Data assimilation work in Hungary

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Alapítva: 1870

Outline

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2., Computation of a new B matrix for AROME

3., Visualization of observation database

4., Experiments with AROME RUC

5., Development of operational AROME assimilation system

6., Future plans
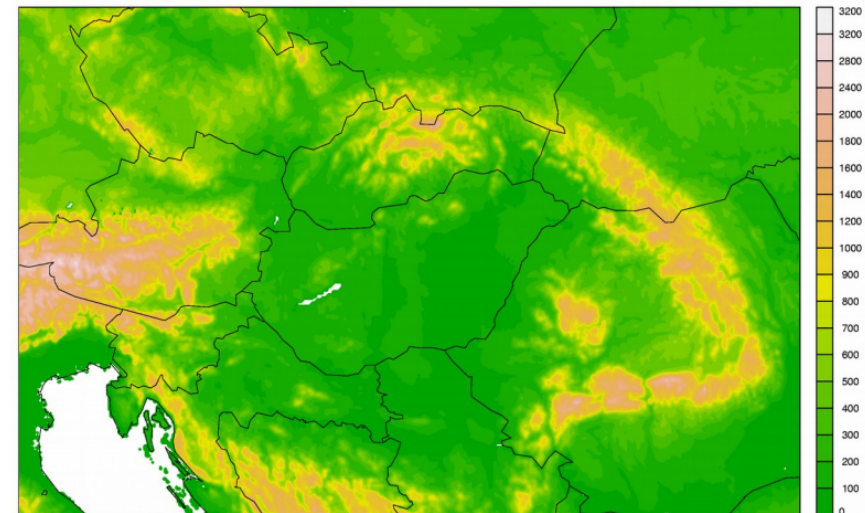
Status of operational DA systems

ALARO

- 8km horizontal, 49 vertical levels
- cy38t1_bf03 ✉ cy40t1 (ALARO-v1b)
- SMS environment
- 4 runs/day up to 60 hours
- 3 hourly coupling to IFS global
- With digital filter initialization
- Operational 3DVAR+CANARI
- 6-hour DA cycle
- Observations: SYNOP, AMDAR, TEMP, SEVIRI, Geowind AMV, NOAA-18 AMSU-A, MHS
- ALADIN EDA B matrix
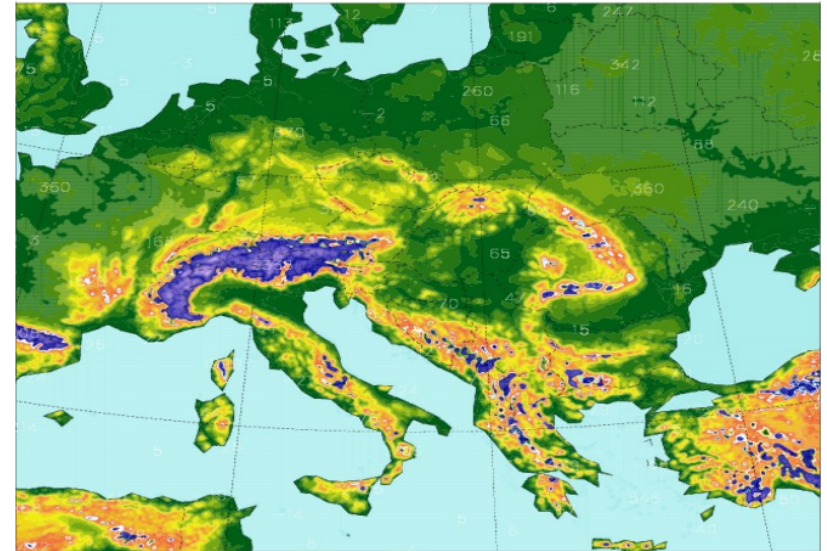
AROME

- 2.5km horizontal, 60L vertical
- cy40t1_bf05
- Script environment ✉ SMS environment
- 8 runs/day up to 48/36 hours
- 1 hourly coupling IFS global
- Without digital filter initialization
- Operational OI_main, 3DVAR
- 3-hour DA cycle
- Observations: SYNOP, AMDAR, TEMP, GNSS-ZTD
- AROME EDA B matrix

