

Abstract Submitted
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Design and Status of the Motional Stark Effect Diagnostic for ITER¹ FRED LEVINTON, ELIZABETH FOLEY, HOWARD YUH, Nova Photonics — 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, in order to transmit light to a detector, a shielded labyrinth is required to mitigate the effect of neutrons and radiation. This necessitates the use of several mirrors to relay the light to the vacuum interface outside the shielded region. However, the plasma facing mirror is susceptible to coating and erosion. This is problematic for any optical diagnostic and particularly polarimetry measurements such as MSE. Even thin coatings can change the phase and reflectivity of s and p polarized light when reflected from a mirror. This makes maintaining and tracking the MSE calibration very challenging. Our proposed approach to the MSE diagnostic is to implement a combination of conventional MSE polarimetry and a new approach to measure the magnitude of the magnetic field from the line shift of the Stark spectrum. The advantage of the latter approach is that the line shifts are independent of polarization. Results of this and conceptual designs of the proposed MSE system for ITER will be discussed.

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