Abstract Submitted
for the SHOCK19 Meeting of
The American Physical Society

Results on preheated shock and ramp compressed material: experiments on Tin. CAMILLE CHAUVIN, THIERRY D'ALMEIDA, CEA Gramat — We propose to study experimentally the polymorphic transition of Tin under dynamic compression from non-ambient conditions. CEA Gramat operates several gas guns for shock loading and high pulsed power (HPP) drivers dedicated to Isentropic Compression Experiments (ICE) up to several GPa. These experimental devices associated with diagnostics (velocimetry and temperature measurements) help to begin to study kinetics under dynamic transition in a more rigorous manner verified on various compression paths and contribute to constrain equation of state (EOS) models incorporated in our numerical codes. The latter is usually produced starting from ambient conditions and loading metallic materials from various non ambient initial temperatures can significantly extend the range of our studies into previously unexplored thermodynamic paths. We have improved our understanding of such phase transformations through both experimental and theoritical means. Experimental velocity measurements have long suggested kinetics is an important part of the dynamic compression response of materials undergoing phase transformations. Empirical kinetic models can in a lot of cases reproduce the experimental velocity profiles but without clearly identifying the nature of the transition.

Camille Chauvin
CEA Gramat

Date submitted: 19 Mar 2019 Electronic form version 1.4