

Abstract Submitted  
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**On the Singular Value Decomposition of Measured Data** BRENDEN EPPS, Thayer School of Engineering, Dartmouth College — Singular value decomposition (SVD) is a well-known mathematical tool that can be used to decompose an ensemble of velocity field data into spatiotemporal modes that may reveal coherent flow structures. The proper orthogonal decomposition (POD) is a special case of the SVD, used when the data are uncorrelated in time (as in a turbulent flow). Although the SVD and POD have been widely used in fluid mechanics, Epps and Techet (2010, *ExpFluids* 48:355367) were among the first to consider how experimental error affects the results of the SVD. This talk revisits that paper and provides mathematically-rigorous bounds on the errors in the computed singular values and spatio-temporal mode shapes. Given experimental data with unknown error, a procedure is presented to (i) determine the root mean square measurement error and (ii) determine error bars for the singular values and vectors.

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