented.

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