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Astrophysical Connections to Collapsing Radiative Shock Experiments A.B. REIGHARD, R.P. DRAKE, U. MI., J.F. HANSEN, B. BLUE, LLNL, S. BOUQUET, L. BOIREAU, CEA Bruyeres, M. KOENIG, T. VINCI, Ecole Polytechnique — Radiative shocks occur in many high-energy density explosions, but prove difficult to create in laboratory experiments or to fully model with astrophysical codes. Low astrophysical densities combined with powerful explosions provide ideal conditions for producing radiative shocks. Here we describe an experiment significant to astrophysical shocks, which produces a driven, planar radiative shock in low density Xe gas. Including radiation effects precludes scaling experiments directly to astrophysical conditions via Euler equations, as can be done in purely hydrodynamic experiments. We use optical depth considerations to make comparisons between the driven shock in xenon and specific astrophysical phenomena. This planar shock may be subject to thin shell instabilities similar to those affecting the evolution of astrophysical shocks. This research was sponsored by the National Nuclear Security Administration under the Stewardship Science Academic Alliances program through DOE Research Grants DE-FG52-03NA00064, DE-FG53-2005-NA26014, and other grants and contracts.

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