LACE
nwp central europe

Data Assimilation Activities in Hungary

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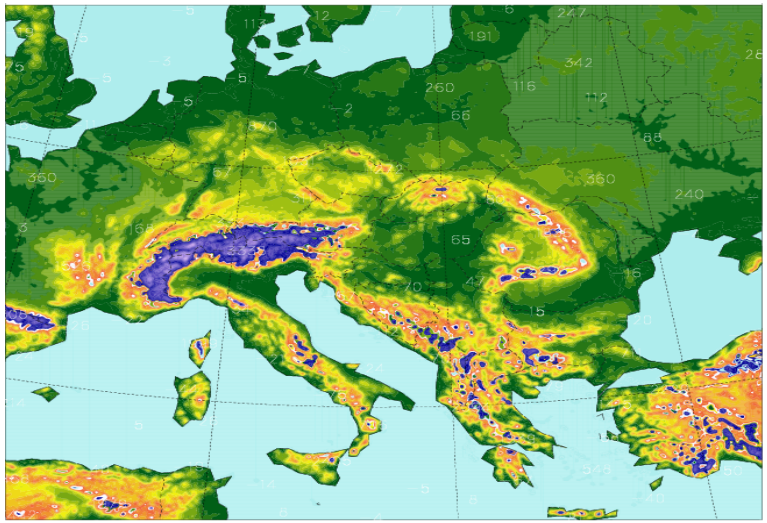
DHMZ SHMU OMSZ ZAMG ROMANIA ANM

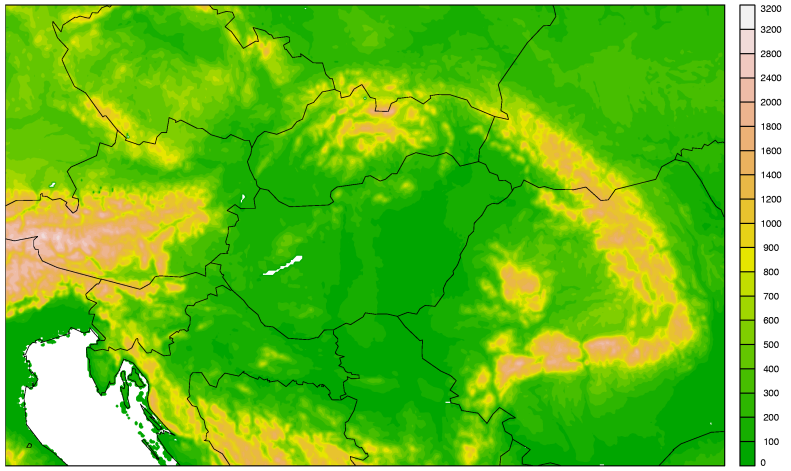
Outline

- Operational NWP and DA systems at OMSZ
- Results of new cycle (CY38t1) implementation
- AROME DA B matrix (AROME EDA)
- AROME DA observations (RADAR, AMVs)
- Surface assimilation with EKF (first steps)
- ALARO DA upgrade
- Future plans

