Abstract Submitted
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Study of the effect of collisionality and cooling on the interactions of counter-streaming plasma flows as a function of wire material[1] GILBERT COLLINS, JULIO VALENZUELA, NICHOLAS AYBAR, FABIO CONTI, FARHAT BEG, University of California, San Diego — We report on the effects wire material on collisionality and radiative cooling on the interactions of counter-streaming plasma jets produced by conical wire arrays on the $\sim$ 200 kA GenASIS driver. In these interactions, mean free path (λ_{mfp}) scales with jet velocity (v_{jet}^4), atomic mass (A^2), and ionization ($Z^{*\ -4}$), while cooling scales with atomic mass. By changing the material of the jets one can create slowly cooling, weakly collisional regimes using C, Al, or Cu, or strongly cooled, effectively collisionless plasmas using Mo or W. The former produced smooth shocks soon after the jets collide (near the peak current of 150 ns) that grew in size over time. Interactions of the latter produced multiple structures of a different shape, at a later time ($\sim$ 300 ns) that dissipated rapidly compared to the lower Z materials. We will report on the scaleability of these different materials to astrophysical phenomena.

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