Highlights and plans

Tour d'ALADIN

Highlights **AUSTRIA** 2011

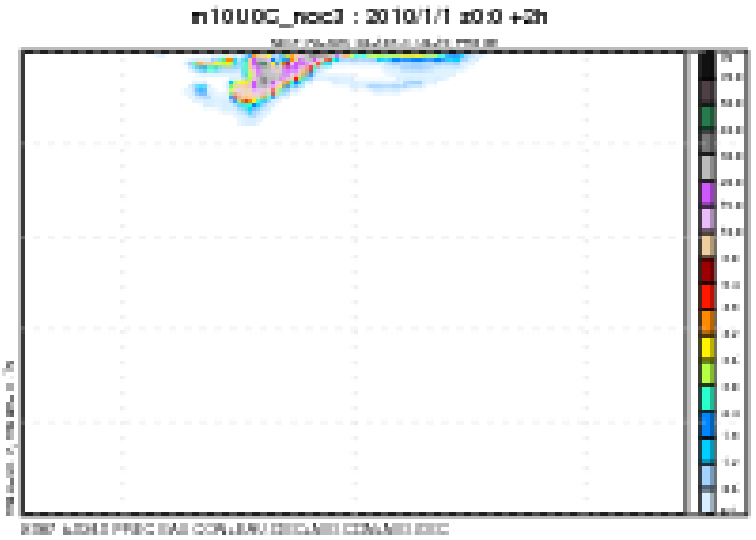
New operational ALADIN model since 03/2011:

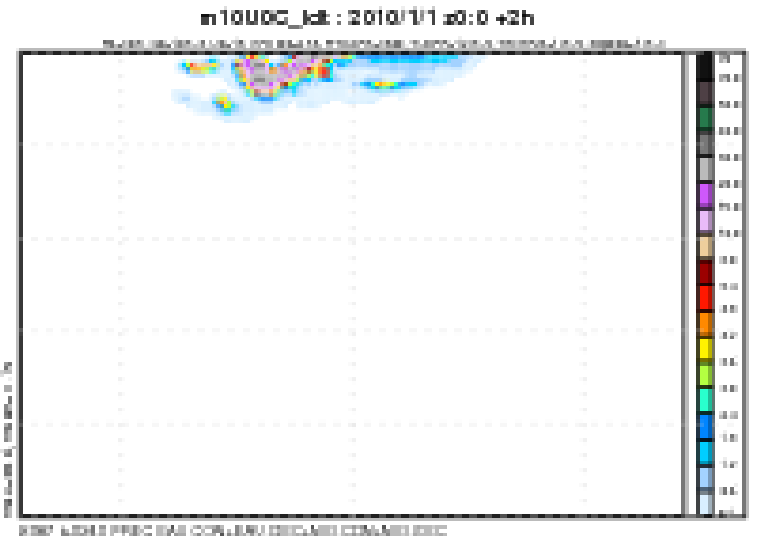
ALARO5-AUSTRIA (4.8km, coupled to IFS, …)

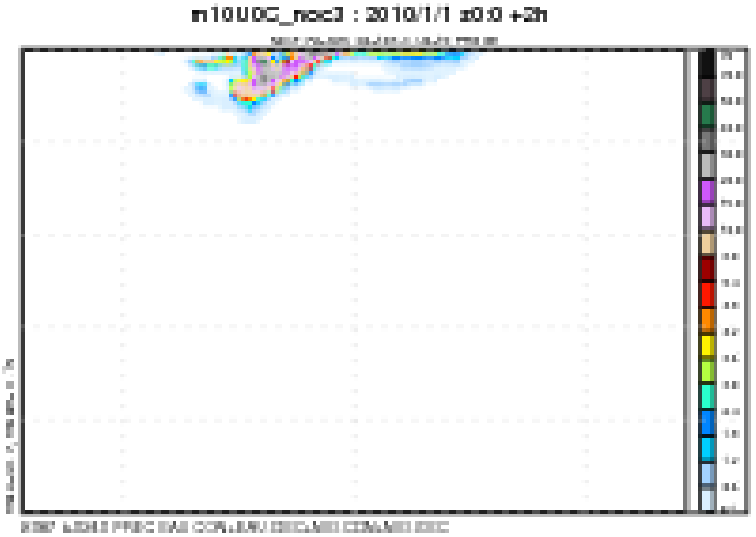
Development and operational implementation of local **data assimilation** system for ALARO5-AUSTRIA

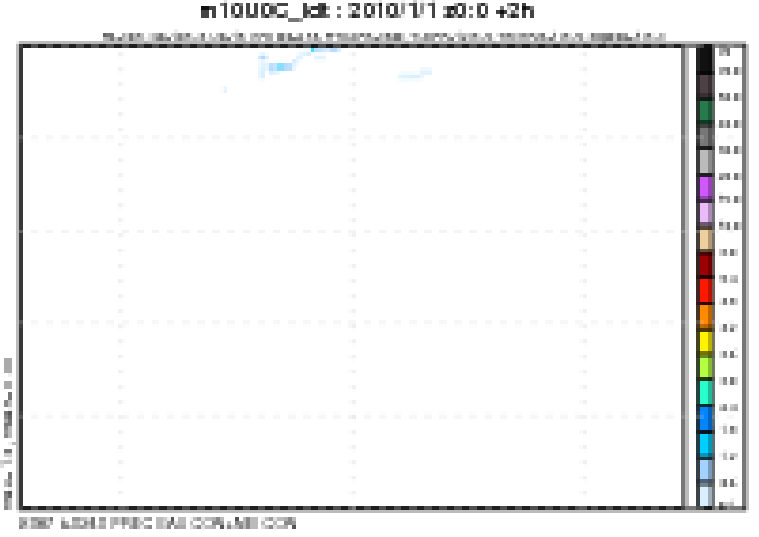
ALADIN-LAEF: Re-design of the ensemble forecast system with special emphasis on convection (higher resolution, new multiphysics, stochastic physics, ...) ongoing

