Abstract Submitted
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Laser Driven Radiative Shocks in High Energy Density[1] C. MANKA, R. LUNSFORD, S. NIKITIN, RSI, Lanham, MD, M. LAMING, D. ZABATAKIS, J. GRUN, NRL, Washington, DC — The long time over which oscillations associated with radiative shocks within the interstellar medium occur makes direct observation of these instabilities highly problematic. A velocity dependant cooling instability is thought to cause fluctuations in the propagation velocity of such shocks. An experiment at NRL investigates and perhaps validates the applicability of present analytic models to various multidimensional radiative shock instabilities. The PHAROS laser at NRL is used to create the relevant shock front by ablative acceleration of an aluminized Mylar foil that covers a small gas filled tunnel in a PMMA block. As this shock propagates along the tunnel, a secondary shock is launched into the walls of the tunnel and the progress of this shock into the PMMA block preserves a continuous record of the primary shock's velocity as it travels the length of the tunnel. The density gradient associated with the shock in the PMMA is recorded using dark field shadowgraphy on a SIM-8 multi-channel high speed framing camera. The tunnel shock velocity is determined from the shape of the shock launched into the PMMA block for any time prior to the instant at which the image frame was taken, providing documentation of any oscillations in the velocity of the shock.

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