

Abstract Submitted  
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**Performance assessment of C-Mod MSE Upgrades**<sup>1</sup> S.D. SCOTT, PPPL, R.M. MUMGAARD, PSFC-MIT — Two upgrades for the Motional Stark Effect (MSE) diagnostic on Alcator C-Mod have been completed recently to address issues relating to partially polarized background light and drift of the system's calibration over time. The beam-induced MSE signal is contaminated by partially polarized background light generated when unpolarized visible Bremsstrahlung, glowing invessel structures, and quasi-continuum edge emission reflect off the ICRF antennas. The background light varies rapidly in time so the standard approach of interpolating background measurements as the beam is modulated in time does not yield sufficient accuracy. A prototype single-channel, three wavelength polychromator has been installed to measure the polarization properties of the background light in real time at a wavelength close to the MSE spectrum while simultaneously measuring the beam emission. In addition, an invessel calibration system has been installed to provide an MSE calibration with linearly polarized light at four angles within 8 seconds of a C-Mod plasma shot. The performance of these systems will be assessed over the C-Mod 2012 experimental run campaign. Potential application of these techniques to ITER and next step devices will be discussed.

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