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Free Surface Temperature Measurements on Shock loaded Tin (Melting on Release) ACHIM SEIFTER, ANDREW OBST, DAVID HOLTKAMP, Los Alamos National Laboratory, DALE TURLEY, Special Technology Labopatory, Santa Barbara, MIKE FURLANETTO, JEREMY PAYTON, CARL GREEFF, Los Alamos National Laboratory — Theory predicts that over a certain range of Hugoniot pressures the free surface temperature of shock loaded tin is the ambient pressure melting temperature of 505K. In a series of high explosive driven (direct drive) shocks into tin of various thicknesses we attempted to measure this constant temperature. From the lower end (195kbar) up to the middle (250kbar) of this pressure range we could observe this temperature within the uncertainty of our measurements. From about 250kbar up to the higher end (330kbar) the measured free surface temperature was increasing with increasing Hugoniot pressure. In this paper we will describe the experimental setup, the diagnostic systems (pyrometry and Photon Doppler Velocimetry) and give possible explanations for the temperature readings higher than the predicted 505K in the upper half of the investigated pressure range.

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