Be: deep convection in the gray zone: CSU (1 km)



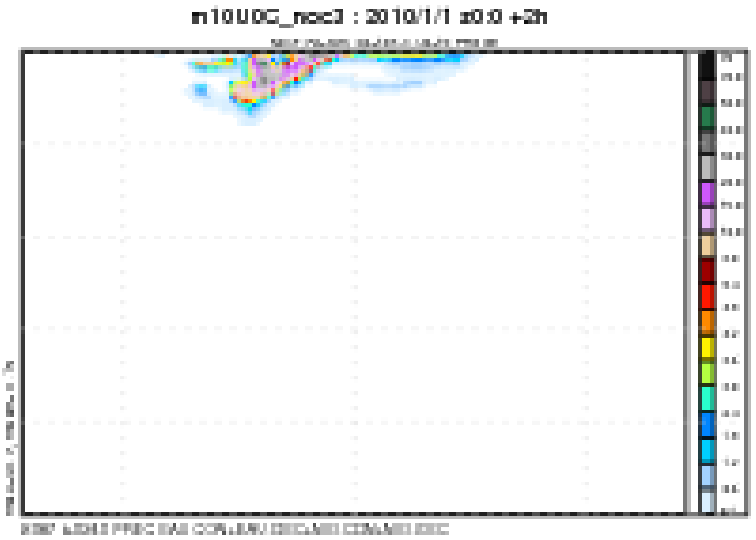


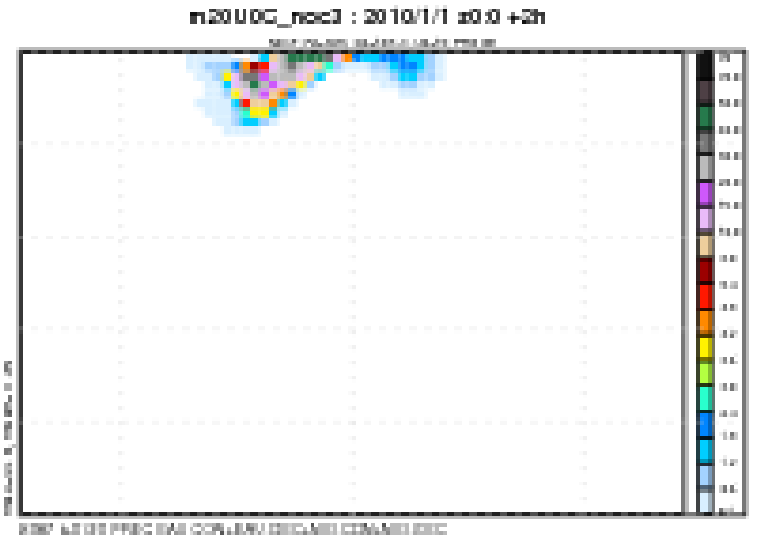


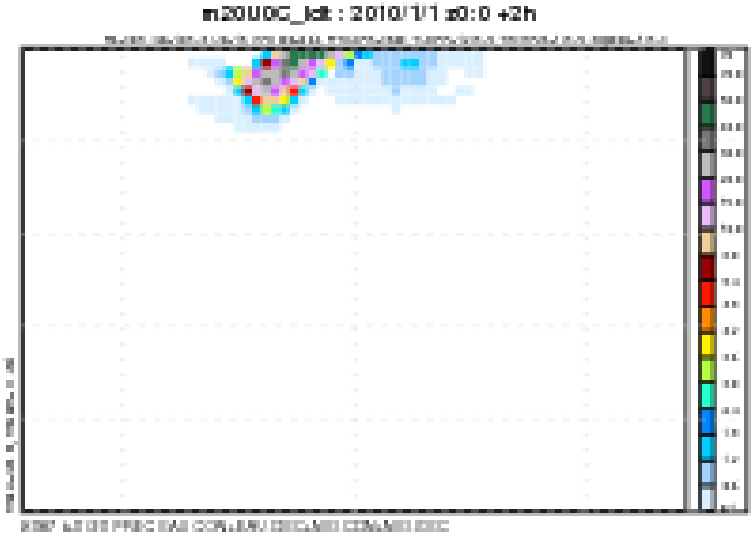


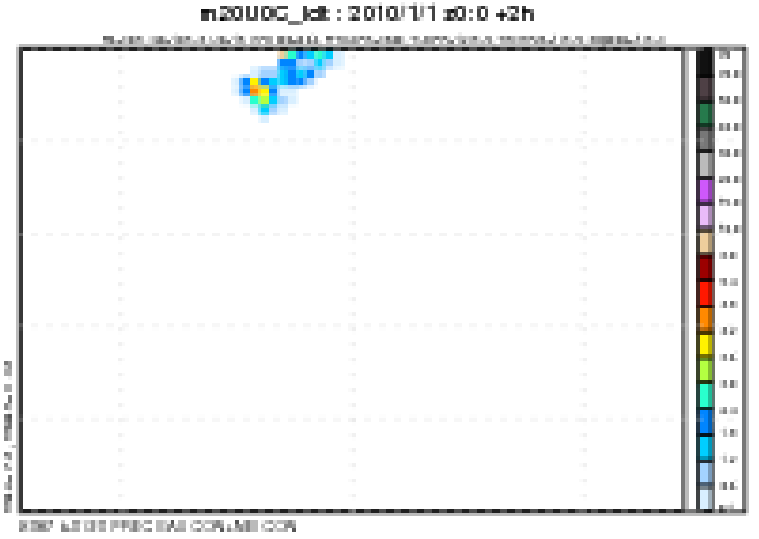
Work of L. Gerard

Deep convection in the gray zone: CSU (2 km)

