

Abstract Submitted
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Analysis of laser-produced jets from locally heated targets¹ HOLGER SCHMITZ, ALEX ROBINSON, STFC, Rutherford Appleton Laboratory — Recent simulations showed that it might be possible to produce a jet by locally heating a foil target with a high intensity laser, so as to produce a single blast wave which then drives jet formation. In contrast to many earlier experimental setups, the jets in this configuration are formed by a two stage process similar to that thought to be responsible for jets from young stellar objects. As the blast wave expands into the ambient medium it creates an inverse conical density structure. This inverse cone focuses the flow into a conically converging flow which then turns into a narrow jet. The realisation of this two step process in an experiment could make it possible to study the formation of stellar jets in the laboratory. We present new results investigating the criteria that lead to the creation of the inverse conical structure and the subsequent jet formation. The localised heating necessary for driving the jet is achieved by guiding the electrons in self generated magnetic fields at resistivity gradients. We present simulations demonstrating the geometries that lead to the localised heating suitable for jet formation.

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