Operational NWP systems at OMSZ



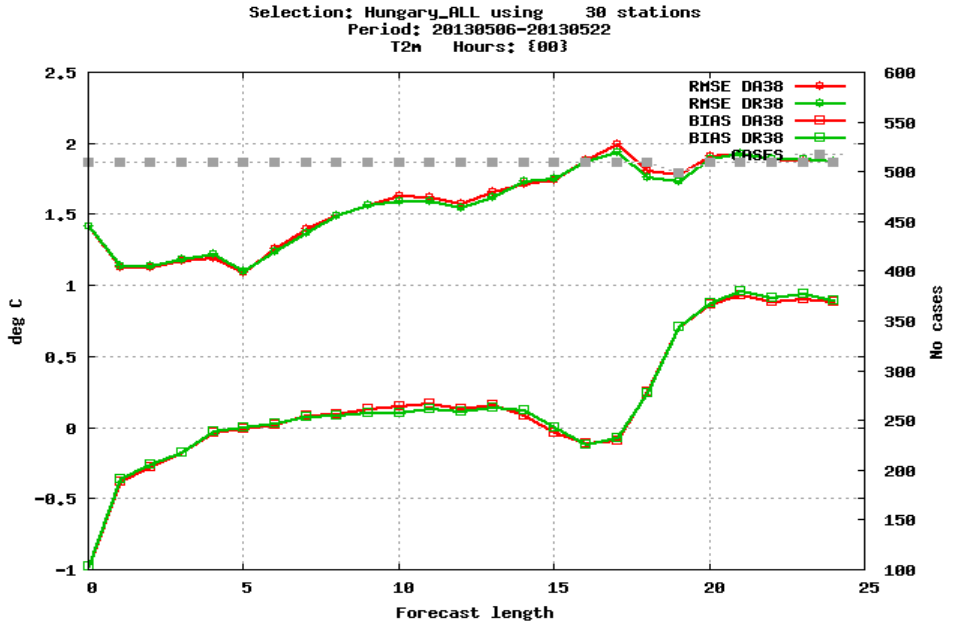
- ALARO
  - 8km mesh size, 49 levels
  - cy36t1_op2
  - 4 runs/day up to 60 hours
  - 3 hourly coupling from IFS
  - Operational 3DVAR+CANARI DA

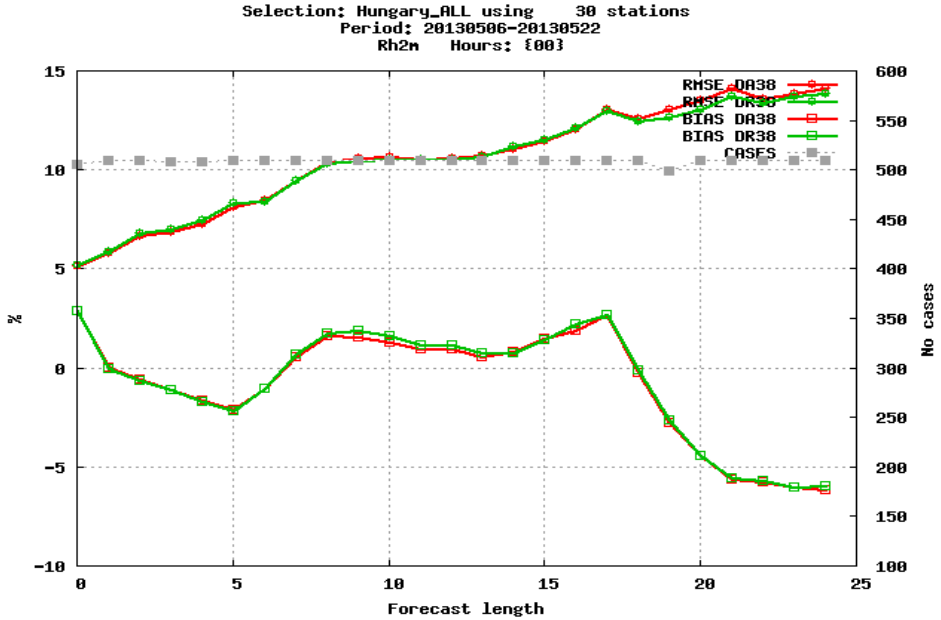


- AROME
  - 2.5km mesh size, 60 levels
  - cy38t1_bf03
  - 4 runs/days up to 48 hours
  - 1 hourly coupling from IFS
  - Operational 3DVAR RUC 3h

New cycle (CY38t1) implementation

- Comparison regarding SIGMAO and humidity treatment modifications:
  - CY38t1 with backphased settings of CY36t1 (DA38)
  - CY38t1 with export version settings (DR38)





