



Comparative verification of wind forecasts in complex topography

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Accurate wind forecasts are important for various applications in a range of sectors including agriculture, transport, wind energy, or tourism. Additionally, warnings of strong winds are crucial to prevent damages. Forecasting wind, however, is especially tricky in complex topography such as in the Alps, as the large-scale wind field is significantly modified by local conditions. These local effects are difficult to represent even with today's high-resolution numerical weather prediction (NWP) systems. Experienced weather forecasters or statistical post-processing of coarser NWP on the other hand may provide adjusted wind forecasts that better represent local specifics at individual stations. In our study, we compare the forecast performance of wind forecasts from the Swiss NWP Ensemble-System COSMO-E with a horizontal resolution of around 2km, post-processed multi-model forecasts of the DWD MOSMIX, and manual forecasts by weather forecasters on duty. We contrast the average performance of the different forecasts with forecast performance in high-wind conditions for 27 stations in Switzerland. Several skill scores and stratification of data are used to explore the systematics in the forecast performance. Of particular interest are patterns linking the performance to topographic features and the location of the stations. In addition to this long term study, specific events, such as the wind storm Burglind at the 2nd and 3rd of January 2018, are selected to further investigate and discuss the capabilities of the corresponding systems. Based on the conclusions, recommendations are made for future developments and the added value of weather forecasters for wind predictions in Alpine locations.