Same-Shot X-Ray Thomson Scattering and Streaked Imaging of Radiative Shock Experiments at Omega

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We review the experimental design and present preliminary data from recent radiative shock experiments at the Omega Laser facility. Using a beryllium pusher to drive a shock in excess of 100 km/s in a xenon-filled shock tube creates a system where the density and temperature structure are significantly affected by radiation transport from the shock heated matter. To measure this system with high accuracy, streaked x-ray radiography and x-ray Thomson scattering diagnostics were employed on each shot. We detail how this diagnostic combination allows for precise interrogation of the different regions of the shock, including the radiation-heated upstream precursor, the radiatively collapsed cooling layer, and the downstream material. Preliminary analysis and plans for future iterations of radiative shock experiments are also discussed.

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