

Abstract Submitted
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Design and Deployment of a Wide-Angle Two-Color Infrared Camera with Optical Relay on NSTX¹ J.H. NICHOLS, PPPL, A.G. MCLEAN, R. MAINGI, J.-W. AHN, ORNL, A.L. ROQUEMORE, B.C. STRATTON, R. KAITA, H.W. KUGEL, PPPL, K. GAN, ASIPP, M. BENJAMIN, Princeton U. — A new 30 Hz infrared camera featuring a wide-angle view of the lower divertor has been installed on the National Spherical Torus Experiment (NSTX). This camera utilizes a dichroic beamsplitter to project two IR channels (a 7-10 μm wavelength band and a 10-14 μm wavelength band) of the same image side by side on its uncooled microbolometer detector; taking the ratio allows the camera to make temperature measurements that are nearly independent of surface emissivity, an important quality because of the use of highly reflective lithium coatings on top of highly emissive graphite tiles. The camera looks through a reentrantly-mounted chemical vapor deposited (CVD) diamond window, chosen because of its high infrared transmission and ability to withstand a 350 ° C vessel bakeout. A cost-effective reflective relay has also been built to remove the camera from regions of strong magnetic field while avoiding chromatic aberrations. First diagnostic results from the 2011 NSTX run are presented.

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Jacob H. Nichols
Princeton Plasma Physics Laboratory

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