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Plan for UTK Thermography and Spectroscopic Diagnostics Evaluation of NSTX-U Spherical Torus Plasma BRIAN WIRTH, KAIFU GAN, University of Tennessee — This presentation describes recently installed spectroscopy, and newly proposed infrared thermography, diagnostics in support of the NSTX Upgrade physics mission; and the plans to utilize this diagnostic information to contribute to the understanding of impurity transport in the scrape off layer (SOL) and the role of lithium versus boron wall conditioning on impurity transport and thermal heat flux spatial and temporal profiles in the upper and lower divertor of NSTX-U. The recently installed diagnostics provide a view of the lower region of the central stack and the upper divertor with high-resolution UV-VIS-NIR spectroscopy. Additionally, we plan to install new infrared cameras to provide thermography in three locations, namely the outer strike points of the upper and lower divertor and a wide-angle view of the most of the first wall. The scientific objectives can be summarized as providing experimental validation of impurity transport through the SOL, in addition to evaluating boron versus lithium wall conditioning and the flow of boron and lithium ions, and chemical species, through the SOL, and to assess i) heat flux width measurements, ii) the role of wall conditioning on the heat flux magnitude and spatial distributions, in addition to spectroscopic imaging of the transport of impurities through the scrape-of-layer, iii) striated heat flux patterns within the divertor and PFCs; and iv) assessing the up-down power balance in NSTX-U.

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