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Structure in Radiative Shock Experiments F.W. DOSS, R.P. DRAKE, University of Michigan, H.F. ROBEY, Lawrence Livermore National Laboratory — Astrophysical systems in which radiation transport across a shock front contributes substantially to the properties and dynamics of the system may be modeled in laboratory experiments under high-energy-density conditions. Recent experiments on the Omega laser facility have launched Be discs into shock tubes of Xe gas at atmospheric pressure, producing radiative shocks with speeds over 100 km/sec that are then diagnosed by x-ray pinhole radiography. These experiments are found to develop rich internal structure. First, heating and ablation of the shock tube material ahead of the radiative shock drives a secondary, inwardly directed radial shock, which we call a wall shock. Second, these radiating shock systems become susceptible to hydrodynamic instabilities of thin shocked layers. This research was supported by the DOE NNSA under the Predictive Science Academic Alliance Program by grant DE-FC52-08NA28616, the Stewardship Sciences Academic Alliances program by grant DE-FG52-04NA00064, the National Laser User Facility by grant DE-FG03-00SF22021, and by the Stewardship Science Graduate Fellowship program.

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