Abstract Submitted
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Measurements and Interpretive 2D Edge Modeling of Lithiated NSTX Discharges[1] TRAVIS GRAY, JOON-WOOK AHN, JOHN CANIK, ORNL, MICHAEL JAWORSKI, RAJESH MAINGI, ROBERT GOLDSTON, ROBERT KAITA, MASA ONO, FILIPPO SCOTTI, PPPL, ADAM MCLEAN, VSEVOLOD SOUKHANOVSKII, LLNL — The National Spherical Torus Experiment (NSTX) has made extensive use of evaporative lithium coatings for improved discharge performance such as reduced divertor recycling, increased plasma stored energy and duration, and the elimination of Edge Localized Modes (ELMs). Measurements of divertor heat flux are accomplished with a unique dual-band IR (DBIR) thermography system to mitigate the effects of changing surface emissivity. Measurements from the DBIR system show reduced divertor surface temperature at the outer strike point for the case with 300 mg of lithium deposition. This results in the divertor heat flux being reduced from 5 to 2.5 MW/m^2. In turn, a reduction in divertor power accounting at the outer strike point is measured with increased lithium evaporation such that $P_{div}^{IR}/P_{loss} \sim 0.3$ – 0.5 for discharges with 150 mg of lithium and 0.12 – 0.2 for discharges with 300 mg of lithium. The reduction in divertor power is correlated with an increase in divertor radiation for discharges with 300 mg of lithium evaporation.

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