

Abstract Submitted  
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**LIF-MSE Diagnostics** PATRICK MALONEY, JILL FOLEY, FRED LEVINTON, Carleton College — The motional Stark effect (MSE) is a standard technique for measuring magnetic field pitch angle in plasma experiments. The pitch angle is found with a beam of neutral hydrogen atoms which when traveling through a magnetic field perceive a Lorentz electric field in their own frame. However, while MSE is extremely effective for fields  $> 1$  T, it can be difficult to resolve weaker fields as a consequence of line broadening from collection optics. To counter line broadening, a method using Laser Induced Fluorescence (LIF) to excite specific atomic transitions in the hydrogen beam has been proposed. The purpose of this project has been to implement a data acquisition and control system for the diagnostic neutral beam and Spiral Antenna Helicon High Intensity Background (SAHHIB) experiment, which is currently being developed as a plasma test bed for LIF-MSE. The resulting program logs a variety of measurements including those necessary for calculating the expected LIF-MSE signal. Should the MSE-LIF device on SAHIB prove successful, it will be employed at the National Spherical Torus experiment (NSTX).

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