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Development of Polarization Rotator for the Motional Stark Effect with Laser-Induced Fluorescence Diagnostic J.E. ZELENTY, University of Chicago, E.L. FOLEY, Nova Photonics, Inc. — The motional Stark effect with laser-induced fluorescence (MSE-LIF) diagnostic is currently being installed on NSTX at PPPL. The MSE-LIF diagnostic will be responsible for measuring the magnetic field magnitude and pitch angle in the low magnetic field regime of NSTX. The method used for MSE-LIF is based on the observation of the laser-induced fluorescence of the Balmer-alpha transitions in hydrogen from a diagnostic neutral beam. As the neutral beam passes through the magnetic field, B , with a high velocity, v , the hydrogen atoms experience an electric field in their rest frame, $E = v \times B$. This electric field causes a splitting and polarization of the H-alpha emission. Using the polarization orientation of this emission, the magnetic field pitch angle can be determined. This orientation can be resolved by polarizing the laser light responsible for exciting the hydrogen atoms via a polarization rotator. In this investigation, a polarization rotator for the MSE-LIF laser is designed, built, and tested. The results will be presented and discussed.

Jennifer Zelenty
University of Chicago

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