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**Time-resolved X-ray diffraction for gas gun experiments.** CAMILLE CHAUVIN, FREDERIC ZUCCHINI, LEA TRAVICHON, JACQUES PETIT, CEA, DAM, CEG, F-46500 Gramat, France — The beta-Sn↔gamma-Sn transformation has been investigated for a long time under dynamic loadings through usual macroscopic data (velocity and temperature measurements) revealing a kinetic effects in the phase transition mechanisms. We are improving the description of this process in our multiphase EOS with growth and nucleation mechanisms but the macroscopic data are not sufficient to provide the parameters. A direct insight about the crystallographic structure will bring essential informations of the beta-Sn↔gamma-Sn coexistence domain, of the completion of the transformation. In order to improve our understanding of these mechanisms, we are developing experiments with time-resolved X-ray diffraction in Bragg geometry on gas gun experiments. Experimental and analytical developments are described in this paper. Firstly, we have studied the behavior under shock-wave propagation of different orientations of single crystals Tin. Then, we have designed an experimental set-up to success in synchronizing our X-ray source with the shock propagation and to protect our image plate. Finally, work is also in progress to obtain an image of diffraction under shock.

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