

Abstract Submitted
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Response of silicon to shock wave compression along [100] and [111] orientations STEFAN J. TURNEAURE, Y.M. GUPTA, Washington State University — Silicon is a high strength, brittle solid that undergoes multiple compression induced phase transformations. To complement x-ray diffraction measurements to examine inelastic deformation and phase transformations in shocked Si, we have examined the continuum response of silicon under shock compression. Transmitted wave profiles were measured at Si/LiF interfaces using a velocity interferometer. Peak stresses ranged between 11 and 22 GPa. The measured HELs were 9.2 GPa and 7.7 GPa for [100] and [111] orientations, respectively. Following the phase transformation, which occurred at about 13.5GPa, the volume compression was roughly 23% for peak stresses ranging from 15 to 22 GPa. This volume compression is consistent with a completed phase transformation and is much larger than previously reported volume compressions [1,2]. Work supported by DOE. [1] W. H. Gust and E. B. Royce, J. Appl. Phys. **42**, 1897 (1971). [2] T. Goto et al., Jap. J. Appl. Phys. **21**, L369 (1982).

Stefan J. Turneaure
Washington State University

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