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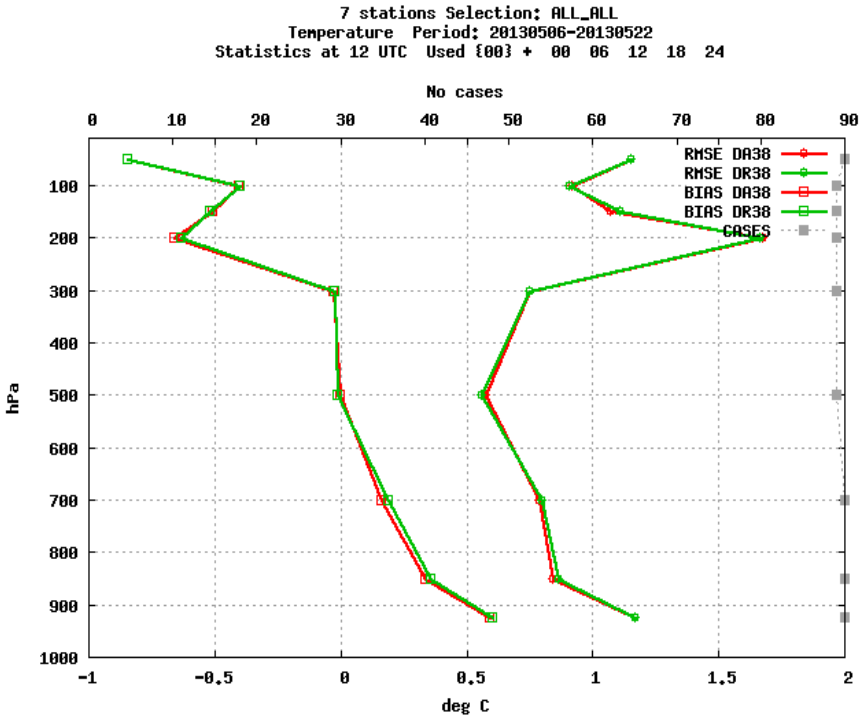
