Abstract Submitted for the SHOCK11 Meeting of The American Physical Society

Dissecting Lagrangian Velocities and Ramp Waves¹ DANIEL OR-LIKOWSKI, ROGER MINICH, Lawrence Livermore National Laboratory — Lagrangian velocities are typically the observational quantity for compression wave experiments that probe material response at high-pressure. Depending on the experimental compression methodology (high-explosive to laser), a wide range of strain rates are possible from 10^3 to 10^8 s⁻¹ yielding unique insight into non-linear wave propagation. We have been developing a method to understand the thermodynamic response of a material subjected to these high-pressure, compression waves. As part of that effort, we have found that the relationship between Lagrangian acceleration and the velocity offers insight into the material response and helps to dissect the velocity for subsequent analysis related to equation of state and non-elastic response mechanisms. We shall discuss this methodology and provide several examples.

¹This work performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344.

> Daniel Orlikowski Lawrence Livermore National Laboratory

Date submitted: 09 Mar 2011

Electronic form version 1.4