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The Stability of Hollow and Zero-net Current Plasmas in a Line-Tied Geometry[1] MATTHEW BROOKHART, CARLOS PAZ-SOLDAN, ANDREW ECKHART, CARY FOREST, University of Wisconsin - Madison — The Line-tied Reconnection Experiment, a linear screw pinch with line-tied axial boundaries, creates plasma via a hexagonally-packed array of nineteen electrostatic current injectors (washer guns). These guns inject individually controlled current and density filaments which merge to form azimuthally symmetric plasmas. Hollow current profiles are explored and shown to be unstable at high safety factor (>10). The eigenmodes of these instabilities display non-line tied behavior. The injection of opposing current at the center of the device stabilizes the hollow current plasmas and may provide more rigorous line tying. Plasmas with no net current are explored and undergo sudden shifts in magnetic topology reminiscent of Magnetic Reconnection. Recent improvements to the device allow simultaneous detailed measurements of equilibrium and stability.

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