

Abstract Submitted
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The Motional Stark Effect with Laser-Induced Fluorescence Diagnostic¹ E.L. FOLEY, F.M. LEVINTON, Nova Photonics, Inc. — The motional Stark effect with laser-induced fluorescence diagnostic (MSE-LIF) was installed on NSTX for demonstration in the 2011 run year. The MSE-LIF will enable radially resolved measurements of the magnetic field pitch angle and magnitude, both of which can be used to constrain plasma equilibrium reconstructions. A diagnostic neutral beam with low axial energy spread, low divergence, and high reliability has been developed. It operates routinely at 35 kV and 40 mA. A laser has been developed with high power (~ 10 W) and optimal linewidth match to the neutral beam (~ 6 GHz). The laser wavelength is near 651 nm for a match to the Doppler-shifted Balmer-alpha transition in the beam neutrals. The unique high-power, moderate linewidth laser system utilizes a 19 emitter diode laser bar and feedback from a volume holographic grating. A magnetic shield protects the ion source from the NSTX stray fields. Initial data in a gas-filled torus and low magnetic fields was taken on NSTX and is presented here.

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