

Abstract Submitted  
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**Inverse Problem for PSPI Experiments** RODNEY CLIFTON, SIYUAN SONG, TONG JIAO, Brown University, SCHOOL OF ENGINEERING, BROWN UNIVERSITY TEAM — Rodney J. Clifton, Siyuan Song, Tong Jiao - /authors- -abstract- Material response at front face of target rear plate in Pressure-Shear Plate Impact (PSPI) experiments has been determined directly from measured velocity-time profiles at traction-free rear face of the target plate. Conceptual advance is the recognition that the usual forward problem for a mixed initial and boundary value problem can be reformulated as an initial value problem by a change of independent variables. Based on this reformulation the governing system of first-order, quasilinear, hyperbolic partial differential equations has been solved by a second order accurate characteristics method. While applications have been made to PSPI experiments, the approach applies equally well to the more commonly used configuration of normal impact. The new methodology requires an accurate constitutive model for the rear plate of the target assembly . When such a model is available, the inverse problem approach provides a convenient means for extending PSPI experiments into higher impact-velocity regimes where the rear plate is no longer the hard, elastic material that was envisioned in earlier development of PSPI experiments. Extensive results are presented for the cases where the sandwiching plates used in the PSPI experiments are made of tungsten carbide.

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