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Dynamic reflectance measurements of shocked materials¹ DANIEL DOLAN, Sandia National Laboratories — Temperature measurements are critical to equation of state development, but are notoriously difficult to perform and interpret. Infrared pyrometry is a valuable temperature diagnostic for a wide range of dynamic compression studies, but the technique is of limited use without knowledge of material emissivity. Although emissivity can be inferred from reflectance measurements—usually at ambient conditions—the manner in which this quantity changes with pressure, temperature, surface condition, and material phase is unknown. This presentation describes an emissivity characterization study of shockcompressed metal films. Real-time, infrared reflectance measurements are performed by coupling light from the VUV ring of the National Synchrotron Light Source to a gas gun system. As the samples are shock compressed, specular reflectance changes are measured using fast near- and mid-infrared detectors capable of tracking individual synchrotron pulses. This research provides data that can be used to constrain dynamic emissivity changes, and may lead to a set of emissivity standards that can be applied to any material.

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Daniel Dolan Sandia National Laboratories

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