Abstract Submitted
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Studies of Line-tied Reconnection on the RWM Experiment[1] M. BROOKHART, C.B. FOREST, D.A. HANNUM, R. KENDRICK, G. MENGIN, C. PAZ-SOLDAN, University of Wisconsin - Madison — An internal kink instability has been observed to grow and saturate in the Rotating Wall Machine Experiment. Detailed measurements show that an ideal, line-tied kink mode begins growing when the safety factor drops sufficiently below 1 inside the plasma; the saturated state corresponds to a rotating helical equilibrium. In addition to the ideal mode, reconnection events have been observed to periodically flatten the current profile and change the magnetic topology. The reconnection events strongly resemble the reconnection phenomena described in numerical simulations of a nearly identical geometry. Recently, the 2D equilibrium current profile has been measured using an axially and radially scanning magnetic probe so that better comparisons between experiment and theory can be carried out. The measurements show the current channel diffuses radially, inconsistent with Spitzer resistivity. To determine the effect of neutrals on conductivity, neutral fraction is being independently quantified via Hα emission. Future work will involve the construction and installation of a 2D coil array to measure fluctuations in the current at the axial midpoint of the experiment in an effort to characterize the reconnection rate in this inherently 3D geometry.

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Matthew Brookhart
University of Wisconsin - Madison

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