

Abstract Submitted
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Design and analysis of divertor calorimetry in Alcator C-Mod¹

J. PAYNE, D. BRUNNER, B. LABOMBARD, J.L. TERRY, MIT PSFC — An array of 14 calorimeter sensors was recently installed in a set of specially-design “ramped” tiles in C-Mod’s outer divertor. Each sensor consists of a 5 mm diameter molybdenum body, thermally isolated from its host tile, with an embedded type-K thermocouple positioned 5 mm from the plasma-facing end. Optimization of the design was performed by mechanical modeling with SOLID EDGE combined with thermal analysis using the ALGOR package. The plasma-facing surface of the tiles and embedded calorimeters are ramped at 2 degrees in the toroidal direction to eliminate plasma shadowing effects and to improve signal-to-noise by enhancing the local heat flux. Temperature readings taken before and after a plasma discharge allow energy deposition profiles to be inferred. The entire array is viewed by an IR imaging system (ElectroPhysics Titanium 550M Camera), allowing a cross-check between these two diagnostics. This paper will report on the diagnostic design and thermal analysis with data from C-Mod discharges.

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