Abstract Submitted
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Search for an elastic-plastic transition in single-crystal TATB using a laser drive[1] PAULIUS GRIVICKAS, MATT NELMS, RYAN AUSTIN, BRUCE BAER, JONATHAN CROWHURST, MATTHEW KROONBLAWD, SUZANNE ALI, CAROL DAVIS, THOMAS BUNT, THOMAS MYERS, MICHELLE RHODES, JOE ZAUG, LARA LEININGER, Lawrence Livermore Natl Lab — While shock initiation and sensitivity of TATB-based explosives is believed to be controlled by their heterogeneous microstructure, the development of comprehensive physical models understanding these processes requires knowledge of the mechanical response of the crystalline material itself. Elastic-plastic transitions are helpful in guiding such development, but two-wave structure measurements have not yet been reported in single-crystal TATB due to a lack of samples large enough for experimentation. In this work we attempt to overcome these limitations by investigating 50-150 micrometer thick single crystals of TATB using the Janus platform at the Jupiter Laser Facilities. We present measured wave profiles at different experimental conditions and our efforts to model these observations using a crystal-mechanics framework.

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