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Internal Shear Flows in the Large Plasma Device ERIC LAWRENCE, WALTER GEKELMAN, PATRICK PRIBYL, STEPHEN VINCENA, UCLA — Plasmas that have localized shear flow have long been of interest to both the fusion and space plasma physics communities. A small barium oxide coated nickel emissive cathode ($d \sim 10$ cm) was constructed to create a rotating plasma in the core of the background plasma column ($n_e \sim 3 \times 10^{12}$ cm^{-3}, 0.4 kG $\leq B \leq$ 2.5 kG, $d \sim 60$ cm, and $L \sim 18$ m) of the Large Plasma Device (LAPD) at UCLA. The background plasma is formed by a pulsed DC discharge from a large ($d \sim 0.7$ m) emissive cathode. The small cathode is located 12 m downstream from the background plasma source. It is surrounded by a ring anode to create $E \times B$ rotation in a 1 cm wide annular ring within the main plasma core. Previous laboratory shear flow experiments were done in devices that could only support electrostatic modes, while this experiment supports Alfvén modes. Diagnostics include magnetic, Mach, and Langmuir probes, and laser induced fluorescence. Research supported by the Department of Energy and conducted at the Basic Plasma Science Facility at UCLA.

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