Status of operational DA systems

**New supercomputer has just arrived**

- Operational since Apr/2019

- 20 nodes

- 40 cores each

- Main goal is to run AROME-EPS

    - EDA for IC perturbations

- We tested 1hourly AROME-RUC

Computation of a new B matrix for AROME

- Because of wintertime instability (e.g. strong wind) in our operational 60 levels AROME we decided to introduce 90 levels setup, therefore we have to compute B matrix for that
- First step was spin-up B matrix calculation using dynamical adaptation based on two weeks period from each season
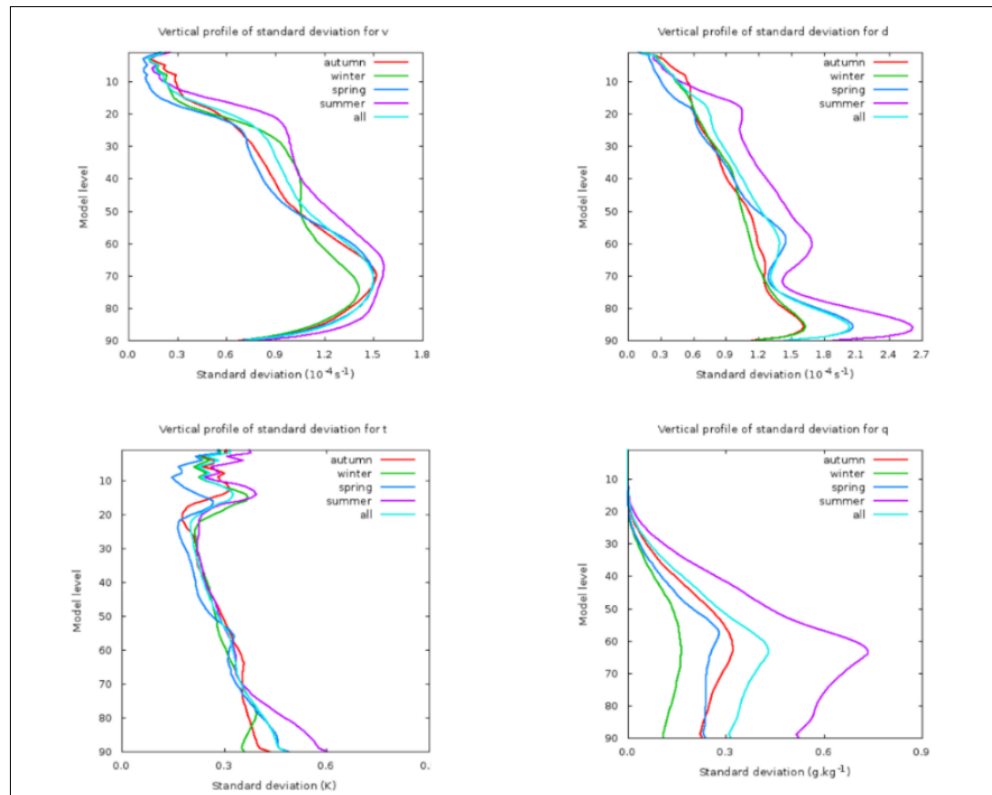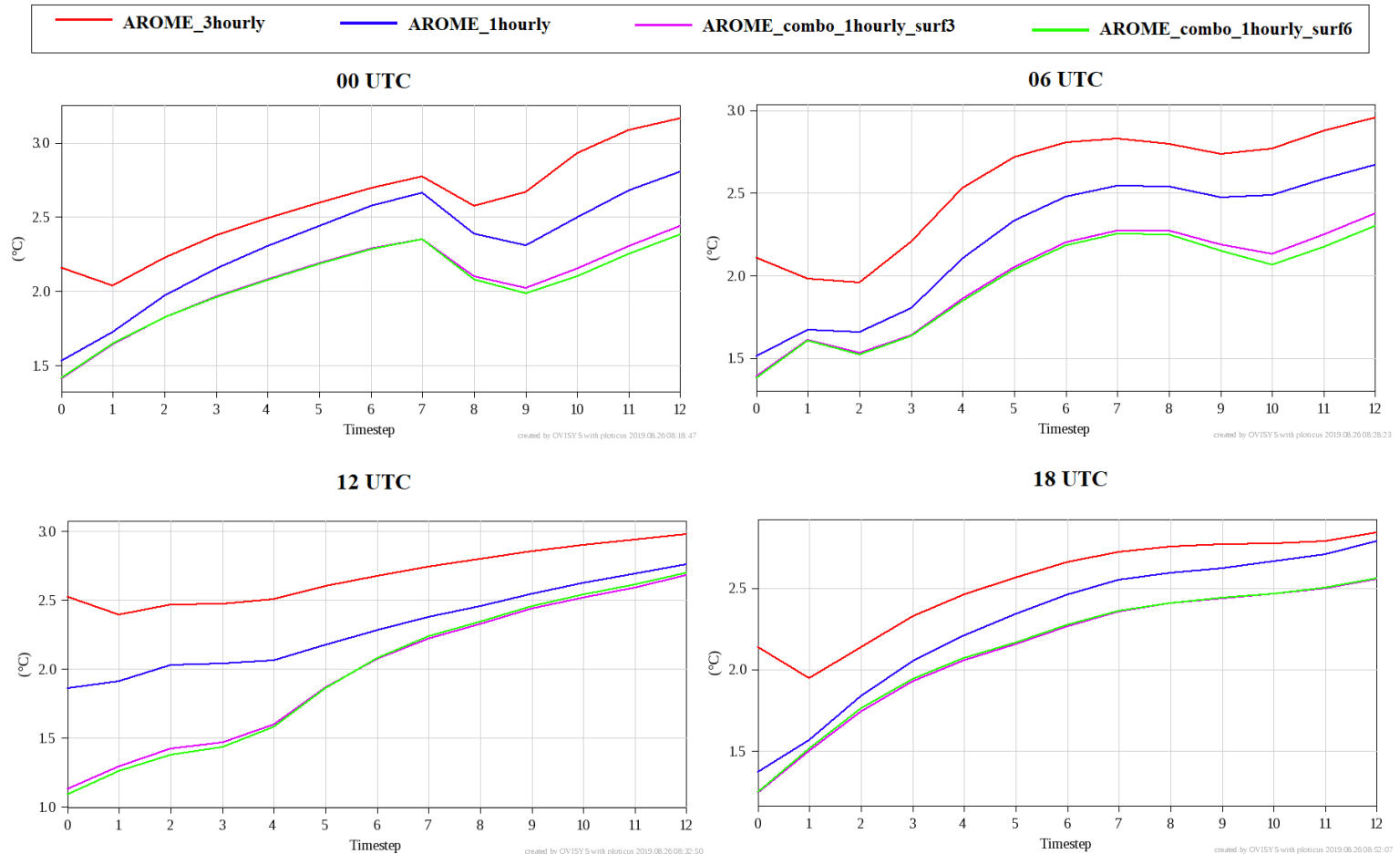
Visualization of observation database

