Abstract Submitted
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Design and Calibration of a Dispersive Imaging Spectrometer Adaptor for a Fast IR Camera on NSTX-U[1] RICHARD REKSOATMODJO, College of William and Mary, TRAVIS GRAY, Oak Ridge National Laboratory, PRINCETON PLASMA PHYSICS LABORATORY TEAM — A dispersive spectrometer adaptor was designed, constructed and calibrated for use on a fast infrared camera employed to measure temperatures on the lower divertor tiles of the NSTX-U tokamak. This adaptor efficiently and evenly filters and distributes long-wavelength infrared photons between 8.0 and 12.0 microns across the 128x128 pixel detector of the fast IR camera. By determining the width of these separated wavelength bands across the camera detector, and then determining the corresponding average photon count for each photon wavelength, a very accurate measurement of the temperature, and thus heat flux, of the divertor tiles can be calculated using Plank's law. This approach of designing an exterior dispersive adaptor for the fast IR camera allows accurate temperature measurements to be made of materials with unknown emissivity. Further, the relative simplicity and affordability of this adaptor design provides an attractive option over more expensive, slower, dispersive IR camera systems.

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