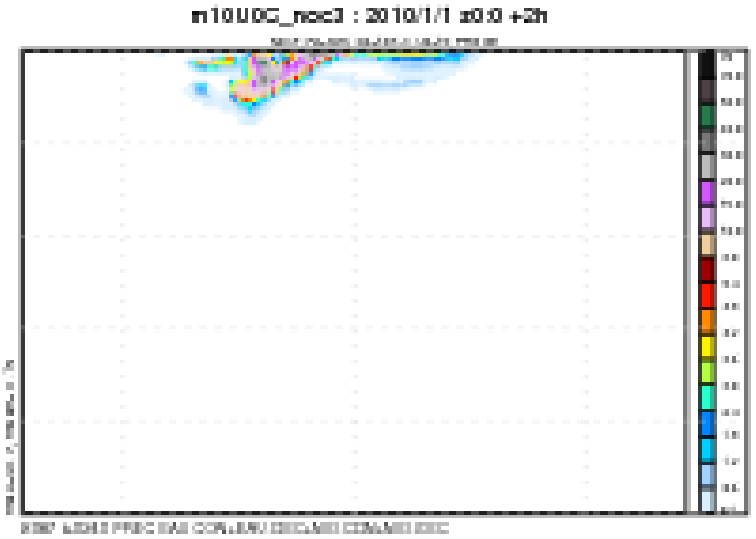


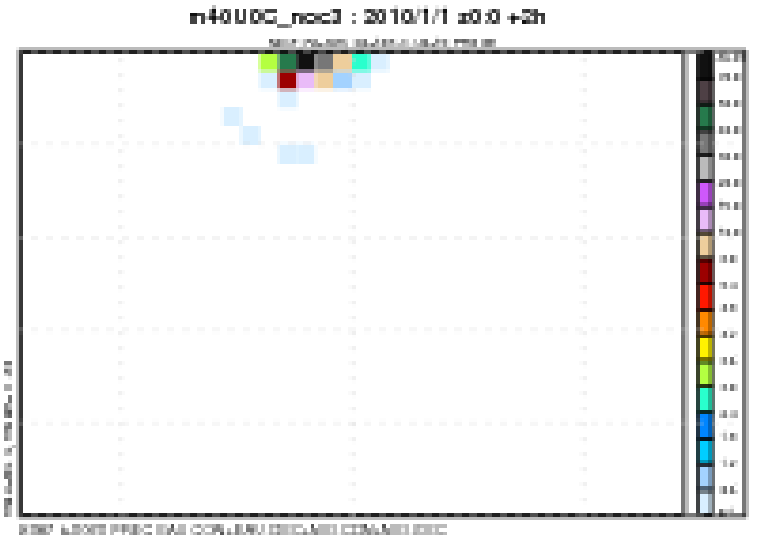


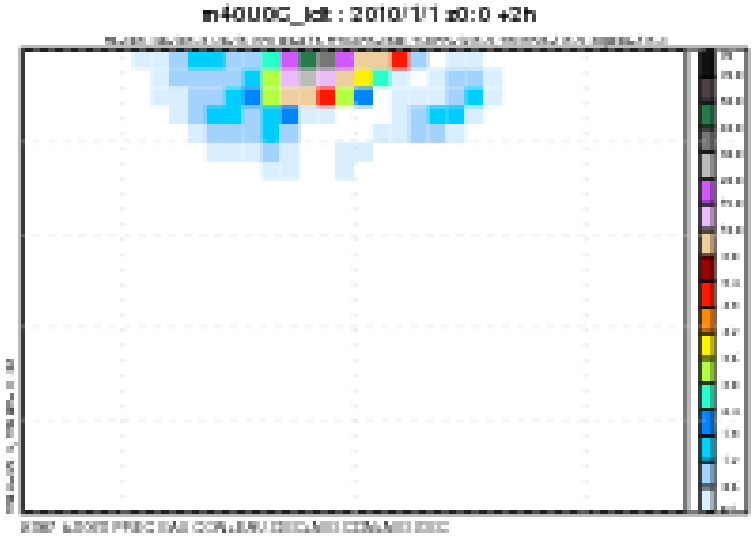


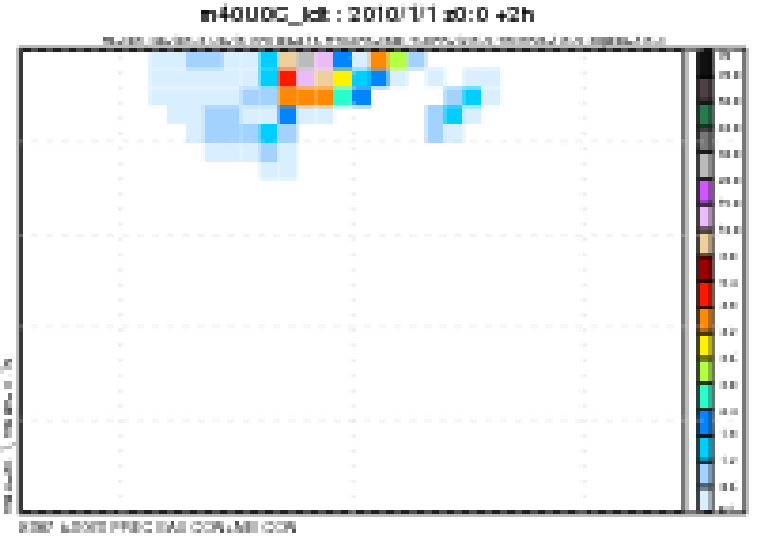


Deep convection in the gray zone: CSU (4 km)

