Abstract Submitted
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Identification of the resistive wall mode in the rotating wall machine W.F. BERGERSON, university of wisconsin, C.B. FOREST, G. FIKSEL, D. HANNUM, R. KENDRICK, S. OLIVIA, J.S. SARFF, ROTATING WALL MACHINE TEAM — The MHD stability properties of a line-tied plasma have been studied in a linear screw pinch device. Both an internal and external kink instability are observed to grow when the safety factor $q = \frac{4\pi^2 r^2 B_z}{\mu_0 I_p(r) L}$ approaches 1 inside the plasma. The growth rate of the internal kink is independent of the wall time, while the external kink growth scales with the wall time, as predicted by theory. After a brief growth phase, the modes saturate and create a helical equilibrium. Evidence of the internal modes suppressing the external kink will be presented. The main diagnostics for characterizing the MHD activity are a 2D array of 80 radial magnetic field pickup coils surrounding the plasma column, a segmented anode, which serves to measure current distribution inside the plasma, and an array of 40 poloidal and axial magnetic field coils just inside the conducting shell. These sensors identify a dominant poloidal mode m=1 and axial mode n=1 kink structure. This work was supported by the DoE.

W.F. Bergerson
university of wisconsin

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