Abstract Submitted
for the SHOCK09 Meeting of
The American Physical Society

Explosively Driven Damage in Beryllium[1] LAWRENCE HULL, Los Alamos National Laboratory — Four explosive shots were fired in a simple plane wave-driven shock arrangement to begin characterization of damage in Be. Two explosives, PBX-9501 and TNT were used as the driver and two thicknesses of Be were tested. The thinner Be was intended to not spall while the thicker samples were intended to spall. The primary diagnostic was PDV (three probes on each sample). The shot with the thick Be sample driven by PBX-9501 also included an x-ray taken 4 us after shock breakout. The velocity records reveal various features of interest for comparison to computational models. There is a precursor wave, appearing as a toe, on the initial shock. The shock amplitude and ultimate sample velocity is a function of the explosive type and, to a lesser degree, sample thickness. The classic ringing of the velocity in the spall scab is readily apparent in the thicker samples, and the details of the subsequent re-compressions are seen to be a function of the shot parameters. The x-ray was taken after the re-compression and analysis shows no evidence of an opening in the material at that particular time. Radiography alone indicates an intact sample after re-compression, but velocimetry indicates spall. This is an enigma encountered often, the usual explanation is that the damaged region is too slight to detect radiographically after re-compression.

[1]Supported by the United States Department of Energy, LA-UR 09-00809

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Date submitted: 13 Feb 2009 Electronic form version 1.4