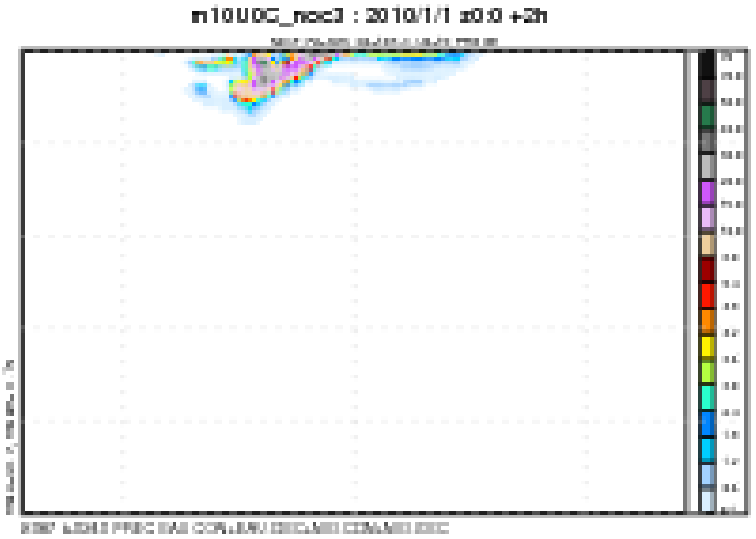


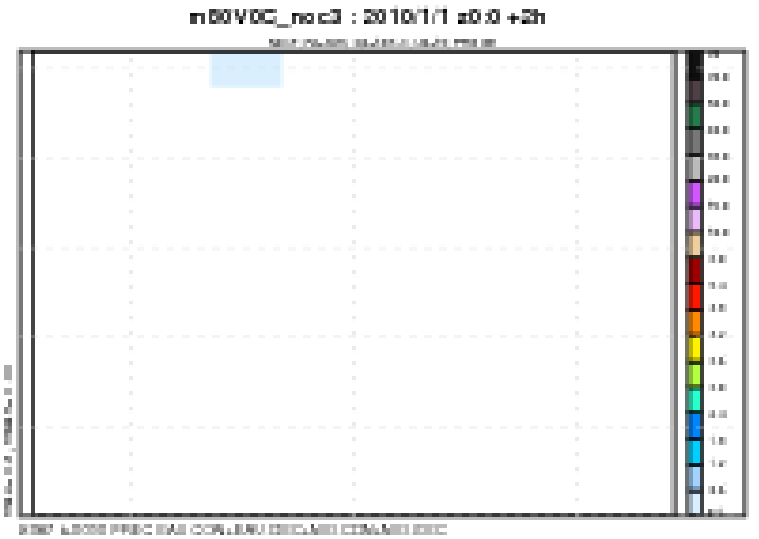


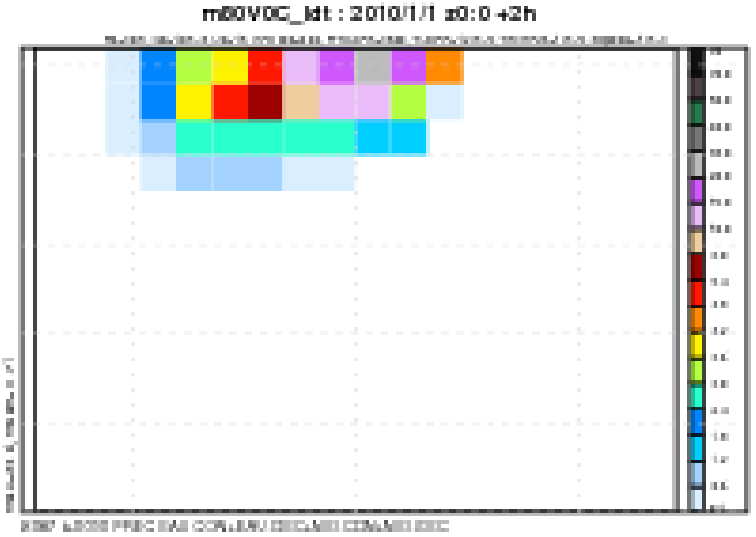


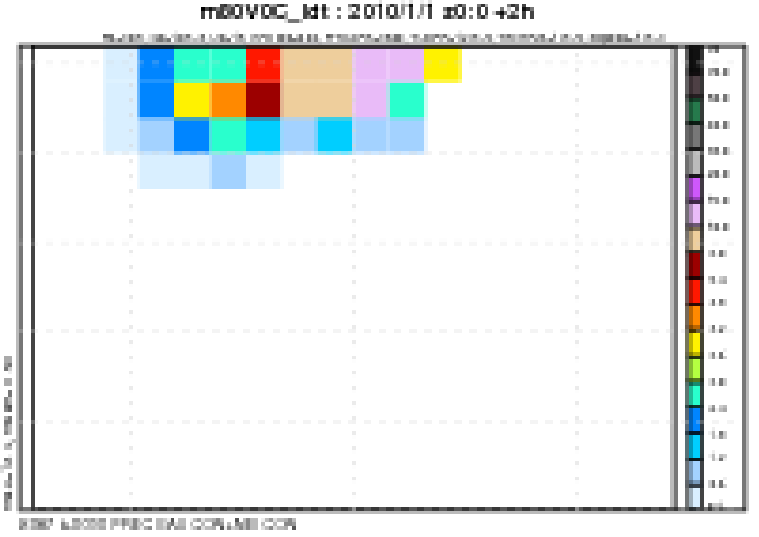


Deep convection in the gray zone: CSU (8 km)





