

Abstract Submitted  
for the DPP07 Meeting of  
The American Physical Society

**Kink Radial Eigenmode Structure Measurements Using a Hall Sensor Array on the HBT-EP Tokamak**<sup>1</sup> D. SHIRAKI, J.M. HANSON, R. JAMES, D.A. MAURER, M.E. MAUEL, G.A. NAVRATIL, T.S. PEDERSEN, Columbia University — A 20 element, 4mm resolution Hall sensor array directly measures the poloidal field and its fluctuations in the edge region of HBT-EP plasmas and in the surrounding vacuum [1]. We describe the calibration of the probe, and discuss measurements of kink mode radial eigen-mode phase and amplitude structure measured in the edge plasma and in the vacuum region nearby a conducting wall. These Hall probe measurements are compared to theoretical predictions of the Fitzpatrick-Aydemir model of kink mode dynamics [2] to derive the RWM and plasma mode eigenvectors describing the measured external fluxes. The model accurately takes into account the presence of the segmented HBT-EP stabilizing wall using finite element VALEN code modeling calculations. In discharges with resistive wall mode (RWM) activity, the measured mode structure in the vacuum region given by the model is consistent with Hall sensor array measurements. The use of these measurements to quantify the magnitude of plasma dissipation affecting the RWM will be reported. [1] Y. Liu, *et al*, Rev. Sci. Instr. **76**, 9, 93501, 2005. [2] R. Fitzpatrick and A. Y. Aydemir, Nuc. Fusion, **36**, 11, 1996.

<sup>1</sup>Supported by U.S. DOE Grant DE-FG02-86ER53222.

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Date submitted: 23 Jul 2007

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