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Shock-induced phase transition of Tin: experimental study with velocity and temperature measurements CAMILLE CHAUVIN, ZAKARIA BOUCHKOUR, FRÉDÉRIC SINATTI, JACQUES PETIT, CEA Gramat — To investigate polymorphic transition and melting on release of Tin, experiments under shock wave compression have been carried out from 10 GPa to 44 GPa with both velocity and temperature measurements. Interface Sn/LiF velocity has been recorded using PDV measurement technique and interface Sn/LiF temperature has been performed thnks to an optical pyrometer appropriate to detect low and high temperature (respectively under 1000 K and upper 1000 K). While PDV measurements are common and accurate, temperature remains often imprecise due to the lack of knowledge of the emissivity of the sample. Nevertheless, temperature profiles show singularities particularly during phase transition, not visible on velocity profiles. The use of an emissive layer at the interface Sn/LiF allows to estimate an accurate temperature measurement which can be compared to our numerical calculations. The profiles of velocity record and radiance record are in a good agreement in chronometry and display the polymorphic transition and the melting on release of Tin. This presentation will discuss the evidence of phase transitions on temperature measurements, the complementarity with velocity data and the advantages of an emissive layer.

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