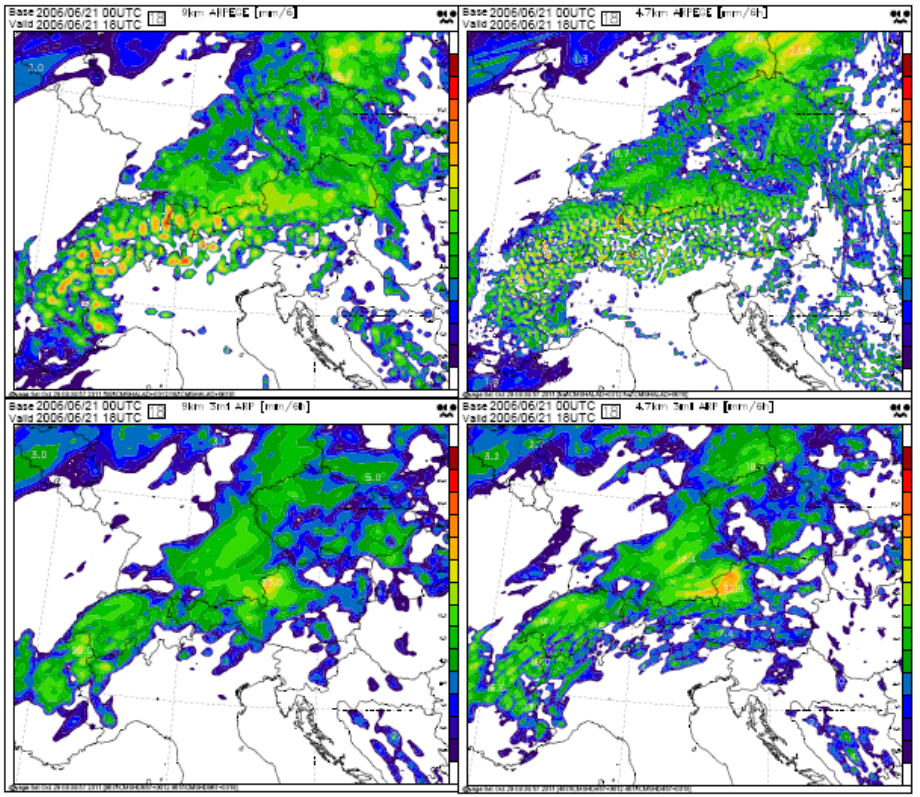




CSU

- This is a so-called Weismann-Klemp test.
- Although the CSU is not entirely multiscale, it is based on a technique that allows to switch itself off at the resolved scale.

3MT in ARPEGE (Cz with some contributions from Be)



- It is scientifically possible to implement 3MT in ARPEGE.
- The next steps:
  - (i) to agree on the implementation (i.e. identify a scientific testbed), (ii)
  - perform tests on the globe, and (iii) deduce coding guidelines and didactical material for
  - flexibility/modularity/generalilty (see strategic plan).

ALADIN related developments in Hungary, 2011

Development of the operational AROME (2.5km) model:

- generally improved T2m and cloudienss forecasts compared to ALADIN
- improvements in the diffusion scheme → improved wind gust and diurnal cycle of precipitation
- data assimilation started (first steps towards RADAR and METOP/IASI assimilation)

Development of the operational ALADIN (8 km) model:

- improved physical parametrizations tested (ALARO: convection and microphysics) → better upper air scores
- improved surface scheme (SURFEX) → better 2m fields in certain conditions
- improved background errors in the 3DVAR assimilation

Development of the operational ALADIN EPS system:

- improved (ALARO) physics in operations
- increased resolution (12 km → 8 km)
- additional surface perturbations

→ Better spread skill

Land surface modeling/assimilation (GEOLAND project):

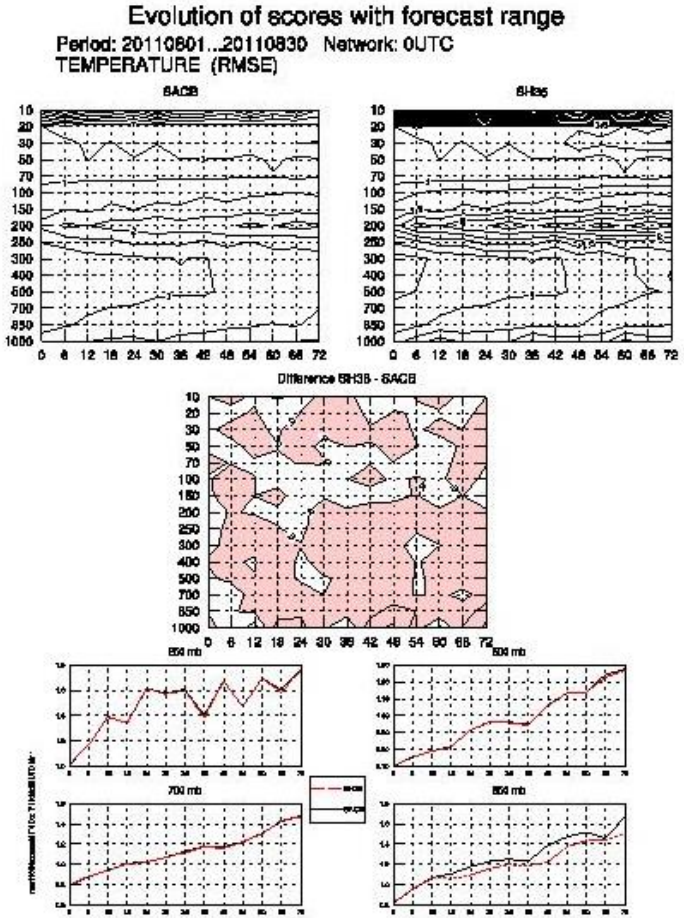
- research on CO_2 modeling
- LAI (Leaf Area Index) assimilation

