

Abstract Submitted  
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**Formation of a bifurcated current layer by the collision of supersonic magnetized plasmas**<sup>1</sup> LEE SUTTLE, JACK HARE, SERGEY LEBEDEV, Imperial College London, ANDREA CIARDI, Sorbonne Universits; Observatoire de Paris, NUNO LOUREIRO, Massachusetts Institute of Technology, GUY BURDIAC, JERRY CHITTENDEN, THOMAS CLAYSON, Imperial College London, JIMING MA, Northwest Institute of Nuclear Technology Shaanxi, NICOLAS NIASSE, TIMOTHY ROBINSON, ROLAND SMITH, NICOLAS STUART, FRANCISCO SUZUKI-VIDAL, Imperial College London — We present detailed experimental data showing the formation and structure of a current layer produced by the collision of two supersonic and well magnetized plasma flows. The pulsed-power driven setup provides two steady and continuous flows, whose embedded magnetic fields mutually annihilate inside the interaction region giving rise to the current layer. Spatially resolved measurements with Faraday rotation polarimetry, Thomson scattering and laser interferometry diagnostics show the detailed distribution of the magnetic field and other plasma parameters throughout the system. We show that the pile-up of magnetic field ahead of the annihilation gives rise to the multi-layered / bi-directional nature of the current sheet, and we discuss pressure balance and energy exchange mechanisms within the system.

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