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Experimental study of pulsed power driven radiative shockwaves in noble gases[1] J. SKIDMORE, S. LEBEDEV, F. SUZUKI-VIDAL, S. BLAND, G. SWADLING, G. BURDIAK, G. HALL, S. PATANKAR, P. DE GROUCHY, L. SUTTLE, M. BENNETT, L. PICKWORTH, E. KHOORY, R. SMITH, Imperial College London, R. RODRIGUEZ, J. GIL, Universidad de Las Palmas de Gran Canaria — The use of plastic disks coated with a thin film of Aluminium has been investigated as a control mechanism for the shockwave formed from a radial foil z-pinch in the presence of an ambient medium. Experiments were carried out on the MAGPIE (1.4MA, 250ns rise time) facility at Imperial College London. The configuration produces a strong radiative shockwave driven with constant velocity ($>$ 25km/s) for long time ($>$ 400ns) and spatial scales (cm). Experimental results demonstrate scaling of shock compression opposite to that found in 1D radiation hydrodynamic simulations. Evidence of a thermal instability in the post-shock cooling region is linked to a decrease in compression for higher atomic masses due to increased radiative cooling. Increases in post-shock temperature and ionization have been measured with decreased radial distance from a strongly cooling hydrodynamic jet. Regions of observed thermal instability for Xenon and Krypton agree with those expected from evaluation of theoretical cooling functions.

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