

Abstract Submitted  
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**Multimode Measurements of Resistive Wall Modes near the Ideal Wall Stability Limit** J.P. LEVESQUE, J. BIALEK, P.J. BYRNE, B.A. DEBONO, B. LI, M.E. MAUEL, D.A. MAURER, G.A. NAVRATIL, N. RATH, D. SHIRAKI, Columbia University — An important instability that limits plasma performance in tokamaks is the resistive wall mode (RWM). When there are two or more unstable modes, or when a mode is near marginal stability, multimode effects may become important [1]. Multimode plasma response to feedback may be responsible for loss of RWM control in high  $\beta$  machines such as NSTX [2]. Typical HBT-EP plasmas operate near the ideal wall limit, where multimode effects are measurable. The recent HBT-EP upgrade has enabled high-resolution, high-sensitivity measurements of magnetic fluctuations from kink modes. We report measurements of natural multimode RWM activity in HBT-EP. Mode behavior is studied with respect to (i) proximity of the plasma to the ideal wall limit and (ii) geometry of the movable conducting wall. Measured mode structures and structural evolution are compared with predictions of DCON and VALEN. Rigidity of modes during growth, saturation, and decay is investigated. Supported by U.S. DOE Grant DE-FG02-86ER53222.

[1] Boozer A.H. 2003 Phys. Plasmas **10** 1458

[2] Sabbagh S.A. *et. al.* 2010 Nucl. Fusion **50** 025020

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