

WG4 Activities

Anastasia Bundel and WG4 team

COSMO GM 2021

WG4 activities in 2020-2021

PP AWARE
Appraisal of
HIWeather

PP MILEPOST
Machine Learning
Postprocessing
Andrzej Mazur's talk

PP C2I Task 6
Forecasters' feedback
For ICON-LAM
Daniel Rieger's talk

Potential new PPs/PTs : Preliminary ideas

PP or PT for visibility/fog forecast improvement

- Motivation: High demand from forecasters (PP C2I survey) and, in particular, at the airports
- Available experience: AWARE task 4.1:

Overview of Postprocessing Model Data for Fog Forecast (Ju. Khlestova et al. talk on 13 Sept AWARE session)

- Could be joint between WG3a and WG4 (as this task relates to microphysics and postprocessing)



Postprocessing model data for fog forecast

Julia Khlestova, Marina Shatunova,
Ekaterina Tatarinovich, Gdaly Rivin

Hydrometeorological Centre of Russia, 11-13, B.
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Visibility forecast based on ICON/COSMO results



- Liquid water content (QC)

Which one is more appropriate for
fog forecast?

QC in
microphysics
scheme

QC in
turbulence
scheme

QC in
radiation
scheme

need the analysis
and comparisons

- Number concentration of cloud droplets (N_c)

only for two-
moment
microphysics

Possible task content

- To study interrelationships between two-moment microphysics scheme, turbulence scheme, and radiation scheme
- To **correct the forecast of liquid water content** based on this study
- To **use the improved liquid water content in postprocessing**, that is to calculate the radiation attenuation coefficient β and visibility using

$$VIS = \frac{\ln\left(\frac{1}{\varepsilon}\right)}{\beta_{\lambda}}$$

PP/PT for understanding the causes of model success and failure

PP for understanding the cases of model success and especially model failure

- From WG4 Guidelines (http://www.cosmo-model.org/content/consortium/reports/WG4_Guidelines_2021.pdf):
- “This would require that some cases from the WG4 collection are rerun by different services (it is important to look if different model versions give consistent results in particular cases of failure or success). Results from those runs should then be thoroughly analysed in order to understand why the NWP model fails/succeeds in the situation in question. Sensitivity tests should be performed (but physical ideas and “working hypotheses” should be formulated first). Such a PP/PT would require close collaboration of WG4 with the physics and verification people”

One of the first COSMO PPs:



PP QPF led by M.Arpagaus, finished in 2007

- **Priority Project "QPF"**
Tackle deficiencies in quantitative precipitation forecasts
 - <http://www.cosmo-model.org/content/tasks/pastProjects/qpf/default.htm>
 - QPF final report
http://www.cosmo-model.org/content/tasks/pastProjects/qpf/qpf_finalReport.pdf
-
- **A set of test cases was selected (mainly stratiform overestimation, and convective underestimation)**
 - **A set of sensitivity studies concerning initial conditions, numerics, and model physics has been prepared (about 700 experiments)**
 - **The focus was on large scale over- or underestimation of QPF. Problems of wrong small-scale localization or wrong temporal simulation are not looked at**

Such a PP on the new stage?

- Mainly for ICON-LAM
- High-resolution model versions -> errors in localization and timing
- **Probably, to begin with a short task selecting some cases on a common basis and to try to understand the physical idea for a failure**
- Such a PP/PT would require close collaboration of WG4 with the physics and verification people

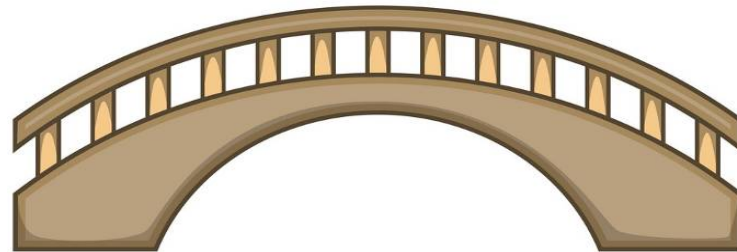
PP C2I follow-on PT – in Daniel Reiger’s talk

- Forecasters’ feedbacks as more members begin operational providing with ICON-LAM
- Updated forecaster feedback
- Comparisons of objective verification and forecasters’ subjective evaluation

To make evaluation by forecasters a continuous activity? Within SPRT, e.g.

- It can be useful to bring to the modellers the opinion of the forecasters and the issues they are facing

Forecasters



Modellers



To make evaluation by forecasters a continuous activity? Within SPRT, e.g.

- It can be useful to bring to the modellers the opinion of the forecasters and the issues they are facing



But! Commitment of the forecasters is essential!