Abstract Submitted
for the DPP13 Meeting of
The American Physical Society

Modeling of the Thermal Footprint at the Strike Point and Fast Thermocouples in Carbon Tiles[1] R.E. NYGREN, J.G. WATKINS, D.A. BUCHENAUER, SNL, M.A. MAKOWSKI, LLNL, A.W. LEONARD, GA — Thermal broadening can complicate interpretation of IR images at the strike point because the peaked profile of surface temperature widens as the tile heats due to lateral conduction away from the peak, so the instantaneous values of λ_q extracted from IR images increases during the shot. Detailed 3D thermal analyses of divertor tiles complement data from edge probes, fast thermocouples (FTCs) and IR thermography and aids interpretation. But the surface temperature reflects the integrated heat load over time, so changes in power or movement of the plasma complicates this interpretation. The array of 16 embedded FTCs in DIII-D divertor tiles are 8 mm below the surface.The poster focuses on the degree to which the FTCs can help resolve the absolute value of the surface temperature and the extracted profile of surface temperature and related peaked heat load.We include a series of detailed 3D thermal analyses of one DIII-D tile exposed to a (theoretical) peaked heat load characterized by the commonly-used two-parameter fit [1].

[1] T. Eich, et al., Phys. Rev. Lett. **107**, 215001 (2011).

[1]Work supported by the US DOE under DE-AC04-94AL85000, DE-AC52-07N27344 & DE-FC02-04ER54698.

Tony Leonard
General Atomics

Date submitted: 15 Jul 2013 Electronic form version 1.4