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Using numeric simulations to inform experimental data analysis: A new method to account for characteristic bending under dynamic loading and release[1] SCOTT ALEXANDER, JUSTIN BROWN, Sandia National Laboratories — Dynamic high pressure experiments are often subject to unwanted wave interactions such as reflections from window interfaces or free surfaces where there is an impedance mismatch. In ramp loading experiments or under shock loading of materials resulting in a complex wave structure, these wave interactions can result in changes to the observed wave speeds. This effect, known as characteristic bending, can lead to significant errors in the measured material properties if not properly accounted for. Several approaches exist to correct for characteristic bending, however, they are limited to a one-to-one material response. New methodology has been developed based on control system theory to correct for characteristic bending without this limitation. By comparing simulated *in-situ* and window (or free surface) data, a transfer function is defined which captures the effects due to wave interactions. Application of this function to the experimental data results in *in-situ* profiles free from perturbations due to wave interactions. Experimental data, both with and without strong characteristic bending present, will be presented to illustrate the utility of this new approach.

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