

Abstract Submitted
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Episodic Magnetic Tower Jets in Laboratory Experiments¹ F. SUZUKI-VIDAL, S.V. LEBEDEV, S.N. BLAND, G. BURDIAC, J.P. CHITTENDEN, G.N. HALL, A.J. HARVEY-THOMPSON, E. KHOORY, L. PICKWORTH, G. SWADLING, Imperial College London, A. CIARDI, Ecole Normale Supérieure, C. STEHLE, Observatoire de Paris — Results from laboratory astrophysics experiments showing the formation of episodic plasma jets will be presented. The jets are highly supersonic, radiatively cooled and driven by the pressure of the toroidal magnetic field in a ‘magnetic tower’ configuration. The 1 MA, 250 ns current pulse from the MAGPIE generator is introduced into a radial foil, an aluminium disc held between two concentric electrodes. The ablation of plasma from the foil close to the central electrode forms a radial gap which triggers the formation of the jets. Several diagnostics including magnetic and inductive probes were used to study their dynamics, particularly their launching mechanism. The similarities with previous single-episode magnetic tower jets from radial wire arrays together with new measurements of dimensionless parameters such as the magnetic Reynolds number ($Re_M > 400$) indicate that the experiments can be scaled to astrophysical jets.

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F. Suzuki-Vidal
Imperial College London

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