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Corresponding author (first name): Phillip
Corresponding author (MI): L.
Corresponding author (family name): Reu
University/Company: Sandia National Laboratories
Street address: PO Box 5800
Dept/Mail codes: MS 1310
City: Albuquerque
State: New Mexico
Zip/Country postal code: 87185
Country: USA
Phone: 505 284 8913
Fax: 505 845 8620
Email: plreu@sandia.gov
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ABSTRACT

Phillip L. Reu and Timothy J. Miller
 Sandia National Laboratories
 Albuquerque, NM

Experimental validation of equations for 2D DIC uncertainty quantification

Equations have been developed for predicting *a priori* matching uncertainty in two-dimensional image correlation. The uncertainty quantification (UQ) equations include terms that represent the image noise and image contrast (gradients). Experimental data using ultra-high resolution cameras, decimated to yield exact sub-pixel shifting, will be used to compare the “as predicted” uncertainty with the results obtained from commercial 2D correlation codes run on the experimentally obtained images. Image contrast and noise are varied in the images to exercise the predictive capability of the UQ equations. Results obtained will be discussed in the context of minimizing errors and estimating the resulting correlation accuracy.

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Keywords: DIC, High-speed imaging, error analysis.