Abstract Submitted
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Equilibrium and Stability of Solar-Relevant Magnetized Arc Discharges[1] C.E. MYERS, M. YAMADA, E.E. LAWRENCE, H. JI, R.M. KULSRUD, S. DORFMAN, J. YOO, T.D. THARP, Princeton Plasma Physics Laboratory — The equilibrium and stability properties of partial toroidal arc discharges are studied in the laboratory. These discharges, which are produced between two electrodes in the Magnetic Reconnection Experiment (MRX), have an arched magnetic flux rope topology that is similar to structures in the solar corona. Using internal magnetic probes and a fast framing camera, the discharge equilibria are found to expand and contract in response to radially-directed $\mathbf{J} \times \mathbf{B}$ forces. Preliminary indications of eruptive phenomena are also observed. With regard to stability, the effect of the electrode boundary conditions on the external kink instability is studied in detail. In particular, it is found that changing the boundary conditions at the anode from fixed to free changes both the observed mode structure and the measured stabilization criteria. The ongoing development of enhanced diagnostics will also be discussed.

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