

Abstract Submitted
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Episodic “Magnetic Tower” Plasma Jets in a Laboratory Experiment¹ SERGEY LEBEDEV, F.A. SUZUKI-VIDAL, Imperial College, A. CIARDI, Observatoire de Paris, S.N. BLAND, G. HALL, J.P. CHITTENDEN, A. HARVEY-THOMSON, A. MAROCCHINO, Imperial College, A. FRANK, E. BLACKMAN, University of Rochester, T. RAY, Dublin Institute for Advanced Studies, C. STEHLE, Observatoire de Paris — We will present experimental results on formation of supersonic radiatively cooled plasma jets driven by the pressure of the toroidal magnetic field. The experimental configuration allows generation of several episodes of the “magnetic tower” jet eruptions. The subsequent magnetic bubbles have higher propagation velocities and are catching up the previously ejected, producing shocks. These experiments suggest that periodic formation of magnetic tower jets in the astrophysical situations could be responsible for some of the variability of the astrophysical jets. The experiments are scalable to astrophysical flows in that critical dimensionless numbers such as the plasma collisionality, the plasma beta and the magnetic Reynolds number are all in the astrophysically appropriate ranges.

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Sergey Lebedev
Imperial College

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