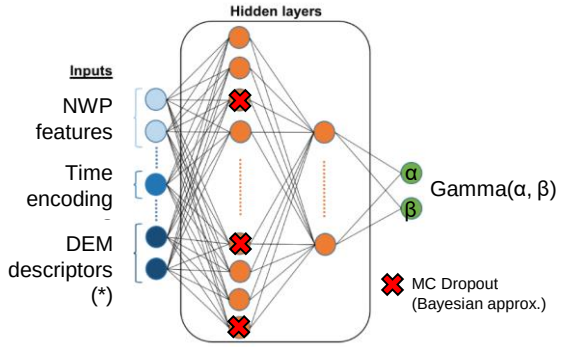
EMS2021-277

Seamless postprocessing of multi-model NWP surface wind forecasts with deep learning

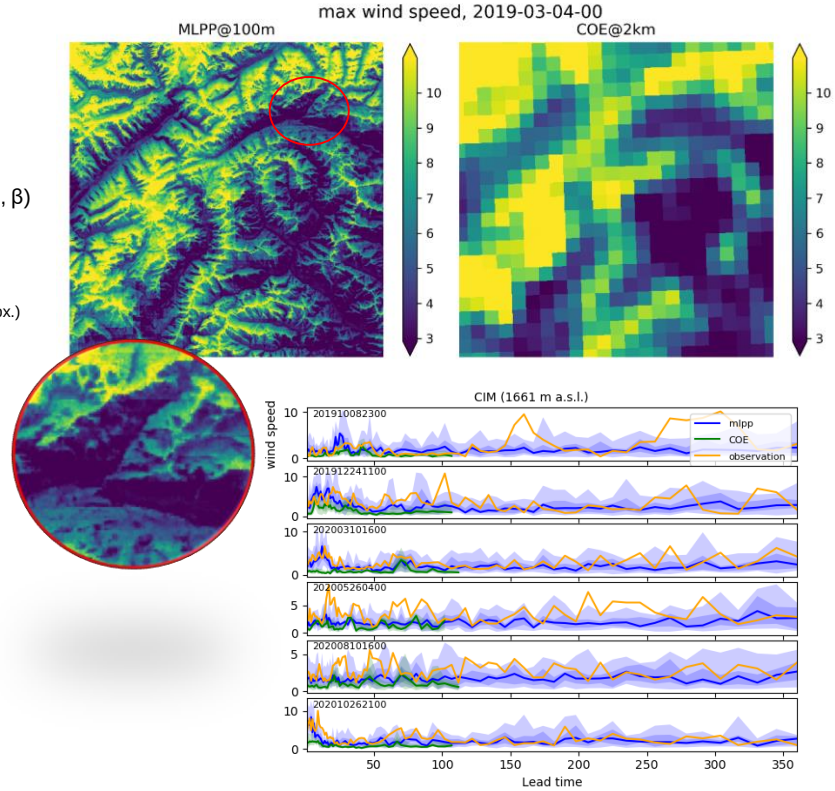


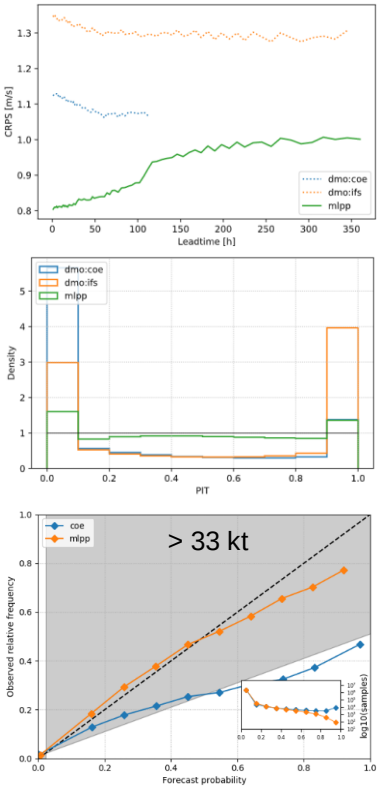
(*) https://github.com/MeteoSwiss/topo-descriptors

- Aleatoric uncertainty
- Epistemic uncertainty

NWP sources
- COSMO-1 (1km, +33h, det)
- COSMO-E (2 km, +120h, 21 memb.)
- IFS-ENS (18 km, +360h, 51)

Data split:
- train (2016-2018, 300 stations)
- val (2019, 100 stations)
- test (2020, 100 stations)





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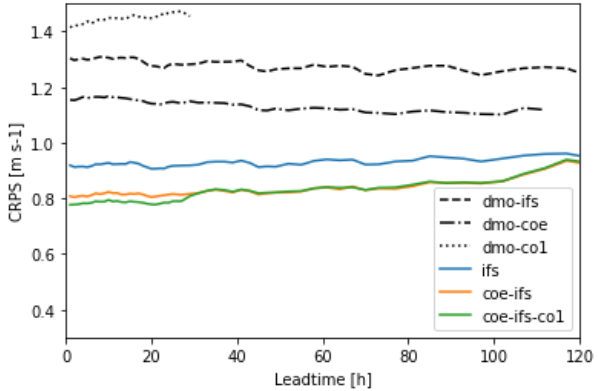
Strategy for seamless

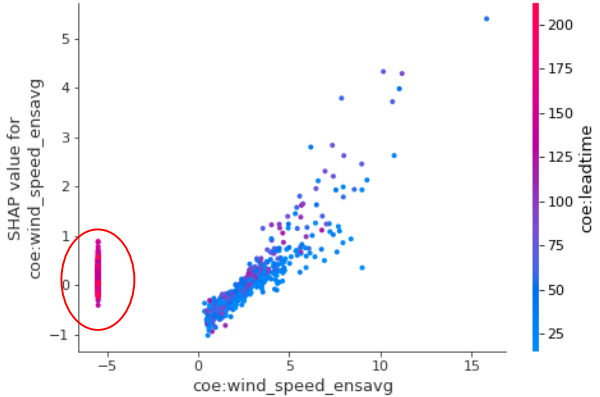
- Train one model for all NWP sources and lead times.
- Simulate model availability during training.
- Keep missing values.

→ Let the network learn from exposure to the data

In practice:

- The NWP arrival time is a random variable ~ exp(λ)
- The information «missing NWP source» is imputed with a value outside of its possible range, so that the model learns to ignore it.





SHAP: https://github.com/slundberg/shap