

Abstract Submitted
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Coherent anti-Stokes Raman Spectroscopy (CARS) used to measure the temperature of shocked deuterium and hydrogen gas. JASON MANCE, Mission Support and Test Services — Temperature is an important parameter in shock wave science. Common methods for measuring temperature such as pyrometry, IR absorption, and spontaneous Raman scattering cannot be used in non-IR active gases such as hydrogen/deuterium. We demonstrate the use of Coherent Anti-Stokes Raman Spectroscopy (CARS) to measure the temperature of explosively driven shock waves in pure deuterium and hydrogen gases. We show that CARS is a viable method for making dynamic temperature measurements in shocked gases and discuss limitations and improvements that can be made to our current system. Moving forward we plan to use CARS to measure the temperature of shocked gases entrained with ejecta to study possible chemical reactions that may be occurring between the ejecta and surrounding gas. This diagnostic approach could have potential applications in other areas of shock wave research such as in detonation or equation of state experiments.

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