



Towards a more accurate solar and wind power prediction by improving NWP model physics

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The growing importance and successive expansion of renewable energies raise new challenges for decision makers, economists, transmission system operators, scientists and many more. In this interdisciplinary field, the role of Numerical Weather Prediction (NWP) is to reduce the uncertainties associated with the large share of weather-dependent power sources. It is essential to optimize NWP model forecasts towards relevant atmospheric parameters. Consequently, a precise power forecast, well-timed energy trading on the stock market, and electrical grid stability can be maintained.

The research project EWeLiNE is a collaboration of the German Weather Service (DWD), the Fraunhofer Institute (IWES) and three German transmission system operators (TSOs). Together, wind and photovoltaic (PV) power forecasts shall be improved by combining optimized NWP and enhanced power forecast models. In this context, the German Weather Service aims to improve its model chain, including the ensemble forecasting system, by working on data assimilation, model physics and statistical post processing.

This presentation is focused on the identification of critical weather situations and the associated errors in the German regional NWP model COSMO-DE. Solutions on how to improve the physical parameterizations within the NWP-model are presented with the emphasis on solar power.