

Abstract Submitted  
for the SHOCK15 Meeting of  
The American Physical Society

**Radiance Measurement on Ramp Loading – Implications for Temperature on Quasi-Isentropes**<sup>1</sup> JEFFREY NGUYEN, MINTA AKIN, Lawrence Livermore National Laboratory, OLEG FAT'YNOV, PAUL ASIMOW, California Institute of Technology, NEIL HOLMES, Lawrence Livermore National Laboratory — Temperature increases along a quasi-isentropic loading path have the promise to characterize either the approach to constant entropy in the case of a known Grüneisen parameter or else to measure the Grüneisen parameter once the quality of the isentrope is established. Our group has developed the ability to synthesize graded density impactors able to generate customized multistep loading paths that included ramp loads, dwells, shock jumps and ramp unloads. Here we present a recent measurement of thermal radiance from a ramp-loaded Sn sample. The sample was shocked to approximately 0.5 Mbar, held at a constant pressure for 400 ns, and then ramp loaded to approximately 1.5 Mbar. Dynamic emissivity was not measured along this path, but radiance was monitored at the sample-LiF window interface as a function of time at 7 wavelengths in the visible spectrum with a spectral resolution of 80 nm. We will discuss experimental results and analysis of the relationship between pressure and radiance on the ramp-loading path of Sn with variable initial temperature along the sample. Assumptions employed in this analysis and implications for temperature along the ramp-loading path, for the closeness of approach to isentropic loading, and for the Grüneisen parameter of Sn will also be discussed.

<sup>1</sup>Prepared by LLNL under Contract DE-AC52-07NA27344.

Jeffrey Nguyen  
Lawrence Livermore National Laboratory

Date submitted: 30 Jan 2015

Electronic form version 1.4