

Abstract Submitted  
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**Pressure Sensor-based Flow Estimation in a Wake-flow Model:  
Influence of Sensor Location.** ANDRE POPINHAK, ROBERT MARTINUZZI,  
CHRIS MORTON, University of Calgary — Estimation of an unsteady velocity field  
with remote sensors is an important tool for many technological applications and an  
integral part of flow control strategies. Many works in the current literature have  
implemented sensor-based flow estimation via pressure-velocity correlations in wake-  
flows (e.g. Hosseini et al. 2015). Using the theoretical model of von Kármán Vortex  
Street, the aim of this work is to (i) understand whether sensor placement impact  
in the performance of the estimators. (ii) What is the benefit of using Quadratic  
Stochastic Estimation (QSE) relative to Linear Stochastic Estimation? (iii) What  
is the benefit of formulating QSE into a set of orthogonal regressors? It will be  
shown that the discrete pressure information location relaxes the training method  
requirement and a proper selection of an orthogonal basis for the estimator reduces  
overfitting.

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