First Results on Numerical Weather Prediction Forecast Improvements for Renewable Energies (with emphasis on solar energy)

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Renewable energy sources are gaining importance due to reductions in the fossil and atomic industry. The operation of wind energy and photovoltaic plants is strongly dependent on the weather. This makes an optimised numerical weather prediction (NWP) forecast for renewable energy-relevant atmospheric parameters essential for the energy industry. A correct estimation of the NWP forecast quality is especially important for day ahead and intraday energy trade on the stock market and for the grid integration and stabilization. The renewable energy project EWeLiNE is a cooperation between the German Weather Service (DWD), the Fraunhofer Institute (IWES) and three German transmission system operators. Part of the EWeLiNE project is the evaluation and improvement of the critical parameters, i.e. surface solar incoming shortwave radiation and the wind speed at hub height. First verification results are shown where the NWP forecast for solar radiation and wind speed is evaluated against measurements and satellite data, respectively. Model shortcomings and possible approaches for solutions are presented with the emphasis being placed on photovoltaics.