

Abstract Submitted
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Motional Stark effect with laser-induced fluorescence diagnostic development JON C. HILLESHEIM, University of Wisconsin - Madison, ELIZABETH L. FOLEY, FRED M. LEVINTON, Nova Photonics Inc. — The motional Stark effect with laser-induced fluorescence (MSE-LIF) diagnostic is being developed to measure the magnetic field pitch angle and magnitude in a variety of plasma conditions; in particular, at low magnetic fields ($< 0.5\text{T}$). When passing through a magnetic field, the H-alpha emission from a neutral hydrogen beam is split and polarized by the linear Stark effect due to the $\mathbf{v} \times \mathbf{B}$ electric field. The pitch angle can be determined from the polarization and the magnitude from the line splitting. The energy spread of the neutral beam causes line broadening. The neutral beam source has been modified since its original construction in attempts to minimize the energy spread. The neutral beam source has been characterized. A plasma of $\sim 10^{12} \text{ cm}^{-3}$ density with a diameter over 10 cm is required to collect an observable MSE-LIF signal above $\sim .01\text{T}$. To that end, a spiral antenna helicon plasma source has been constructed and characterized. Results will be presented.

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