

Abstract Submitted
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Versatile target assembly of explosive loading experiments for measuring sound velocity under high pressure: copper and bismuth as examples KE JIN, FENG XI, YE TAN, JUN LI, CHENGDA DAI, National Key laboratory of Shock Wave and Detonation Physics, Institute of Fluid Physics, Chinese Academy of Engineering Physics, Mianyang, China — High-pressure sound velocities along the Hugoniot are expected to be helpful in understanding shock-induced phase transition. In this paper, two kinds of versatile target assemblies of explosive loading experiments for measuring sound velocity under high pressure are presented. In the first target assembly, the direct-reverse impact technique and overtake technique are combined to obtain sound velocity data at two different shock pressures in one experiment. In the other one, the overtake technique was modified through measuring the shock wave velocity of sample, flyer velocity, and particle velocity at sample/LiF interface simultaneously, by which both sound velocity and shock Hugoniot data can be obtained independently. More important, the precision of sound velocity data is improved because we do not use shock Hugoniot parameters of sample in data processing. Shock wave experiments were performed to obtain sound velocity of copper and bismuth along Hugoniot. The obtained experimental results are compared to the previously published data, further results and implications are also discussed.

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