Abstract Submitted
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The MOCHI LabJet Experiment[1] SETTHIVOINE YOU, JENS VON DER LINDEN, KEON VEREEN, ERIC SANDER LAVINE, EVAN CARROLL, ALEX CARD, MANUEL AZUARA ROSALES, MORGAN QUINLEY, University of Washington — The MOCHI LabJet experiment aims to simulate a magnetically driven jet launched by an accretion disk in the laboratory. The design uses three concentric planar electrodes linked by a vacuum magnetic field to drive azimuthal and axial shear flows in a jet configuration. Azimuthally symmetric gas sources reduce any anchoring effects on azimuthal rotation of the plasma. Two pulse-forming networks bias the electrodes to control the radial electric field profile and the azimuthal shear rotation profile. The dynamics of plasma jets are observed with 3D high-resolution magnetic probe arrays and computed vector tomography of ion Doppler spectroscopy. Vector tomography is capable of reconstructing 3D ion flow fields. Time-resolved measurements will determine if magnetic helicity is converted into ion kinetic helicity as predicted by the theory of canonical helicity transport. The theory suggests that fundamental tubes of magnetic flux with helical flows (canonical flux tubes) could be stabilized to large aspect-ratios by converting helical magnetic pitch into helical shear flows.

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