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Evaluation of seamless forecasts for severe weather warnings

Verena Bessenbacher, Jonas Bhend, Lea Beusch, **Daniele Nerini**, Colombe Siegenthaler, Christoph Spirig, and Lionel Moret

MeteoSwiss, Zürich, Switzerland (verena.bessenbacher@env.ethz.ch)

At MeteoSwiss, NWP and ML-based models are run operationally on a daily basis to provide weather forecasts and weather warnings for the general public. These forecasts come from various models that differ in lead times, initialization frequency, spatial resolution, and extents. We aim at combining those sources into a probabilistic, gridded weather forecast that is seamless in space and time. Creating a seamless forecast needs careful post-processing so as not to introduce cut-offs or unphysical behavior at the seams between the model runs. This includes using multiple forecast sources and forecast initializations (called lagged ensembles) and combining these using comprehensive blending methods.

The first minimal viable product of a seamless forecast is currently being produced at MeteoSwiss, and will soon be available to the forecasters in real time.

We evaluate the merit of these forecasts in terms of warning thresholds for rain and wind gusts. To do so, we compare reforecasts and observations from ground stations as well as rain radar observations from a set of past severe weather events over Switzerland. We benchmark the seamless forecast with individual forecast sources and post-processed products to evaluate the added value of seamlessly combining different forecast sources into one blended product. We furthermore plan to compare different methods for blending between sources soon.