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Generation of supersonic plasma jets from pulsed-power driven exploding wire experiments[1] SIMON BOTT, DAVID HAAS, YOSSOF ESHAQ, UTAKO UEDA, ROBERT MADDEN, GILBERT COLLINS, FARHAT BEG, University of California, San Diego, CENTER FOR ENERGY RESEARCH, UNIVERSITY OF CALIFORNIA, SAN DIEGO TEAM — Astrophysical jets and supersonic outflows are associated with a wide range of phenomena. Determination of the processes which dominate jet behaviour can be used to infer the properties of their sources which include Young Stellar Objects (YSO) and Active Galactic Nuclei (AGN). Limited observational data makes the construction of theoretical descriptions problematic, and scaled laboratory experiments represent a useful test-bed for assessing the dominant physics. We present experiments studying the generation of plasma jets in exploding wire experiments for both x-pinch and conical configurations. These will be examined at 80 kA and 250 kA and diagnosed by laser interferometry and time-resolved self emission to infer the electron density and temperature range respectively. Estimations of the dimensionless parameters (Mach number, jet/ambient density ratio, cooling parameter) will be given for each experiment. Future studies and scaling of experiments to larger currents will be discussed.

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