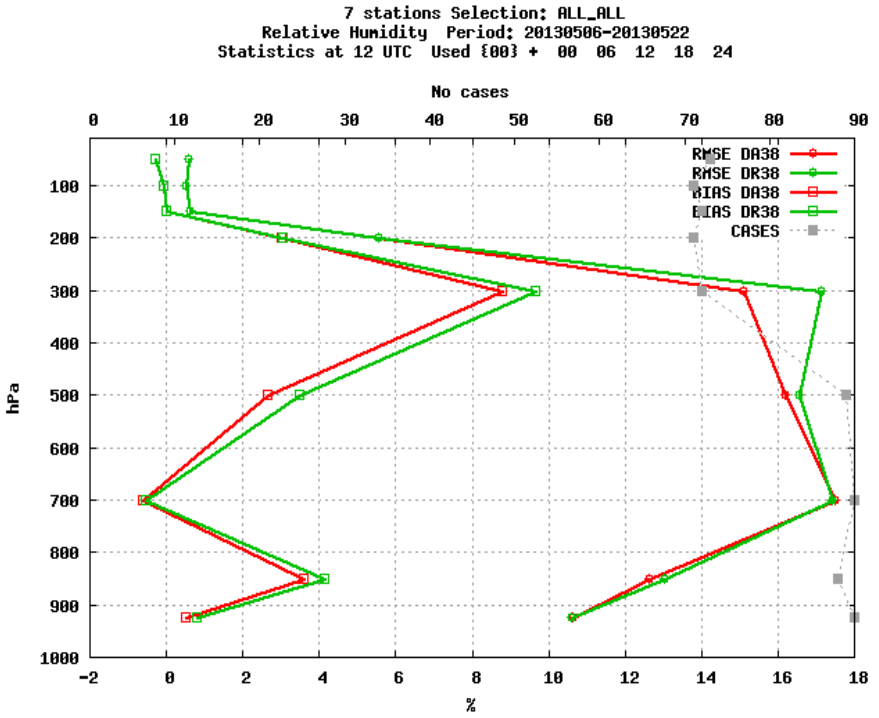
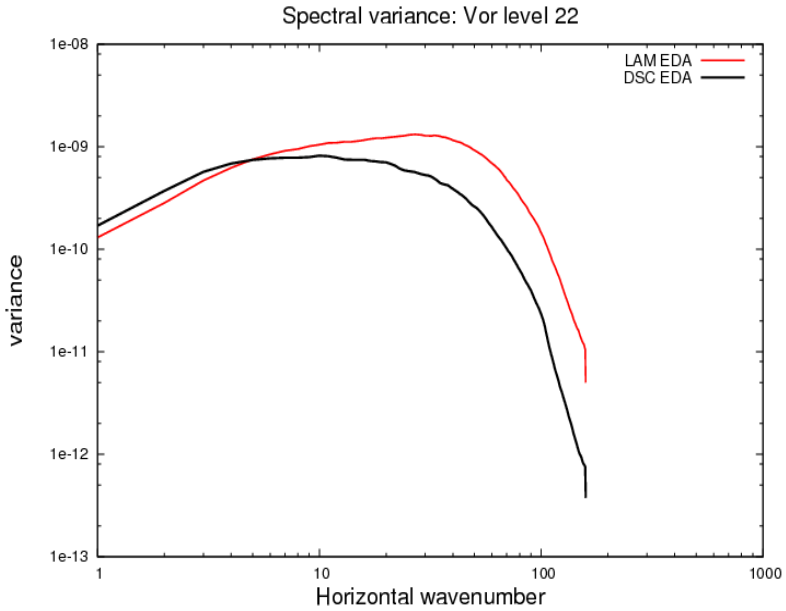


