

Abstract Submitted
for the DPP11 Meeting of
The American Physical Society

Dual-band infrared observation of temperature dynamics on the NSTX liquid lithium divertor (LLD)¹ A.G. MCLEAN, J-W. AHN, T.K. GREY, R. MAINGI, ORNL, J.H. NICHOLS, Princeton University, H.W. KUGEL, A.L. ROQUEMORE, PPPL — The combined presence of lithium, with low emissivity, and ATJ graphite, with high emissivity, introduce significant error in traditional single-band infrared (IR) observation for measurement of surface temperatures and calculation of impinging heat flux. To account for variable emissivity especially for observation of the liquid lithium divertor starting in 2010, and Molybdenum tiles starting in 2011, a high speed IR camera on NSTX has been adapted to dual-band, and a new wide-angle IR camera is being implemented with dual-color. In 2010, heating of the LLD surface by repeated plasma exposure was shown to incrementally increase the melted area fraction, but that fraction was found not to change significantly through any single discharge. The surface temperature near the outer strike point at toroidal locations on the LLD was found to be clamped compared to the same major radius on graphite suggesting a possible role of vapor shielding. These observations and new capabilities for the 2011/2012 campaign are presented.

¹Supported by US DOE contract numbers DE-AC05-00OR22725, DE-AC02-09CH11466.

A.G. McLean
ORNL

Date submitted: 15 Jul 2011

Electronic form version 1.4