Abstract Submitted
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Crystallographic Damage Formation at the Breakout Surface in Copper during Shock Loading[1] AARON KOSKELO, SCOTT GREENFIELD, DARRIN BYLER, ROBERT DICKERSON, SHENG-NIAN LUO, KENNETH MCCLELLAN, Los Alamos National Laboratory, PEDRO PERALTA, Arizona State University — We are using Transient Imaging Displacement Interferometry (TIDI) to unravel the dynamics of damage formation in copper. The images obtained from TIDI reveal a rich and complex dynamics during shock and release at the specimen's breakout surface in flyer plate-launched shock experiments. Included in the observations are elastic movement of grain boundaries and onset of damage at grain boundary junctions that remains in the material post-shot. In single crystal targets, we have also observed localized regions of damage having crystallographic symmetry that appear in the leading compression edge of the shock-up, persist through the release and remain in the material post-shot. This talk will focus on our single-crystal results and observations concerning the unexpected early-time phenomenon.

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