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Visualization of the collisional process and kinetic energy dissipation of two colliding suprathermal plasma jets G.S. YUN, S.K.P. TRIPHATI, P.M. BELLAN, California Institute of Technology — We present an experimental study of an arch-shaped laboratory plasma structure, similar to solar coronal loops, having two counterstreaming internal flows using a high-speed camera and a high-resolution spectroscopic system. The spectroscopic system measures emission spectra from multiple (up to 12) locations of the plasma simultaneously with variable time and space resolution, permitting observation of plasma parameters such as velocity, density and temperature along the jet axis. The camera and spectroscopic diagnostics show that an arched flux tube flared in the middle is initially formed with both of its footpoints being attached to gas feeds and subsequently become collimated by an MHD pumping process†, creating a high velocity ($\sim$ 20 km/s) jet outflowing from each footpoint toward the middle. The two counterstreaming jets collide in the middle, which creates a bright region at the apex. However, the excitation temperature estimated from line intensity ratios shows negligible temperature variation along the jet axis including the bright region. We plan to visualize in detail the bright region, and plan to measure the ion temperature and density gradients along the jet axis to study the dissipation of the kinetic energy of the colliding jets. † P. M. Bellan, *Why current-carrying magnetic flux tubes gobble up plasma and become thin as a result*, Phys. Plasmas 10 Pt 2, 1999 (2003).

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