

Abstract Submitted
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Progress on MSE-LIF diagnostic for NSTX-U¹ Y. SECHREST, F. M. LEVINTON, M. GALANTE, D. DICICCO, H. LA FLEUR, D. CYLINDER, H. YUH, Nova Photonics — The motional Stark effect with laser-induced fluorescence diagnostic (MSE-LIF) was installed on NSTX during 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 matched to the energy spread of 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 Bragg grating for line width narrowing. Progress on the development of the MSE-LIF diagnostic toward initial operation during NSTX-U plasma operations will be presented, and highlights from the first run year will be discussed.

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