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Application of wind turbine energy yield data to verification of simulated wind fields

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Common datasets for wind field verification are often near-surface wind speed and wind direction data observed at the national weather stations. Those data have one major shortcoming. Measurements at near-surface heights are often disturbed by obstacles and roughness elements in their surrounding. Therefore those data represent the wind conditions in their nearest vicinity but not the wind field neither inside a model grid cell nor at larger heights. As an alternative one might think of wind turbine production data as a wind speed indicator. Hub height of wind turbines is around 100 m and a wind farm may well represent a model grid cell.

A method for processing energy yield data from wind turbines in a north eastern region in Germany for application to wind field simulations will be presented. Differences and problems when using turbine output data instead of wind speed measurements will be discussed.