

Abstract Submitted
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A laboratory experiment for studying the eruption of a magnetic flux loop in a large magnetized plasma¹ SHREEKRISHNA TRIPATHI, WALTER GEKELMAN, Department of Physics and Astronomy, UCLA — A new experiment has been constructed to simulate the interaction of erupting coronal loops with the ambient solar plasma. The laboratory plasma loop is produced using an annular LaB₆ cathode and an annular anode mounted on two movable shafts in a large vacuum chamber (1.0 m diameter, 4.5 m long). Each electrode has an electromagnet to produce a vacuum magnetic field along the axis of the flux loop. The maximum magnetic field at the foot-points of the flux loop is ~ 0.1 T. Two laser beams (1064 nm, ~ 0.5 J/pulse) strike movable carbon targets placed behind the orifices of the electrodes to generate controlled flows. This set-up produces a magnetic flux loop with maximum density $\sim 5 \times 10^{19} \text{ m}^{-3}$ and maximum discharge current 250 A. The vacuum chamber has ~ 0.03 T axial magnetic field and additional source for producing the ambient plasma. Langmuir probe, magnetic loop probe, and fast imaging camera are main diagnostics. We plan to present the initial results from this experiment characterizing the flux loop and showing the details of its evolution in the ambient plasma.

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