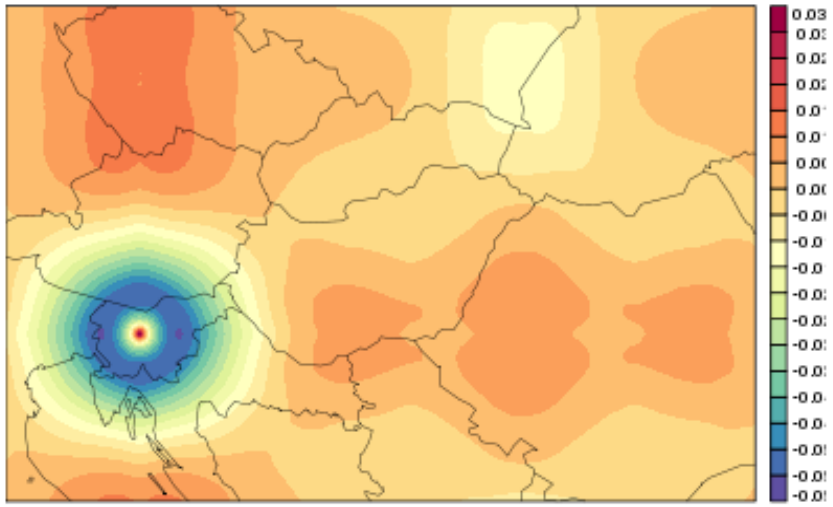


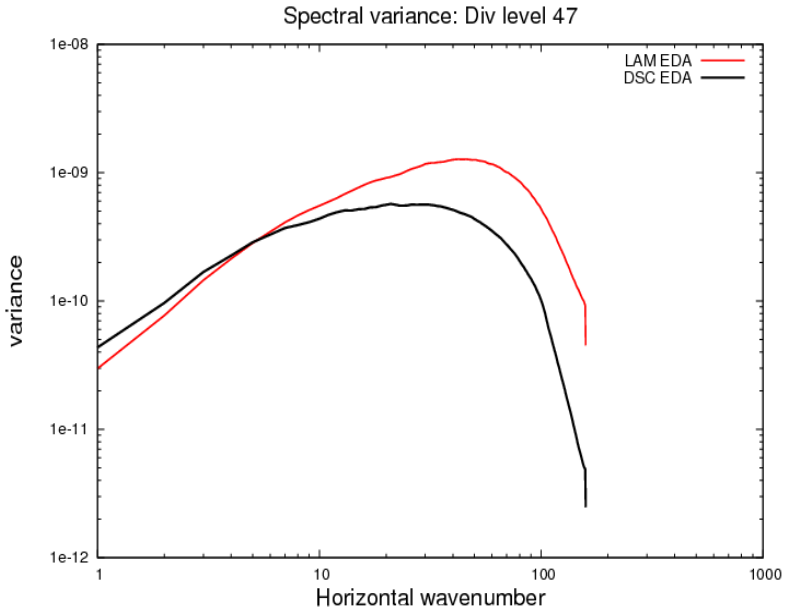
AROME EDA for AROME B matrix

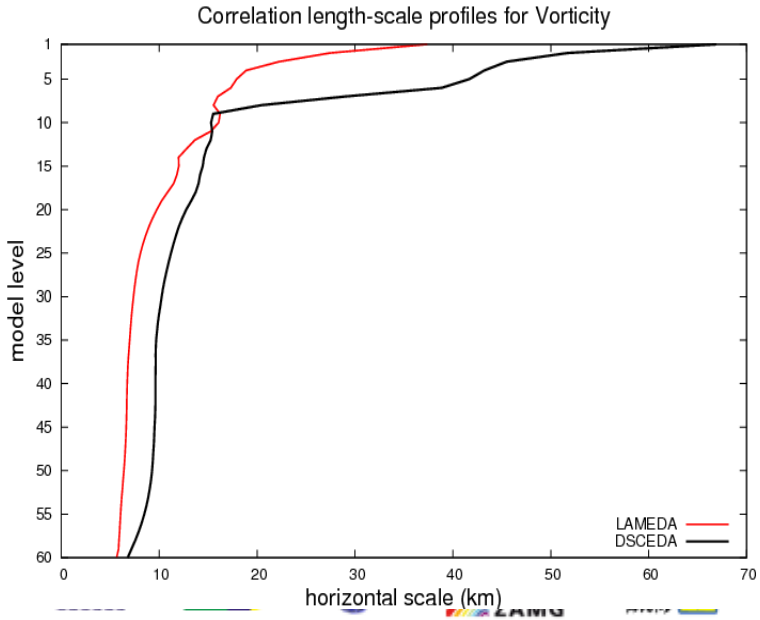
- An experimental AROME EDA was built.
  - 21 days in May-June 2014
  - 10+1 members EDA with conv. observations
  - 3-3 Forecast differences from 00 and 12UTC runs (using 4-4 members from EDA, control included)
  - sample size: 126

