

Abstract Submitted
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The Motional Stark Effect Diagnostic for ITER¹ E.L. FOLEY, F.M. LEVINTON, H.Y. YUH, Nova Photonics, Inc, L.E. ZAKHAROV, Princeton Plasma Physics Laboratory — The United States has been tasked with the development and implementation of a Motional Stark Effect (MSE) system on ITER. In the harsh ITER environment, MSE is particularly susceptible to degradation, as it depends on polarimetry, and the polarization reflection properties of surfaces are highly sensitive to thin film effects due to plasma deposition and erosion of a first mirror. Here we present the results of a comprehensive study considering a new MSE-based approach to internal plasma magnetic field measurements for ITER. The proposed method uses the Line Shifts in the MSE spectrum (MSE-LS) to provide a radial profile of the magnetic field magnitude. To determine the utility of MSE-LS for equilibrium reconstruction, studies were performed using the ESC-ERV code system. A near-term opportunity to test the use of MSE-LS for equilibrium reconstruction is being pursued in the implementation of MSE with Laser-Induced Fluorescence (MSE-LIF) on NSTX. Simulation results for ITER and NSTX will be presented, and the relative merits of the traditional line polarization approach and the new line shift approach will be discussed.

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