Abstract Submitted
for the DPP12 Meeting of
The American Physical Society

Design, Engineering, and Testing for the Alcator C-Mod Outer Divertor Upgrade[1] S. HARRISON, PPPL, R. VIEIRA, B. LIPSCHULTZ, MIT PSFC, R. ELLIS, D. KARNES, PPPL, J. DOODY, L. ZHOU, MIT PSFC, P. TITUS, H. ZHANG, PPPL, W. BECK, R. GRANETZ, MIT PSFC — Alcator C-mod's major outer divertor upgrade will enable significant advances in our understanding of reactor relevant physics and operations. Two primary features of the new outer divertor are its toroidally continuous design (electrical and mechanical), and ability to be operated up to or independently heated to 600 $^\circ$C. Full control of the divertor PFC temperature from ambient vessel temperature to 600 $^\circ$C, will enable new and important tokamak research into the temperature dependence of fuel retention, PFC deposition and erosion, and divertor recycling. Significant design, analysis, and testing is underway to complete this important and challenging upgrade, which will provide valuable information for ITER and future reactors. Among other aspects of the innovative approach, the divertor plate supports, halo current shunts, and thermal shield assemblies will be discussed. The divertor supports enable pure radial motion of the divertor ring as it expands thermally and robustness to massive disruption induced electro-mechanical loads. Halo current shunts conduct 400kA in an 8T magnetic field and allow for divertor displacement relative to the vessel. Thermal shielding significantly reduces radiation and conduction to surrounding vessel structures.

[1]Supported by USDoE awards DE-FC02-99ER54512 and DE-AC02-09CH11466.

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Date submitted: 10 Jul 2012 Electronic form version 1.4