AROME EDA for AROME B matrix









AROME DA + RADAR refl. and dow

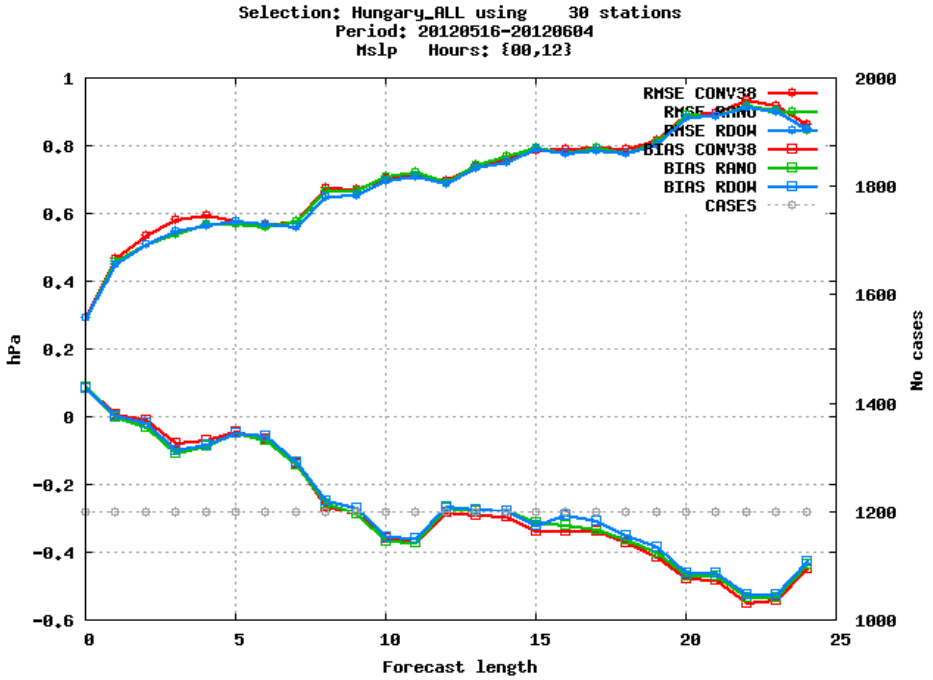
- What's new since last DAWD:
  - Hungarian RADAR reflectivity contains norain pixels (Quality indexes: 8-rain; 0-norain)
  - Velocity filter (locally applied additional quality control for radial wind)

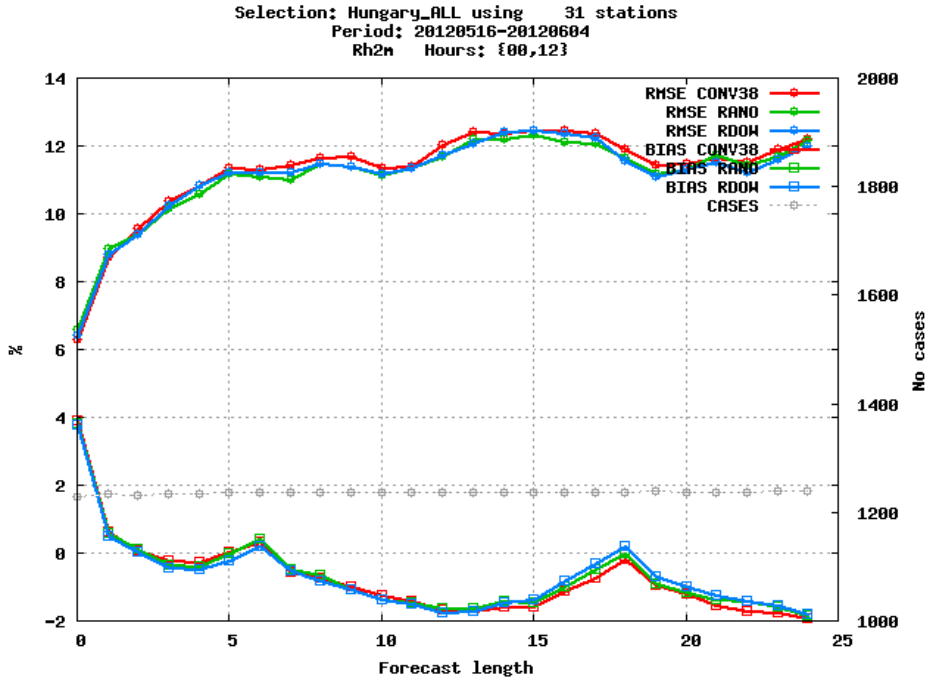
    (Quality Controls: WifiFilter, Raysmooth, Removing refl. values under 7dBz, Velocity filter)
  - Using cy38t1_bf03 for data assimilation
  - Additonal bugfixes for RADAR assimilation

    (sharing on LACE forum...)
    - inv_refl1dstat.F90
    - bator_util_mod.F90
    - bator_lectures_mod.F90

