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Upgraded thermal management of the MSE diagnostic on Alcator C-Mod R. MUMGAARD, MIT Plasma Science and Fusion Center, S. SCOTT, Princeton Plasma Physics Laboratory, Princeton, NJ, USA, J. KO, S. SHIRAIWA, MIT Plasma Science and Fusion Center, Cambridge, MA, USA, M. SMITH, Princeton Plasma Physics Laboratory, Princeton, NJ, USA — A major upgrade to the Motional Stark Effect (MSE) diagnostic was completed in June 2009 to reduce spurious errors in polarization angle measurements arising from thermal stress birefringence in the in-vessel optics [Thermal issues and relevant upgrades of the MSE diagnostic on Alcator C-Mod, Ko]. The upgrade comprises a gold-plated thermal shield, a novel thermally-insulating mount mechanism for the in-vessel MSE lenses, and improved dielectric mirrors with low retardance. The thermal and polarimetric performance of these systems will be evaluated over the course of the FY09 Alcator C-Mod experimental campaign. We compare the actual effectiveness of the thermal shield as determined from 20 thermocouple measurements to predicted performance. Reductions in the spurious variation in polarization angle will be evaluated by measuring the pitch angle in identical plasma discharges widely separated in time. Additionally, the effect of retardation in the mirrors and photoelastic modulators on calibration errors will be discussed. Work supported by US DOE Contracts DE-AC02-09CH11466 and DE-FC02-99ER54512.

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