

Abstract Submitted  
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**Design and Testing of Electron Bernstein Wave Emission Radiometers for the National Spherical Torus Experiment and the TJ-II Stellerator**<sup>1</sup> J.B.O. CAUGHMAN, J.B. WILGEN, M.D. CARTER, D.A. RASMUSSEN, P.M. RYAN, Oak Ridge National Laboratory, P.C. EFTHIMION, G. TAYLOR, Princeton University, A. CAPPÀ, F. CASTEJON, A. FERNANDEZ, CIEMAT, Madrid — Efficient Electron Bernstein wave (EBW) mode conversion is important for viable electron heating of high  $\beta$  plasmas, such as those on NSTX and TJ-II. Measurement of the thermal EBW emission from the plasma allows the EBW mode conversion efficiency to be determined, and also has the potential to offer a diagnostic for measuring electron temperature profile evolution. For NSTX, a dual-polarized quad-ridged broadband horn with a focusing lens is being used to measure the EBW emission at 20-40 GHz. A focused beam is needed to achieve efficient coupling at the mode conversion layer. The horn is mounted on a spherical base that can be moved up to 10 degrees in any direction. Emission from the plasma propagates through a glass lens and is focused on the horn. For TJ-II, a design using a corrugated horn configuration is being considered. For both systems, the field pattern from the horn or horn-lens combination has been measured with a 3-D scanning system in an effort to minimize the beam waist at the plasma edge. Details of the experimental results and future plans will be presented.

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