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Analyzing Heat Flux in the NSTX Diverter with Fast and Slow Infrared Cameras NATHAN GARDNER, Lawrence Technological University, RAJESH MAINGI[1], Oak Ridge National Laboratory — Studying heat fluxes in NSTX's plasma facing components (PFCs) with the use of fast and slow IR cameras reveals what conditions PFC materials are subject to and how different materials withstand those conditions. Analytical, 1-D heat flux calculations are used to demonstrating fluctuations in heat flux as a function of diverter radius and time. Existing 1-D analysis software has been modified to include new liquid lithium divertor (LLD) trays and ATJ graphite tiles in the NSTX diverter and to utilize temperature dependant material parameters. Preliminary studies have shown that the LLD trays undergo a higher heat flux than the graphite tiles. A numerical, 2-D code, THEODOR, is also investigated as an improved solution for calculating heat fluxes. THEODOR includes the effect of a thin lithium film which is not necessarily in good contact with the underlying materials. Finally, both 1-D and 2-D codes are applied to the ORNL fast IR camera which, in 2010, was upgraded to capture simultaneous images in two IR wavelength bands. The first results of the heat flux study with the fast IR camera will be discussed.

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