

COSMO Users Seminar - WG5/INSPECT Session

Date: 10.03.2016

Place: Offenbach, DWD headquaters, Germany

Participants:

Anastasia Bundel-AB (RHM), Andrea Montani-AM (ARPA-SIMC), Dimitra Boucouvala-DB (HNMS), Felix Fundel-FF (DWD), Flora Gofa-FG (HNMS), Joanna Linkowska-JL (IMGW-PIB), Maria Stefania Tesini-MST (ARPA-SIMC), Massimo Milelli-MM (ARPA-PT), Pirmin Kaufmann-PK (MCH)

Minutes: A. Bundel and F.Gofa

10.3.2016, morning: INSPECT session

AB and FG made a presentation about the INSPECT status. A common discussion on open issues in each task took place during the presentation.

It was stressed that the analysis of MesoVICT cases is of high priority for INSPECT as the common framework of experiments should facilitate the study of applicability of different spatial methods depending on synoptic situations, region, important forecast attributes, etc.

TASK 1: Reruns of deterministic and ensemble COSMO high-resolution forecasts and ECMWF-EPS for MesoVICT test cases are carried out within Task 1. ECMWF-EPS will provide initial and boundary conditions for COSMO ensembles of higher resolution. The 25-km resolution ECMWF-EPS reruns are already made by AM for the 1st and 2nd MesoVICT test cases. A discussion followed as to how to provide a free access to these data. FG said that at present, there is an agreement with COMET to use <u>ftp.meteam.it</u> server as a WG5 repository with model and observed data and software developed within WG5 projects. However, it is not opened for external users. At the same time, Task 1 reruns should be available to the whole MesoVICT community. FG said that in the new COSMO server that will be bought, WG5 repository could be hosted. AB said that a limited password protected access can be also provided by RHM.

[Decision] The <u>ftp.meteam.it</u> will be (for the time being) the main storage place. ECMWF-EPS initial conditions can be temporarily put there. Furthermore, all datasets described as deliverables in Task1, need to be available on WG5 repository COSMO-1 rerun for the 1st MesoVICT case is made by MCH and uploaded to <u>ftp.meteoam.it</u>. A discussion followed what will be more useful for the project: COSMO-1 reruns for more cases or COSMO-E reruns, as MCH cannot provide both.

[Decision] The deterministic COSMO-1 reruns of additional cases are more valuable as COSMO-Ru2-EPS reruns are planned, and thus, a chain of COSMO ensembles of different resolutions will be already available.

TASK2: Task 2.a includes a preparation of a Policy document on the Requirements for model output and measurement data formats for Verification Tools, according to the STC decision. It was decided that such a Policy must contain all the data format requirements of verification tools used in INSPECT (VAST and SpatialVX) and examples of the preprocessing procedures for both forecast and observation datasets. Recommendations for additional features in the existing COSMO preprocessing tools should be given according to the needs of verification software. The main observation types used for the spatial methods (high-density station network analyses. radar fields, satellite data, and merged datasets) should be listed. Currently involved members in Task 2.a are HNMS, RHM, and IMGW-PIB but other members can also participate. Documents should be ready by the end of May. Task 2.b includes development of scripts for the most used spatial methods.

[Reminder] All deliverables in Task2b need to be available on WG5 repository with accompanying Readme files with basic explanation (following the deadline of the Task).

Task3: Includes the application of spatial methods for deterministic forecasts. The following presentations were made within this task:

- J. Linkowska "Application of object-based MODE and CRA methods for precipitation in Poland". It was shown that the best object matching is achieved using the matching criterion of centroid distance between the two objects less than the average area of the objects. Different CRA and MODE scores were demonstrated. The technology is quasi-operational. There is a plan is to apply these algorithms to MesoVICT cases.

- D. Boucouvala "SAL: Feature based verification measure". Results from two SAL packages were estimated, which is very important for implementation into practice. It was shown that the results differ slightly, because it's impossible to set up identical parameters in both packages. However, these differences are negligible, as the author of one of the packages states.

- A. Bundel «Experiments on precipitation object matching in the Sochi region". Different matching functions were tried for 1h precipitation objects identified using a threshold of 1 mm/h with convolution smoothing. Experiments were carried out during the Sochi-2014 Olympics evaluation period (15 Jan-15Mar 2014). It was shown that a function enabling cutting off too small objects (less than a certain number of grid points) proved very useful. Some conclusions about the behavior of different merging and matching functions were given. A conclusion about the difficult choice of the best function in the complex relief was made. Experiments will be continued and transferred to MesoVICT data.

It was noted by FG and AB that the software developed within Tasks 2 and 3 must be uploaded to the WG5 repository. MST notified that the DIST method couldn't be shared at present because of the specificity of datasets used.

The participation of ARPA-PT in Task3 was discussed with MM.

[Decision] A videoconference will be arranged with ARPA-PT and INSPECT project leaders to explore the possibilities of their participation over the next months.

Task 4: The application of spatial methods to ensembles is delayed. During the common discussion it was stressed by FF and AM that this approach is difficult and relatively new and quite few works exist. However, the preparation work has begun so that this task could be executed later.

FG noted the importance of cooperation of all the participants, especially in the second half of the project, when the experience gained will be generalized to write the Guidelines for application of spatial methods within COSMO consortium. To facilitate this, a short paper should be prepared as a deliverable of each subtask under Tasks 3 and 4 and will be exchanged among the project participants.

[Decision] Documents to describe main findings of each method applied in Tasks 3,4 in relation with Task5 objectives, to be provided by Tasks 3-4 participants.

AB noted that the communication via e-mail list is encouraged. Up to now the exchange of experience was mainly done by personal communication.

AB asked the participants if substantial changes to INSPECT plan were needed, for example, removal of some subtasks.

[Decision] No tasks or subtasks will be removed, but the extent of participation of some institutes will be changed. PK said that MCH will not be able to perform an experiment with ensemble data at present due to the lack of human resources.

The possibility to extend INSPECT PP (at least until September 2017) was discussed, as some tasks are delayed. This need will be reevaluated during GM2016 according to the status of the Task work.

Finally, the possibility to organize an INSPECT side meeting during the upcoming MesoVICT meeting in Bologna was discussed; AM said that the dates of the latter will be 21-23 September 2016.

[Decision] An official announcement of the respective INSPECT meeting during MesoVICT meeting will be sent by the PL in due time.

10.3.2016, afternoon: WG5 session (with the participation of WG7)

WG5 session was devoted to the presentation by FF of the DWD Feedback File based verification software. FF gave an overview of the Rfdbk (R interface) software, the objectives, the architecture and the future possibilities.

Feedback files (in NetCDF format) exist for all observation types used in data assimilation (SYNOP, TEMP, AMV, AIREP, GPSRO, SCATT,...) The advantage of using feedback files is calculation time economy because matching forecasts and observations is already done and thorough quality control. Feedback files are generated by MEC package (also DWD development) during the data assimilation or in a stand-alone mode. There are some limitations to this approach, in particular, an external data preprocessing is needed for conditional verification. Verification of some meteorological variables (precipitation, wind gusts, max and min temperature) is absent at present in Rfdbk, but the work is being done to include them. R Shiny web server is used for visualization. FF welcomed the participation of other members in the development of package functionality.

Following that, PK presented the results of an assessment that was performed of this package on upper air verification at MCH.