

Abstract Submitted
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Measuring Three-Dimensional Deformation with Surface-Imaging ORVIS MARCIA COOPER, WAYNE TROTT, JILL MILLER, Sandia National Laboratories — With growing interest in understanding heterogeneous material phenomena under shock compression and the advancement of computational methods, three-dimensional data suitable for model validation and scientific pursuit is needed. The optically recording velocity interferometer system (ORVIS) is a velocity interferometer that measures the apparent motion of a set of parallel interference fringes. Initially demonstrated for collecting one-dimensional data at a point using a streak camera and a focused laser spot, line-imaging ORVIS is a useful extension for the collection of two-dimensional data using a streak camera and a laser light sheet. We extend ORVIS operation further to a surface-imaging mode for collecting three-dimensional data using a framing camera and an expanded region of laser illumination. In surface-imaging mode, snapshots of surface velocity across a cross-sectional area are collected at regular time intervals and combined to yield the surface velocity history. Data collected with surface-imaging ORVIS applied to several model problems will be presented along with a discussion of the analysis methodology and some experimental challenges.

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