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Optimization of the overtake method for sound velocity measurements in shock compressed Sn ELI GUDINETSKY, Israeli Atomic Energy Commission, ARNON YOSEF-HAI, EITAN EIDELSTEIN, VITALY PARIS, GABI BIALOLENKER, Nuclear Research Negev, ALEX FEDOTOV-GEFEN, MEIR WERDIGER, YOSSEF HOROVITZ, AVI RAVID, Soreq Nuclear Research Center — Sound velocity measurements are useful for mapping the phase diagram of materials and for calibration of their EOS outside the principle Hugoniot. A common method is the overtake method, in which a flyer plate is accelerated towards two or more targets of different thickness. In the present work, detailed calculations were carried out in order to design optimal experiments in terms of expected uncertainties. These calculations took into account many factors: 2D effects such as edge rarefactions originating in the flyer plate, targets and the windows, EOS accuracy, thickness and diameters tolerances and error correlations. The experimental results were compared with these calculations to test the design of high accuracy experiments. The sound velocity measurements in Sn were compared to the literature.

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