

Abstract Submitted
for the DPP09 Meeting of
The American Physical Society

Thermal issues and relevant upgrades of the MSE diagnostic on Alcator C-Mod¹ JINSEOK KO, MIT PSFC, STEVE SCOTT, PPPL, SYUN'ICHI SHIRAIWA, BOB MUMGAARD, MIT PSFC, MARK SMITH, PPPL — The cause of shot-to-shot drifts in polarization angle measured by the Motional Stark Effect (MSE) diagnostic in Alcator C-Mod has been identified as thermal stress birefringence in the in-vessel optics. Based on a series of bench experiments that characterized the thermal response of the system, a single-layer heat shield with gold plating and a new lens holder which reduces the thermal conduction path to the lens have been designed, fabricated, and installed. These modifications are expected to reduce the temperature variation across the in-vessel lens to less than 0.5 Celsius degrees during C-Mod discharges with high power. The expected reduction in the spurious change in polarization angle is more than a factor of 10. New dielectric mirrors with reduced retardation are expected to reduce the drift by an additional factor of 2 to 4.

¹Work supported by the U.S. Department of Energy, Grant No. DE-FC02-99ER54512 and DE-AC02-09CH11466.

Jinseok Ko
MIT PSFC

Date submitted: 20 Jul 2009

Electronic form version 1.4