- The goal is to compare and diagnose data entered both ODB and HDF files
  - A new script was developed from scratch to visualize reflectivity data in ODB through SQL interface
  - Second step is to get same figure from HDF files
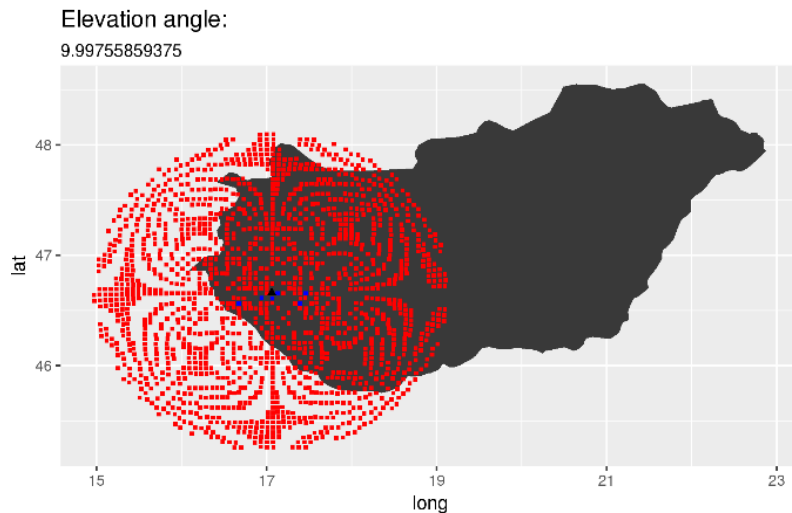
Expriments with AROME RUC