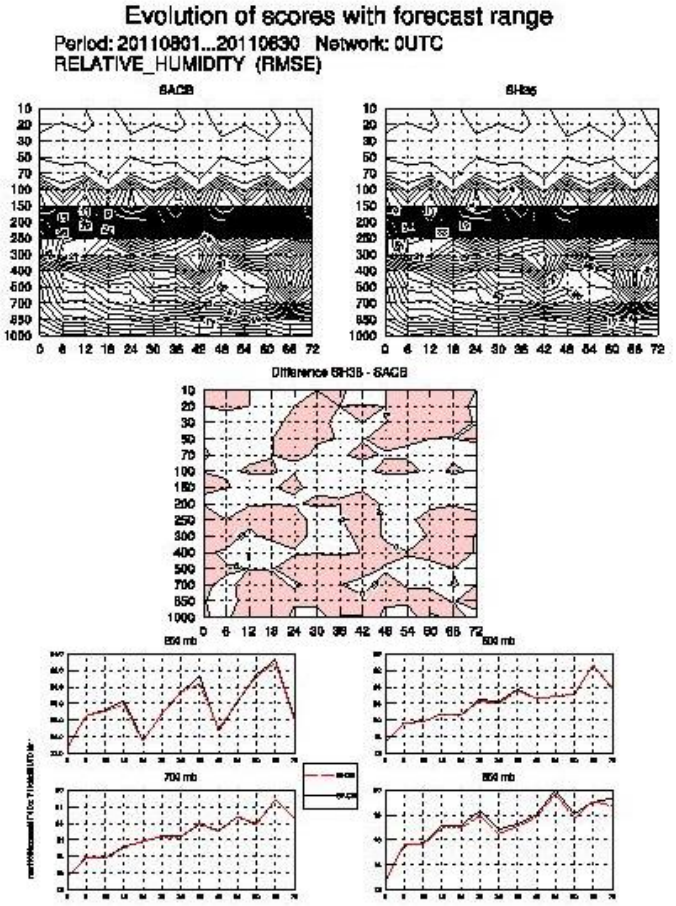
OPLACE (Operational Observation Preprocessing for LACE):

- maintenance and adding METOP/IASI observations

SI: CANARI – parallel suite verification

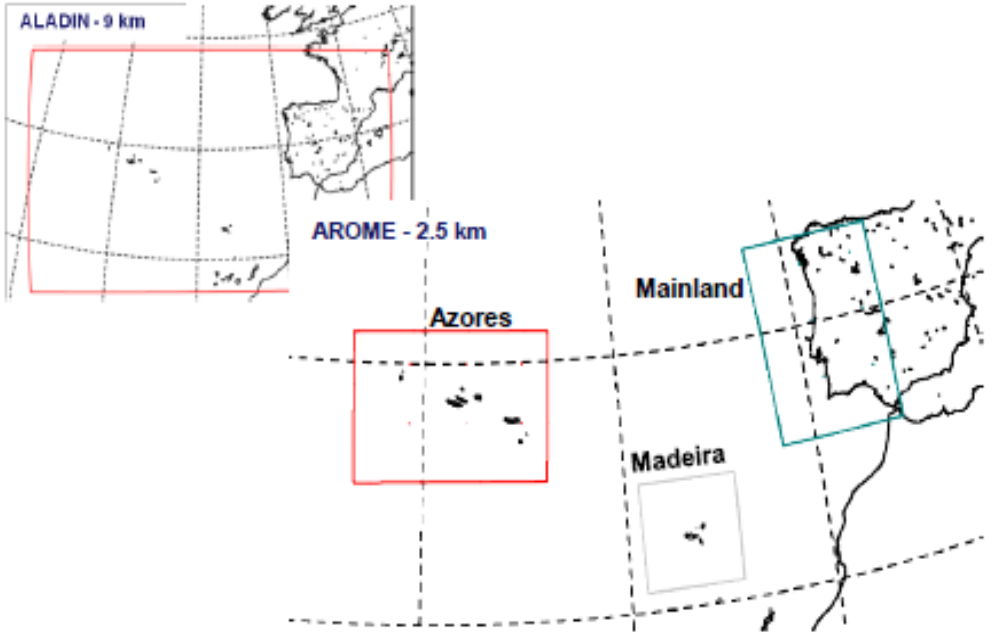
- Prediction quality improved during 08/2011





à frente do nosso tempo

OPERATIONAL activities: 36T1 upgrade of ALADIN-AROME forecasting system



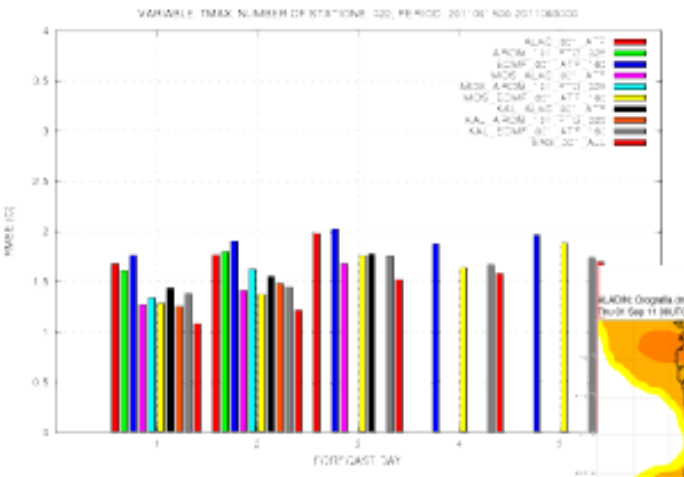
PROJECT I&D: Development of flow-dependent assimilation methods

