MesoVICT final Workshop

Abstract proposal (poster preference)

Verification of wind speed ensemble predictions in complex terrain using an analog-based approach

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The analog approach is a statistical post-processing method used to generate deterministic and probabilistic forecasts. The method is based on the searching similar past numerical weather predictions (i.e. analogs) to the current prediction across several variables (i.e. predictors). The measurements corresponding to the closest analogs form the analog ensemble, with which the probability distribution of the future state of the atmosphere can be estimated. The model input can be deterministic and / or ensemble NWP forecasts in addition to the measurements.

Using only one metric for the estimation of a forecasts' skill is not sufficient enough as it does not give an overall picture. Therefore, several metrics are applied in this study. In the used verification procedure the analog-based approach in the complex Alpine terrain is evaluated by metrics such as spread-skill diagram, rank histogram and relative operating characteristic curve. Also, several summary verification measures are included, such as Brier skill score and continuous rank probability score.

The python forecast verification package *verif*, available online (https://pypi.org/project/verif), is applied here. However, it does not fully support the verification of probabilistic forecasts. Therefore, as a part of this work, the package is extended to better support probabilistic verification.

Emphasis of this work is to show that the analog-based approach provides accurate predictions while reliably quantifying the forecast uncertainty using different verification metrics. Results of the verification show that there is often no need to use all the possible input information from the ensemble predictions in the analogs-search. Using e.g. ensemble mean and spread might be enough to generate a suitable analogs ensemble. Also, using fewer predictors is computationally less demanding leading to a speed-up in post-processing. Overall, the results encourage the usage of the analog approach in an operational environment for meteorological observation sites.