RMSE of 2m temperature in function of timestep between
08/01/2017 and 06/02/2017 for 00, 06,12,18 UTC runs

Development of operational AROME assimilation system

- Until now only +/ - 60-minute time window was used, which proved to be a bug
- The new cut-off time is 90 minutes
- Parallel experiment (AROME_ficdate_test) was executed between 04.05. and 20.05.2019, and we assume that experiment with the right ficdate settings performs better than the operational AROME (for temperature and humidity parameters)
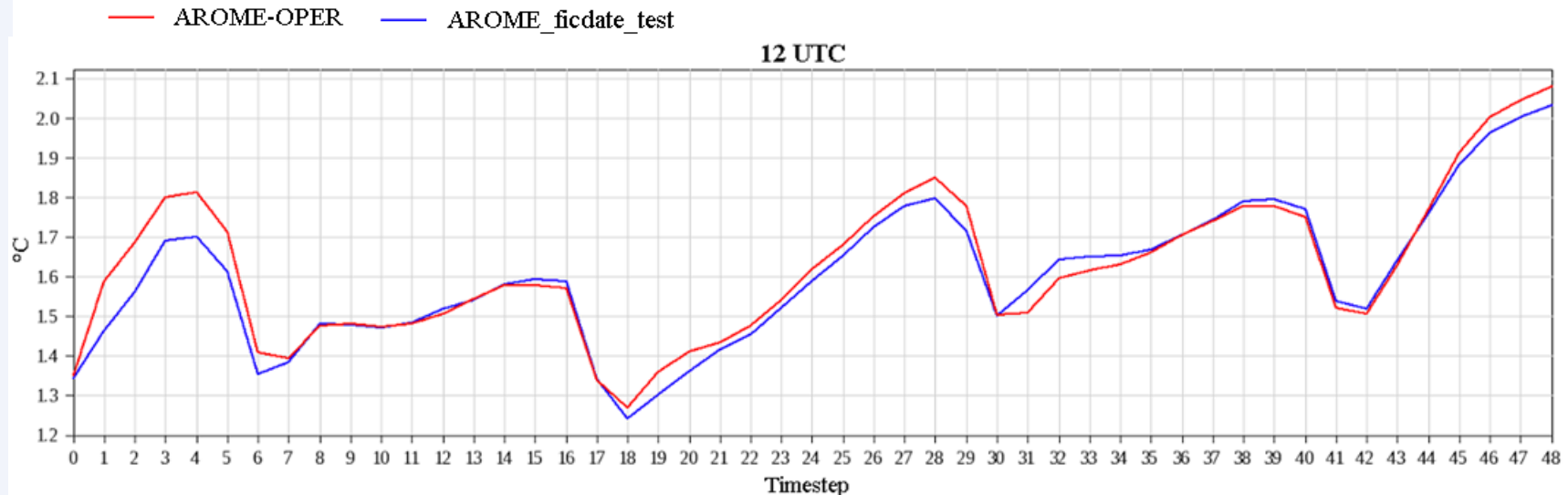
RMSE of 2m temperature in function of timestep

Future plans

- New B-matrix for operational 90 levels AROME

  (Viktória Homonnai, Katalin Radnóczi Jávorné)

- AROME 1 hourly RUC experiments

  (Anikó Várkonyi)

- MODE-S DATA assimilation

  (Viktória Homonnai)

- Assimilation of AMW data

  (Zsófia Kocsis)

- Radar data assimilation

Thank you for your attention !

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