Experimental studies of magnetically driven supersonic plasma jet

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Results of the recent experiments with radiatively cooled jets performed on the pulsed power MAGPIE facility (1.5MA, 250ns) at Imperial College will be presented. The main part of the presentation will concentrate on the dynamics of magnetically driven jets, in particular on formation of episodic outflows [1]. Experimental data on the energy balance in the magnetically driven jets, the conversion of the Poynting flux energy into kinetic energy of the outflow, will be presented.
We will also present results of experiments with “hydrodynamic” radiatively cooled supersonic jets formed in conical wire arrays, and discuss how this set-up can be scaled to 20MA Z facility.

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References

[1] A. Ciardi, S.V. Lebedev, A. Frank et al., The Astrophysical Journal, 691: L147–L150 (2009).