Impact study : On-line updating of the background error covariances on the ALADIN-France system (M. Monteiro/IM I.P., L. Berre/Météo-France)

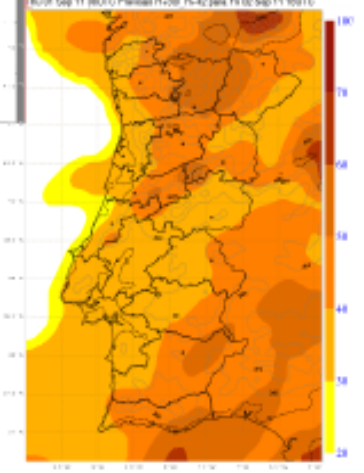
To be published : *Impact study on the use of time variations of regionally-averaged balanced background error covariances*

Local development: new derived products for forecasters

► MOS, Kalman filter and an "ensemble" product to forecast extreme daily temperatures are produced and verified (validation has shown advantage on the use of the "ensemble" product)



► Probability of thunderstorm occurence



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Romania - 2011

Data Assimilation

ALARO model - cycle 35t1
6.5 km, L49

CANARI + 3DVAR

- data from **OPLACE** : SYNOP, SYNOP-SHIP, TEMP, PILOT, PILOT-SHIP, “wind profiler” AMDAR, AIREP

- synop data from the local network – 163 stations

Improving FullPos Algorithms

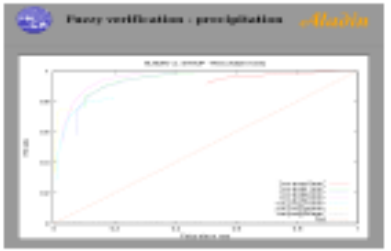
Staff: Tayfun Dalkılıç

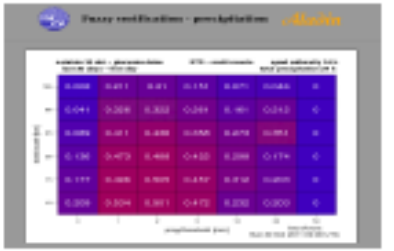
When making historical files in FullPOS, it needs to invoke two parts which are required to start the control cascade from almost the beginning. By removing the code below the condition LFPART2 and making more straightforward mechanism instead is planed in this study. Scalability of FullPOS can be increased avoiding from these limitations.

Polish contribution to ALADIN Consortium enterprises

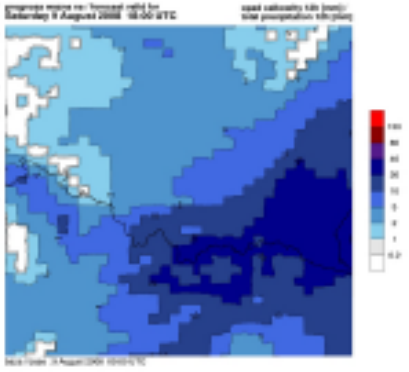
- Year 2011

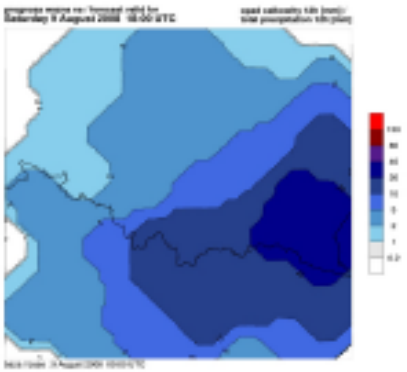
Mesoscale fuzzy verification system is ready to use and currently under quasi – operational tests at IMWM. Results of verification are available at web pages.

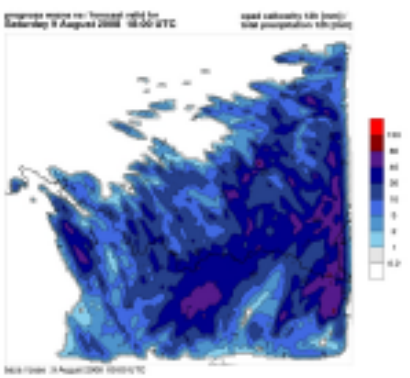


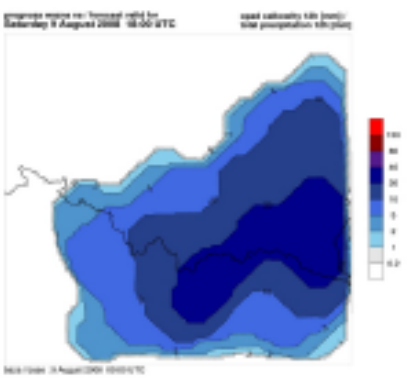


New scale-sensitive, robust verification / comparison method based at Iterative 4-Directional Weighted Median Filters is under development. Software for non-smooth meteorological fields filtering and matching is prepared.

