Abstract Submitted
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Shock formation in pulsed-power driven counter-propagating jets[1] F. SUZUKI-VIDAL, Imperial College London, UK, C. SEYLER, Cornell University, Ithaca, NY, USA , S.N. BLAND, L.G. SUTTLE, S.V. LEBEDEV, Imperial College London, UK — We present experiments and numerical simulations looking at the formation of shocks from the collision of two counter-propagating supersonic jets. The jets were driven on the MAGPIE pulsed-power facility which delivered a ∼900 kA, 300 ns zero to peak current through two aluminum radial foils connected in series and separated by 30 mm. The jets have a tip velocity of ∼100 km/s and are surrounded by a low-density plasma wind that acts as a mass source and supports advected toroidal magnetic surrounding the jet. The collision between the two jets leads to the formation of a bow shock surrounded by an extended standing shock. These experimental results [1] are investigated with the Extended-MHD code PERSEUS, which shows that the opposite direction of the current through each foil leads to different plasma dynamics that form the shocks through a combination of hydrodynamic and magnetized plasma flows. [1] F. Suzuki-Vidal, S.V. Lebedev, A. Ciardi, L.A. Pickworth, R. Rodriguez, J.M. Gil, G. Espinosa, P. Hartigan, G.F. Swadling, J. Skidmore, G.N. Hall, M. Bennett, S.N. Bland, G. Burdiak, P. de Grouchy, J. Music, L. Suttle, E. Hansen, and A. Frank, ApJ 815:96 (2015).

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Francisco Suzuki-Vidal
Imperial College London

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