

# **Current Sheath Studies in a Small Plasma Focus Operating in Hydrogen–argon Mixtures**

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## **Abstract**

We present preliminary time and space resolved studies of current sheath formation in Plasma Focus discharges, using a novel array of non-invasive magnetic field probes. The experiments are performed in a Mather type plasma focus, operating at 2 kV. The discharge is formed between a hollowed anode and six symmetrically arranged cathode rods. The array of small magnetic probes is located along the cathode rods. The probes are of millimeter size. They are shielded behind the rods, as to minimize capacitive coupling to the anode electrode, and allow non-perturbing measurements to be made. A simple analytical model of current sheath evolution is used to analyze the probe signals. The experiments have been performed in pure Hydrogen and Hydrogen with Argon mixture, at pressures from below 0.2 Torr upwards. The effect of the Argon mixture on the current sheath structure is investigated with the probe array. It is found that at constant mass density operation, the increase in the percentage of Argon results in a thinner sheath, with steeper current profile.