Mesoscale resolving high-resolution simulation of wind farms in COSMO-CLM 5

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The rapid development of offshore wind farms has raised concerns about the local environment and ecosystem. Wind farms influence the local meteorology by extracting kinetic energy from the wind field and by generating a large wake. The North Sea is one of the main regions of the world where the growth of offshore wind farms is rapidly increasing. In this study, we analyze the impact of large-scale offshore wind farms in the North Sea on local meteorology using regional climate model COSMO-CLM. For this purpose, the parametrization for wind turbine driven by Fitch et al. (2012) and Blahak et al. (2010), previously implemented in COSMO-CLM v 4.8 at KU-Leuven (Chatterjee et al. 2016), has been implemented in the latest version 5 of COSMO-CLM. Here we present the first results of COSMO-CLM long-term simulations with and without wind farms using mesoscale resolving high-resolution horizontal atmospheric grid spacing (~ 2 km).