EGU2020-22298
https://doi.org/10.5194/egusphere-egu2020-22298
EGU General Assembly 2020

Towards operational post-processing of probabilistic temperature forecasts at MeteoSwiss

Jan Rajczak[1], Regula Keller[1,2], Jonas Bhend[1], Christoph Spirig[1], Stephan Hemri[1], Lionel Moret[1], and Mark Liniger[1]

[1]Swiss Federal Office of Meteorology and Climatology, MeteoSwiss
[2]Center for Climate Systems Modelling, C2SM, ETH Zurich

MeteoSwiss is currently developing a post-processing suite for the territory of Switzerland. The system aims to provide optimized multi-variable (i.e. temperature, precipitation, wind and cloud cover), spatial and probabilistic predictions. The system will combine information in a seamless manner from the in-house short range and regional (COSMO-E/1) of 1 resp. 2 km resolution and the medium range ECMWF IFS NWP systems. At the example of probabilistic temperature forecasts, this contribution discusses recent advances and experiences at developing, applying and operationalizing non-homogenous Gaussian regression, also known as ensemble model output statistics (EMOS).

Over the complex terrain of Switzerland, postprocessing leads to a substantial improvement of temperature forecasts by up to 30% in terms of CRPS with respect to elevation-corrected direct model output (DMO) even by a basic EMOS only relying on DMO of temperature. Incorporating suitable predictors, such as the atmospheric boundary layer height, leads to a further gain in forecast quality. Results also show that combining high- (COSMO-E) and coarse-resolution (IFS) NWP output can not only provide a seamless medium-range forecast, but also further increase prediction skill during the time horizon when both models are available. Finally, we discuss first attempts to produce high-resolution spatial PP fields for arbitrary locations by exploiting a global EMOS framework with multiple static (e.g. geographic characteristics) and dynamic predictors derived from NWP data.