Simulation of wake effects between two wind farms

SCADA data, recorded on the downstream wind farm, has been used to identify flow cases with visible clustering effects. The inflow condition is derived from a partly undisturbed wind turbine, due to lack of mast measurements. The SCADA data analysis concludes that centre of the deficit for the downstream wind farm with disturbed inflow has a distinct visible maximum deficit zone located only 5-10D downstream from the entrance. This zone, representing 20-30% speed reduction, increases and moves downstream for increasing cluster effect and is not visible outside a flow sector of 20-30°.

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The eight flow models represented in this benchmark include both RANS models, mesoscale models and engineering models. The flow cases, identified according to the wind speed level and inflow sector, have been simulated and validated with the SCADA results. The model validation concludes that all models more or less are able to predict the location and size of the deficit zone inside the downwind wind farm.

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