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Forecasting the weather
- ensemble techniques
in probabilistic weather prediction

Comparison of a large-eddy simulation of the convective boundary layer to wind LiDAR measurements

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During the period from April 2010 to April 2011, the ongoing tower measurements at the National test station for wind turbines at Høvsøre, Denmark, have been supplemented by LiDAR measurements as part of the Tall Wind project.
A wind LiDAR has been measuring the wind profile up to 2000 m with a vertical resolution of 50 m, while an aerosol LiDAR has been used to measure the depth of the atmospheric boundary-layer.
This combination of instrumentation has provided valuable data for studying the atmospheric boundary layer.
In the present study, observations of the convective boundary layer over the flat terrain of Høvsøre are compared to a large-eddy simulation (LES) of the corresponding conditions. A day with easterly winds has been chosen for the comparison, to avoid the influence of the coastline west of the test station.
LES can presumably provide the wind profile with a higher resolution than the LiDAR measurements. The representativeness of the measured and modelled wind profiles is discussed.
The LES model used in this study is the pseudo-spectral NCAR model of Sullivan.