

Abstract Submitted  
for the DPP05 Meeting of  
The American Physical Society

**Onset and saturation of the kink instability in a current carrying, line-tied plasma** WILLIAM BERGERSON, CARY FOREST, GENNADY FIKSEL, ROCH KENDRICK, DAVE HANNUM, JOHN SARFF, SAM STAMBLER, University of Wisconsin — The MHD stability properties of a line-tied plasma in the Rotating Wall Machine. An internal kink instability is observed to grow when the safety factor  $q = \frac{4\pi^2 r^2 B_z}{\mu_0 I_p(r) L}$  drops below 1 inside the plasma. After a brief growth phase, the mode then saturates as a rotating helical equilibrium. The main diagnostics for measuring the MHD stability is a 2D array of 80 radial magnetic field sensors surrounding the plasma column and a segmented anode, which serves to measure current distribution inside the plasma. The 2D array indicates a plasma dominated by n=1, m=1 modes. In addition to the ideal mode, reconnection events are observed to periodically flatten the current profile and alter the magnetic topology. Resistive MHD or reconnection events redistribute the current in the plasma, which itself is observed with the segmented anode. Finally, initial results of a resistive wall surrounding the plasma will be presented. This work was supported by the DoE.

William Bergerson  
University of Wisconsin

Date submitted: 23 Jul 2005

Electronic form version 1.4