Abstract Submitted
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Writhe of a Laboratory Arched Magnetized Plasma evolving in a Sheared Magnetic Field[1] KAMIL SKLODOWSKI, SHREEKRISHNA TRIPATHI, TROY CARTER, University of California, Los Angeles — Solar atmosphere is abundant in arched magnetized plasma structures (i.e. solar prominences, coronal loops). We study laboratory analogues of solar arched plasma structures to gain a better insight into fundamental processes governing its spatiotemporal evolution. The arched plasma is produced using a hot-cathode lanthanum hexaboride (LaB_6) source and it evolves in an ambient magnetized plasma produced by another LaB_6 source [1, 2]. Typical plasma parameters are: $\beta \approx 10^{-3}$, Lundquist number $\approx 10^2$ - 10^5, B $\approx$ 1000 Gauss at footpoints, plasma radius/ion gyroradius $\approx$ 20, B = 0-50 G in the ambient plasma, and 0.5 Hz repetition rate. We present recent results on measurements of plasma density, electron temperature, and three-dimensional magnetic field. Results demonstrate formation of S and reverse-S shaped current-filaments depending on the direction of the ambient magnetic field. Role of magnetic-shear and relative strengths of magnetic-fields of the arched and ambient magnetic fields will be discussed. These results indicate that occurrence of kink-instability is not a necessary condition for producing S or reverse-S shaped filaments on the Sun.

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