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Imaging bolometer development for application to fusion reactor diagnostics¹ B.J. PETERSON, NIFS, Toki-shi, 509-5292, Japan, A.G. ALEK-SEYEV, TRINITI, Troitsk, 142190, Russia, S. KONOSHIMA, JAERI, Naka-machi, 311-0193, Japan, N. ASHIKAWA, NIFS, H. PARCHAMY, NIFS, M. SASAO, Tohoku University, Sendai 980-8579, Japan, M. ISOBE, NIFS, Y. MIURA, JAERI — The imaging bolometer concept is based on a thin foil which absorbs the broad-band radiation and/or energetic particles from the plasma. The resulting temperature change in the foil is measured by an infrared camera located outside the vacuum vessel. Development of imaging bolometers is being carried out for applications in bolometry and lost alpha diagnosis for fusion reactors. In the case of an imaging bolometer, placing the foil behind a pinhole camera provides a two-dimensional image of the plasma radiation. In the case of a lost alpha diagnostic the foil is placed behind multiple layers of thin foils with one dimension being used for energy discrimination and the other layer being used for pitch angle discrimination. The work described includes the operation of imaging bolometers on the Large Helical Device and the JT-60U Tokamak, calibration experiments, testing prototype lost alpha diagnostic detectors on an ion beam facility and the design of an imaging bolometer and a lost alpha diagnostic for ITER.

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