AROME DA + RADAR refl. and dow

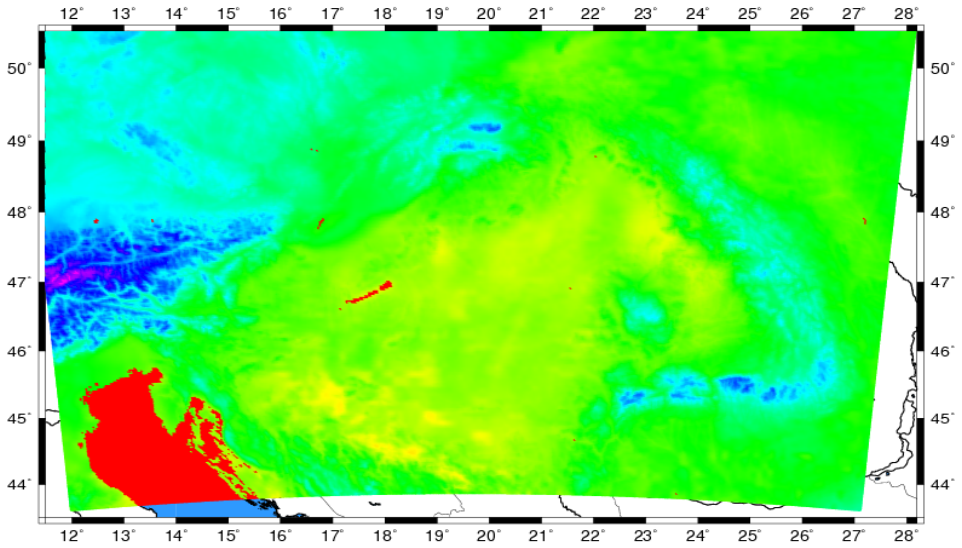
- Previously reported spin-up problems in surface scores disappeared with new data and new cycle (CY38t1).
- However RMSE-BIAS profiles (i.e. upper-air scores) and precipitation skill scores are still mixed.

