3 Component PIV Uncertainty[1] SCOTT WARNER, BARTON SMITH, Utah State University — The random uncertainty of 2-component (2C) Particle Image Velocimetry (PIV) has recently been addressed in three unique methods called the Uncertainty Surface Method (USM) from Utah State University, Image Matching (IM) method from Lavision and Delft, and correlation Signal to Noise Ration (SNR) methods from Virginia Tech. Since 3C (stereo) Particle Image Velocimetry (PIV) velocity fields are derived from two, 2C fields, random uncertainties from the 2C fields clearly propagate into the 3C field. In this work, we will demonstrate such a propagation using commercial PIV software and the USM method, although the propagation works similarly for any 2C random uncertainty method. Stereo calibration information is needed to perform this propagation. As a starting point, a pair of 2C uncertainty fields will be combined in exactly the same manner as velocity fields to form a 3C uncertainty field using commercial software. Correlated uncertainties between the components in the two 2C fields will be addressed. These results will then by compared to a more rigorous propagation, which requires access to the calibration information.

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Date submitted: 04 Aug 2013

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