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**Using Characteristics Method to Infer Sound Speed in Nonsymmetric Impact and Release Experiment** XIAOMIAN HU, HAO PAN, ZI-HUI WU, Institute of Applied Physics and Computational Mathematics, Beijing — Sound speed is important to high velocity impact phenomena because it is used to deduce the shear moduli, strength and phase transition of materials at high pressure. Historically the sound speed analysis methods cannot infer the right results from the velocity-time history of a windowed-surface in the nonsymmetric impact and release experiment due to impedance mismatch between a flyer, sample and window. A characteristics method has been modified to account for the effect of the flyer/sample and sample/window interactions, thus it can be applied to the nonsymmetric impact and release experiment with only one depth of material. Synthetic analyses of the nonsymmetric impact suggest that this method can give accurate results including sound speed-particle velocity and release path at high pressure, moreover, this method also do not need to know the form of equations of state (EOS) and constitutive model of the sample. These features facilitate applying this method to infer sound speed from the velocity profile of nonsymmetric impact experiments.

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