

SHOCK13-2013-000548

Abstract for an Invited Paper
for the SHOCK13 Meeting of
the American Physical Society

X-ray diffraction of shock driven phase transitions at the Linac Coherent Light Source

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The Linac Coherent Light Source provides a brilliant ultrafast pulse of hard x-rays that can be used to probe shock compressed material dynamics. In recent experiments, we have employed a nanosecond laser to shock compress single crystal and polycrystalline silica and silicon, while examining the resulting material dynamics with x-ray diffraction using this x-ray free electron laser. Experimental results on phase transition dynamics will be presented.