

Abstract Submitted  
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**Linear estimation of coherent structures in wall-bounded turbulence at  $\text{Re}_\tau = 2000$**  STEPHAN OEHLER, SIMON ILLINGWORTH, The University of Melbourne — The estimation problem for a fully-developed turbulent channel flow at  $\text{Re}_\tau = 2000$  is considered. Specifically, a Kalman filter, designed using a Navier-Stokes based linear model, is given time-resolved velocity measurements at one wall-normal height (or shear stress measurements) to estimate the time-resolved velocity field at other wall-normal heights. We apply the filter to DNS simulations and compare the estimate with the true flow fields. The results show how estimator performance is affected by measurement type, measurement location, and the size of the estimated structure. Finally, we apply the filter to the linear model itself to see if the estimator performance can be predicted.

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