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High energy density radiative blast wave experiments in clustered gas targets HUGO DOYLE, STEFAN OLSSON-ROBBIE, MATTHIAS HOHENBERGER, Imperial College London, EDWARD GUMBRELL, ALASTAIR MOORE, AWE, Aldermaston, DAN SYMES, Rutherford Appleton Laboratory, ROLAND SMITH, Imperial College London, IMPERIAL COLLEGE LONDON TEAM, AWE, ALDERMASTON COLLABORATION, RUTHERFORD APPLETON LABORATORY COLLABORATION — Using the efficient absorption of laser energy by clustered gases allows the study of high energy density systems at low average density with table-top scale lasers. Thus generation of radiative shocks at moderate drive energies in high Z materials can be achieved for the purpose of laboratory astrophysics. Using the Vulcan laser we have performed radiative shock experiments. We observe radiative shell thinning in Ar at high shock velocities, increasing the shocks susceptibility to instabilities. Utilising streaked Schlieren measurements, we measure shock velocity oscillations in Kr for the first time, indicative of the thermal cooling instability [1]. We also report on advanced diagnostics for characterisation of blast wave propagation. These include temporally resolved temperature measurement, proton radiography and the use of a second, perpendicular blast wave to probe the primary shock ambient medium.

[1] M. Hohenberger et al., *submitted to Phys. Rev. Lett.*

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