

ACCORD

A Consortium for COnvection-scale modelling
Research and Development

Summary of the EPS session

Henrik Feddersen, 8 Apr 2022, ACCORD ASW, Ljubljana

Family highlights

- **HIRLAM**

- First version of SPP almost ready to be operationalized
- Bias can be very sensitive to the distribution of perturbed parameters
- Computational cost is reduced by perturbing only the most important parameters and by not calling the pattern generator every time step
- EPS perturbations are not suitable for data assimilation
- If EPS and DA are separated spread is reduced, but bias characteristics are improved

Family highlights

- **LACE**

- 3 operational ensembles: A-LAEF, C-LAEF and AROME-EPS
- A-LAEF (ensemble mean) generally scores better than Aladin (2km)
- A-LAEF performed very well for record rainfall in Italy
- Common coupling files produced for C-LAEF and AROME-EPS
- Increased vertical resolution of LBCs has a slightly positive impact on AROME-EPS performance
- New surface perturbation scheme and extension of SPP scheme for C-LAEF
- C-LAEF performed very well for severe hailstorm/tornado event near Austrian/Czech border

Family highlights

- **Météo-France**

- 1.3km resolution expected operational summer 2022
- Deterministic forecast = ensemble control
- Very good verification scores for new version
- Advances on different flavours of parameter perturbations
- New research on using machine learning to enhance high-resolution and ensemble size

More on SPP

- **New convection and microphysical parameters for SPP for HarmonEPS**

- Better prediction of low visibility conditions and precipitation
- Fine tuning of the new SPP parameters still needed

URANIE

- **A platform for verification, validation and uncertainty quantification**

- Analyze uncertainty propagation, sensitivity, and much more
- Used to analyze problem of dry bias in surface perturbations in HarmonEPS
- Morris screening method identifies soil moisture as the perturbed parameter that has most impact RH2m sensitivity
- Also identifies parameters that have no impact – which was later found was a bug in the code
- It was shown how to use to optimize horizontal correlation length scale

Probabilistic post-processing

- **Visibility and cloud height at Schiphol Airport**

- Use quantile random forest (QRF) with predictors from deterministic Harmonie
- Around 20 predictors are optimal regardless of lead time
- Verification shows clear improvement over reference forecasts

Probabilistic post-processing

- **Surface wind and temperature in the main airports in Morocco**

- Select analogs to create ensemble
- 8 predictors from AROME (2.5km hor. resolution, 90 vert. levels)
- Ensemble size = 25
- Verification on independent data shows reliable 2m temperature and 10m wind speed as well as ROC curves with ROC areas ≥ 0.9