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Technique in analyzing experimental double shock data to infer a solid-solid phase transition within cerium FRANK CHERNE, BRIAN JENSEN, Los Alamos Natl Lab, M-9 Shock and Detonation Phsyics Group — In the past decade many experiments have been performed looking at various aspects of the dynamic response of cerium metal. Recent experiments looking at off-principle hugoniot have been made and here we present an approach for interpreting the results of these double shock experiments. Double shock experiments are difficult to analyze with the potential of being nearly intractable due to the construction of the experiments. Using a simple one dimensional hydrodynamic code, calculations are performed to match the first and second shock states and the times of arrival. Upon matching velocity time history at the sample window interface, a U_s was determined from the calculation. A two state linear $U_s - u_p$ model with a transitional density switch was developed to best model the experimental data set. The best parameter set shows an inflection point around 12-13 GPa which is near where the $\alpha - \epsilon$ phase transition has been observed in static compression experiments at a temperature.

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