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Response of Pt-based Bulk Metallic Glass to Shock Wave Compression B.M. LALONE, Y.M. GUPTA, Institute for Shock Physics and Department of Physics, WSU — Plate impact experiments were performed on platinum based bulk metallic glass (BMG) samples having a nominal composition of $Pt_{57.5}Cu_{14.7}Ni_{5.3}P_{22.5}$, a material previously reported to support large plastic strains under quasi-static, uniaxial stress loading (J. Schroers, and W. L. Johnson, Phys. Rev. Lett. **93,** 255506 (2004)). In the present shock wave experiments, peak longitudinal stresses ranged from 9-30 GPa. Piezoelectric pins and a velocity interferometer were used to measure shock velocities and particle velocity histories. A clear two-wave structure was observed in the particle velocity histories indicating an elastic-plastic response. The elastic wave amplitude was dependent on peak stress and sample thickness, with values ranging from 8.6 - 14.2 GPa. Measured wave profiles were converted to stress-density compression, and a nonlinear elastic model was fit to the measured elastic response. Unlike the quasi-static, uniaxial stress data on the same alloy, the shock wave, uniaxial strain results show a loss of strength above the elastic limit. Reasons for this strength loss are discussed. Work supported by the DOE.

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