Abstract Submitted
for the DFD14 Meeting of
The American Physical Society

Comparative assessment of four a-posteriori uncertainty quantification methods for PIV data PAVLOS VLACHOS, Purdue University, ANDREA SCIACCHITANO, Delft University of Technology, DOUGLAS NEAL, LaVision Inc., BARTON SMITH, SCOTT WARNER, Utah State University — Particle Image Velocimetry (PIV) is a well-established technique for the measurement of the flow velocity in a two or three dimensional domain. As in any other technique, PIV data are affected by measurement errors, defined as the difference between the measured velocity and its actual value, which is unknown. The objective of uncertainty quantification is estimating an interval that contains the (unknown) actual error magnitude with a certain probability. In the present work, four methods for the *a-posteriori* uncertainty quantification of PIV data are assessed. The methods are: the uncertainty surface method (Timmins *et al.*, 2012), the particle disparity approach (Sciacchitano *et al.*, 2013; the peak ratio approach (Charonko and Vlachos, 2013) and the correlation statistics method (Wieneke 2014). For the assessment, a dedicated experimental database of a rectangular jet flow has been produced (Neal *et al.* 2014) where a reference velocity is known with a high degree of confidence. The comparative assessment has shown strengths and weaknesses of the four uncertainty quantification methods under different flow fields and imaging conditions.

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Date submitted: 01 Aug 2014 Electronic form version 1.4