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Dynamic Properties of α -Cerium BRIAN JENSEN, Los Alamos National Laboratory, JAMES ASAY, Ktech Corporation, TARIQ ASLAM, Los Alamos National Laboratory — Understanding the multiphase properties of metals remains a significant scientific challenge. Dynamic experiments are needed to examine the relevant pure phases, to measure transition kinetics, locate phase boundaries, and obtain information on other material properties such as strength. Cerium is an ideal material for such work because of the large body of static data available that describes a complex multi phase diagram at relatively moderate pressures and temperatures. The main objective of the current experiments was to obtain information on the mechanical response of cerium at shock stresses that span the α -phase and approach the melt transition. Plate impact experiments were performed to generate shock-release and re-shock loading conditions in cerium to obtain Hugoniot data, sound speed data, and estimates of strength in the shocked state. Details of the experimental methods and results will be presented.

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