Abstract for an Invited Paper for the SHOCK11 Meeting of The American Physical Society

The ORTEGA experiment: A study of damage with radiography and velocimetry MICHAEL FURLANETTO, LANL

The ORTEGA experiment consisted of two identical samples of lead (4% antimony) driven by small charges of high explosive (HE). Flash x-radiography formed the key measurement. A short pulse of x-rays "froze" the motion much like a flash camera system and thereby permitted examination of the instantaneous internal spatial density distribution of the rapidly moving material. Two radiographs were taken encompassing both samples in each image and separated in time by \sim 4 microseconds to allow observation of the evolution of the samples. Over a longer period of time, the pressure loading of the lead was determined by measuring the velocity of the leading surface at six points on each sample. One of these points recorded velocity histories with the Velocity Interferometer System for Any Reflector (VISAR) diagnostic, while the other five were recorded with Photonic Doppler Velocimetry (PDV). Simultaneously, detonation symmetry in each package was monitored by electrical pins embedded in the HE. This presentation will review the experimental motivation, setup, and data, illustrating the reproducibility of shock measurements in HE-driven spall experiments by simultaneous measurement of two nominally-identical samples. Subsequent presentation will review pre-shot hydrocode calculations and will discuss the radiographic measurements in more detail.