Abstract Submitted
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Dynamic diffraction measurements of Ta lattice response under Mbar shock loading conditions[1] BRUCE REMINGTON, LLNL — We will report on experiments done on the Omega laser to determine the strength of shock-loaded single-crystal [100] tantalum using in-situ broadband x-ray Laue diffraction. The inferred strength reaches 350 kbar at a shock pressure of 1.8 Mbar and is in excellent agreement with a multiscale strength model, which employs a hierarchy of simulation methods over a range of length and time scales. Laser driven shock experiments using in situ Bragg diffraction were also performed at the Omega-EP laser on single crystal tantalum to study the dynamic yield strength and lattice dynamics. Both techniques will be described, comparisons to the strength models made, and interpretations of the results given. Recent results from recovery experiments in shocked single crystal Ta will also be given, showing features such as the residual dislocation density and slip-twinning threshold.

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Bruce Remington
LLNL

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