

Abstract Submitted
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The Motional Stark Effect (MSE) Diagnostic on the National Spherical Torus Experiment (NSTX)¹ FRED LEVINTON, HOWARD YUH, Nova Photonics — A motional Stark effect(MSE) diagnostic for measurement of the magnetic field pitch angle has been installed on the National Spherical Torus Experiment (NSTX). The diagnostic system has a tangential view of a neutral beam, used for heating the plasma, providing good spatial resolution. The viewing optics covers from inboard of the magnetic axis to the outboard plasma edge. Presently 16 sightlines are instrumented and operating, with additional channels planned for the future. Due to the low magnetic field (~ 0.35 Tesla), several changes from typical MSE diagnostics were incorporated into the system. The optical system is configured using an aperture to reduce the geometric Doppler broadening from the heating beam and increase the polarization fraction. Another innovation was development of a birefringent Lyot filter with high throughput and high resolution. The filter has a bandwidth of 0.058 nm and transmission of $\sim 30\%$. The polarization fraction is measured to be $\sim 30\text{-}40\%$ which combined with the large etendue results in a time resolution of ~ 5 ms.

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