

## Creating and characterizing magnetic plasma loops

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Arched plasma structures, akin to those seen in the low solar corona, are created in a Caltech laboratory experiment. These laboratory plasmas, unlike their solar counterparts, are customizable, reproducible, and can be measured *in situ*.

The Caltech experiment uses a plasma gun that produces a single, arched, plasma-filled flux tube. These structures exhibit a quasi-equilibrium: plasma is magnetically confined within the minor radius of the flux tube, but the axis of the flux tube is free to evolve over time. As this axis lengthens and kinks, the total volume of the flux tube increases, but the structure remains filled with high-density plasma. This is due to high-speed bulk flows, observed to emanate from both footpoints of the arched flux tube.

Experiments with different ion species and plasma currents indicate dependence of the flow speed on mass density and azimuthal field strength. B-dot probes are used to measure the three-dimensional magnetic structure of the flux tube.

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