

Abstract Submitted  
for the SHOCK19 Meeting of  
The American Physical Society

**Shockwave Compression of Pre-Compressed H<sub>2</sub>-He Mixtures<sup>1</sup>**

SAKUN DUWAL, CHRISTOPHER SEAGLE, MARCUS KNUDSON, Sandia National Laboratories — We have performed shock compression experiments on pre-compressed H<sub>2</sub>-He mixtures. Studying pre-compressed samples of H<sub>2</sub>-He mixtures under dynamic loading allows us to access unique P-T states off of the principal Hugoniot. The understanding of material behavior at these P-T states is crucial to comprehend the origin and evolution of gas planets. Furthermore, the validation of mixture models has been a long-standing topic of interest with numerous conflicting theoretical results, particularly for non-ideal hydrogen systems. In an attempt to get a deeper knowledge in these matters, we have shock compressed mixtures of H<sub>2</sub>-He. Here, we present our experimental results on the pre-compressed samples of H<sub>2</sub>-He mixtures using pulsed-power-driven flyer plates at the Z-facility, and impact studies on the two-stage light gas gun.

<sup>1</sup>Sandia National Labs is managed and operated by National Technology Engineering Solutions of Sandia, LLC, a subsidiary of Honeywell International, Inc., for the U.S Dept. of Energys National Nuclear Security Administration under contract DE-NA0003525.

Sakun Duwal  
Sandia National Laboratories

Date submitted: 02 Mar 2019

Electronic form version 1.4