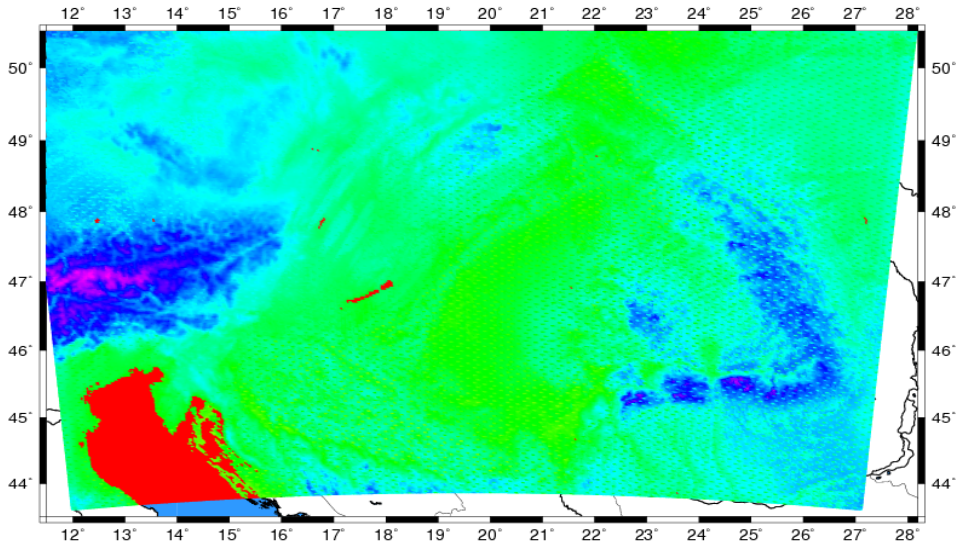




Surface Assimilation with EKF

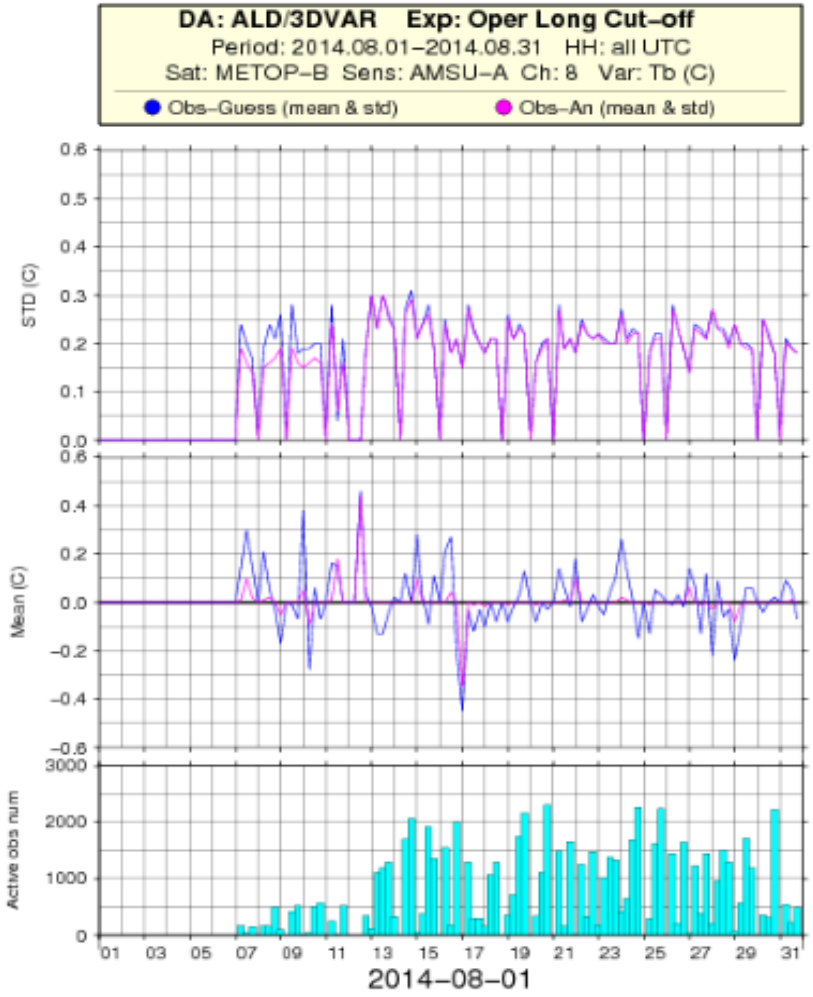
- First results using EKF in AROME surface assimilation. (Adaptation of Belgian ALARO version of EKF)
- Technical validation is ongoing, SURFEX and AROME atmospheric forcing produce noisy fields.





ALARO DA satellite radiances

- Decommission of NOAA-16 satellite
- Passive Assimilation of AMSU-A and MHS from NOAA-19, METOP-A, METOP-B



Future Plans

- AROME next parallel suite
  - New B matrix
  - OI_main for surface assimilation (?)
  - Geowind and HRW AMVs (?)
  - RADAR refl. and radial wind
  - GNSS ZTD
- AROME experiments with
  - SEVIRI radiance
  - AMSU, MHS, IASI radiance
- ALARO DA upgrade with satellite radiances
- ALARO EDA B matrix

Meteosat High Resolution Wind (HRW AMV) by NWCSAF

- NWCSAF package v2013
- PGE09 provides HRW AMVs
- Set BUFR_OUTPUT_FORMAT to EUM
- Set WIND_CHANNEL to IR108
- Modifications for Bator:
  - bator_init_mod.F90
  - bator_ecriture_mod.F90
  - Param.cfg
  - namel_bator

AROME DA + RADAR refl. and dow