Error Propagation dynamics: from PIV-based pressure reconstruction to vorticity field calculation ZHAO PAN, Department of Mechanical and Aerospace Engineering, Utah State University, JARED WHITEHEAD, Mathematics Department, Brigham Young University, GEORDIE RICHARDS, Department of Mechanical and Aerospace Engineering, Utah State University, TADD TRUSCOTT, Department of Mechanical Aerospace Engineering, Utah State University, USU TEAM, BYU TEAM — Noninvasive data from velocimetry experiments (e.g., PIV) have been used to calculate vorticity and pressure fields. However, the noise, error, or uncertainties in the PIV measurements would eventually propagate to the calculated pressure or vorticity field through reconstruction schemes. Despite the vast applications of pressure and/or vorticity field calculated from PIV measurements, studies on the error propagation from the velocity field to the reconstructed fields (PIV-pressure [1−3] and PIV-vorticity [4−5]) are few. In the current study, we break down the inherent connections between PIV-based pressure reconstruction and PIV-based vorticity calculation. The similar error propagation dynamics, which involve competition between physical properties of the flow and numerical errors from reconstruction schemes, are found in both PIV-pressure and PIV-vorticity reconstructions. [1] McClure and Yarusevych, 2017, Exp. Fluids, 58(5). [2] Pan *et al.*, 2016, Meas. Sci. Technol., 27(8). [3] Charonko *et al.*, 2010, Meas. Sci. Technol. 21(10). [4] Luff *et al.*, 1999, Exp. Fluids, 26(1). [5] Lecuona *et al.*, 1998, J. Vis., 1(2).

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