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Study of colliding jets and shock formation for laboratory astrophysical phenomena on a small scale current driver[1] JULIO VALENZUELA, GILBERT COLLINS, DEREK MARISCAL, FARHAT BEG, University of California, San Diego — In this work we demonstrate the ability of a small linear transformer driver (LTD) yielding a 250 kA current in 150 ns to produce counter-propagating flows. The flows were produced by two vertically opposed conical arrays comprised of 8 wires, separated by a 1cm tall cylindrical insulating spacer. A section of the cylinder was removed from both sides to allow observation of the jets. Different materials were tested in order to vary the radiative cooling parameter as well the mean free path of the flow. With this array configuration we are able to produce counter-propagating jets, with velocities of the order of 1e7cm/s. A shock was observed at the colliding region that remains stationary for an extended period of time. A mean free path larger than the jet size was calculated for aluminum, making it very promising for studying astrophysical collisionless shocks. Investigation of instability formation in the shock region and eventual magnetic field production will be discussed.

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