



# SPM Overview

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**20th COSMO General Meeting, 3-7 September 2018, St. Petersburg, Russia**

# Outline

- **Last COSMO year – some key points**
- **Issues to ponder over**

# Development of NWP Test Suite

Was viewed as **”A truly pressing problem”** a year ago

- New set-up of test runs: series of forecasts, where **the soil variable run freely and are not reinitialized**, lateral b.c. from HRES ECMWF, i.c. for soil from ICON-EU
- New test periods: July 2017 and December 2017
- DP (new COSMO model version vs. reference version): 72-hr forecasts with 7 km horizontal mesh size, 48-hr forecasts with 2.8 km mesh size
- SP (new model version only): 72-hr forecasts with 7 km horizontal mesh size
- Verification with both VERSUS and new Rfdbk+MEC system

# Development of NWP Test Suite (cont'd)

## Results

- VERSUS and Rfdbk+MEC verification results are similar and lead to the same conclusions (DP runs)
- SP results are OK (some moderate problems, solutions being sought)
- Results from low-res runs (7 km mesh size) are generally better than from high-res runs (2.8 km mesh size), reasons to be found (special verification may help)
- All in all, new COSMO version 5.05 outperforms reference version 5.03

## Work in progress

- Perform hindcast runs (much work already done, results expected December 2018)
- Introduce FSS and possibly other scores

**Thanks to the Test Suite Team for good job!**

(A. Montani, F. Fundel, M. Bogdan, R. Dumitrache, F. Gofa, A. Iriza-Burca, F. Batignani, M. Milelli)

# WG4 Issues

## Results

- WG4 user survey was performed, inputs from Switzerland, Poland, Greece, Russia (common points of interest identified, incl. extending nowcasting range to about 6h, wider use of weather-dependent and spatial verification results, etc.) **Important:** all respondents are ready to share their post-processing methods with the COSMO community (possibly, after consulting their administration)
- CORSO-A report prepared, incl. guidelines for forecasters using LAM output based on Sochi-2014 experience (winter, mountainous regions, etc.)

# WG4 Issues (cont'd)

## Work in progress

- Using CORSO-A Guidelines and WG4 user survey as starting points, a preliminary plan of a PT on the Guidelines for LAM forecast users is being prepared (possible PT leader is Inna Rozinkina)
- A task (m  
summariz  
processing  
and thund

**Our WG4 Schrödinger's cat  
Is rather alive than dead**

**NB:** most ac  
and RHM; l

# Model Documentation

From SPM talk in Jerusalem (September 2017):

“As the SPM I would encourage the COSMO folks... to write and update the model documentation (oh, how many times did we talk about this?)”

- Part I. Dynamics and Numerics: updated (Michal Baldauf)
- Part V. Preprocessing: (int2lm v2.05) updated (Ulrich Blahak and Daniel Rieger)
- Part VII. User's Guide: updated (Ulrich Schättler)

# Model Documentation (cont'd)

## COSMO Technical Reports

### Published

- No. 32. Calibration of COSMO Model, Priority Project CALMO Final report
- No. 33. V.A.S.T. (Versus Additional Statistical Techniques) User Manual (v2.0)
- No. 34. COsmo Towards Ensembles at the Km-scale IN Our countries” (COTEKINO), Priority Project final report.
- No. 35. The COSMO Priority Project CORSO Final Report

### Submitted

- PP INSPECT final report
- PT CORSO-A final report

**Thanks for good job!**



# Issues to ponder about

Release of the COSMO-model version 5.05 took long time (longer than we dare admit)

Work within several PPs and PTs delayed, numerous PTs extended, considerable administrative overhead...

- Ever increasing complexity of NWP models
- Increasing resolution (a challenge, cf. our test-suite 7 km and 2.8 km test runs)
- The idea of “unified” COSMO-ICON physics was way too optimistic

**Careful planning, for both short-term and medium-term.**

# Issues (cont'd)

Transition to ICON-LAM (Consortium at a crossroad)

- Co-ordination of efforts with ICON team is crucial
- Careful drafting of PP and PT proposals (more in the SPM talk on Th)
- PP C2I is now ongoing (more in the talk of Daniel Rieger), active participation of all COSMO folks is expected

**A lot of tricky issues, incl. issues we do not foresee now.**

# Issues (cont'd)

## COSMO Newsletter

- Decreasing number of contributions
- Low interest to write even short notes to COSMO Newsletter (that decreases further in spite of efforts of COSMO people)
- The future of COSMO Newsletter is unclear

**How should we behave in the brave new world  
of Hirsch Index and Impact Factors?**

The problem is discussed by SMC and STC (incl. DOIs, co-ordination with ICON publications, etc.), no good solution so far

**Dear COSMO colleagues, please think and make suggestions!  
COSMO needs innovative ideas probably more than ever.**



**Thanks for  
your kind attention!**

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# High-Resolution Challenge

**With the increasing spatial resolution we enter the “convection-permitting” range of scales**

- Deep cumulus convection scheme is switched off (not a bad idea)
- No general consensus about the treatment of shallow convection (though COSMO researchers have promising ideas!)
- Sophisticated interplay of radiation, turbulence, microphysics (expensive solutions exist, but how to make things cheap?)
- The interaction of SGS and resolved scales is not well understood
- Frankly speaking, we do not really understand what our models actually do

**We know that something is happening here  
But we don't know what it is  
Do you?**

# Outlook

Quite some effort will (likely) go into

- development of dycores with improved conservation properties
- more intimate coupling of turbulence, microphysics, radiation and soil (including ocean and lakes) parameterization schemes
- model calibration
- development and efficient use of spatial verification methods for ensemble and deterministic forecasts
- representation of model uncertainties and development of perturbation methods for the ensemble prediction systems
- performance on the massively parallel computer architectures
- (not the least) software maintenance

**Given limited resources, priorities should be carefully set!**

# Outlook (cont'd)

As the SPM I would encourage the COSMO folks

- To think more and perform deeper analyzes, not just run the model and produce nice plots. Thinking is not a waste of time, it often helps to make progress!
- To strengthen co-operation between WGs (cf. a long WG3ab-WG5 co-operation story, not really a success story so far).
- To write and update the model documentation (oh, how many times did we talk about this?).
- To try out ICON. It is tasty! (Talks of Alexandr Kirsanov, Martin Köhler, and Michael Baldauf)

**We are on a good track, but there is still a lot to improve.**

**Enjoy your work within COSMO and the COSMO spirit!**



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