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Formation of Radiatively cooled, Supersonically Rotating, Plasma Disks in Z-pinch experiments M. BENNETT, S.V. LEBEDEV, L. SUTTLE, G. BURDIAK, F. SUZUKI-VIDAL, J. HARE, G.F. SWADLING, S. PATANKAR, G.N. HALL, M. BOCCHI, J.P. CHITTENDEN, R.A. SMITH, Imperial College, A. FRANK, E. BLACKMAN, University of Rochester, R.P. DRAKE, University of Michigan, A. CIARDI, Paris observatory — We present data from z-pinch experiments aiming to simulate aspects of accretion disk physics in the laboratory. Using off axis ablation flows from a wire array z-pinch we demonstrate the formation of a hollow disk structure that rotates supersonically with velocity of $\sim$ 60km/s and M$\sim$2 for $\sim$ 150 ns. We use interferometry to measure the electron density as $>10^{19}$ cm^{-3} and analyze Thomson Scattered spectra to make estimates for the ion and electron temperatures; we find T_i $\sim$60 eV and ZT_e $\sim$150 to 200 eV. Using these parameters we calculate the Reynolds number for the plasma on the order 10^5 putting the experiment within the correct viscous regime for turbulent flow and scaling to accretion disks.

Sergey Lebedev
Imperial College

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