

Abstract Submitted
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Time-Resolved, Optical Spectroscopy Measurements of RDX Single Crystals Shocked along Different Orientations JAMES PATTERSON, NAOKI HEMMI, YOGENDRA GUPTA, Washington State University — Optical transmission measurements were obtained on RDX crystals shocked along three different orientations with stepwise loading up to 5.5 GPa. These orientations were chosen to activate one, both, or none of the known slip systems of RDX. All orientations exhibited broadband visible extinction as the shock front propagated through the RDX crystal. Crystals were shocked to peak stresses both above and below 3.8 GPa, the pressure for the α to γ phase transition obtained in static compression studies. For some orientations, the extinction did not increase smoothly, but exhibited transient changes before approaching a final level. The nature of this transient varied depending on the crystalline orientation and the peak stress reached during the experiment. Three general transient behaviors have been observed: a smooth increase to a final extinction level, a step-wise increase to a final level, or an overshoot in the absorption before reducing to a final level. Work supported by DOE and ONR.

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