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Rarefaction wave propagation and longitudinal sound velocities in shock compressed tantalum to 105 GPa ROBERT SCHARFF, PAULO RIGG, ROBERT HIXSON, Los Alamos National Laboratory — The purpose of this work is to investigate the bcc to hexagonal structural phase transition recently reported for shock compressed tantalum. Longitudinal sound velocities were obtained using a velocimetry diagnostic to record the shock and rarefaction wave arrival times at the sample/anvil interface in the reverse-ballistic plate impact geometry. This approach allows for the determination of the sound speed as a function of pressure and is sensitive to volume changes associated with phase transition behavior. The authors demonstrate that if elastic – plastic wave interactions are correctly determined, then the high pressure structural phase transition that has been previously reported is notably absent.

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