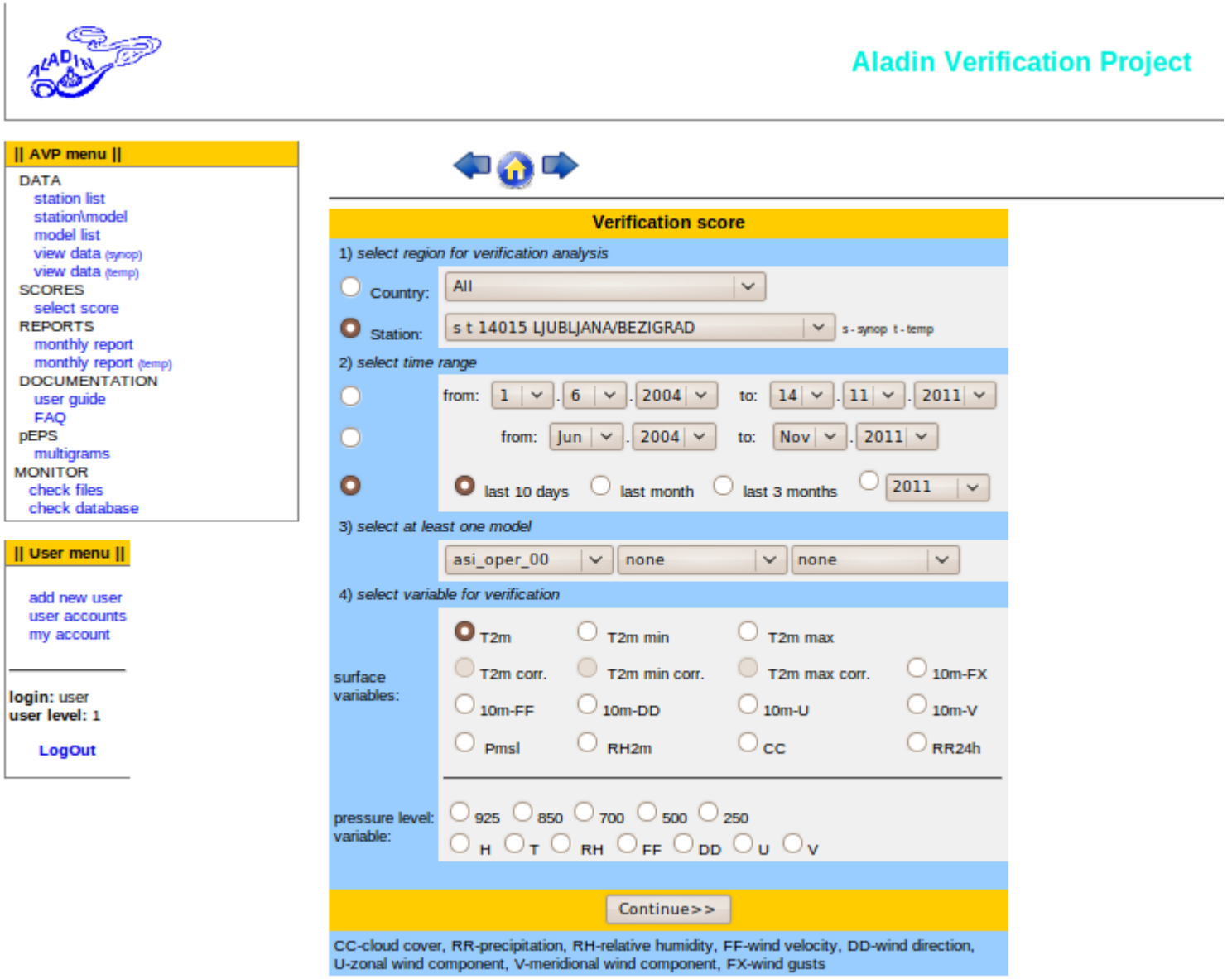








Versus a verification for end users?



Some work was done to “wake up the sleeping beauty” (Be-Si)

Slovenia: operational data assimilation at 4.4 km

MODEL

- 4.4 km, 43 levels, 450 x 432 grid points
- *ALARO 3MT physics*
- *Lateral boundary conditions from ARPEGE*
- 2 production runs (00,12 UTC) +54 h, since March 2011

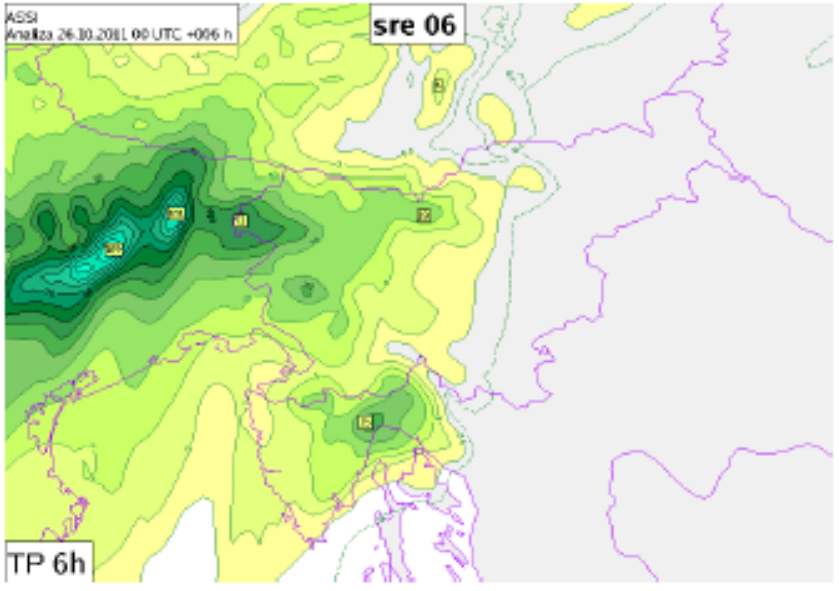
ANALYSIS

- 6 h assimilation cycle
- 3D-Var observations: surface (GTS + local) observations (T, RH, GH), AMDAR (T, U), MSG AMV (U), radiosoundes (T, RH, U), wind profiler (U), radiances (NOAA AMSU-AB, MSG SEVIRI), testing new observation types (METOP, IASI, Mode S)
- CANARI surface analysis using 2 m observations (T, RH)
- *Sea surface analysis from ARPEGE*
- *Digital filter initialization with shorter time span*
- *Initialization of 3MT prognostic fields from first guess*

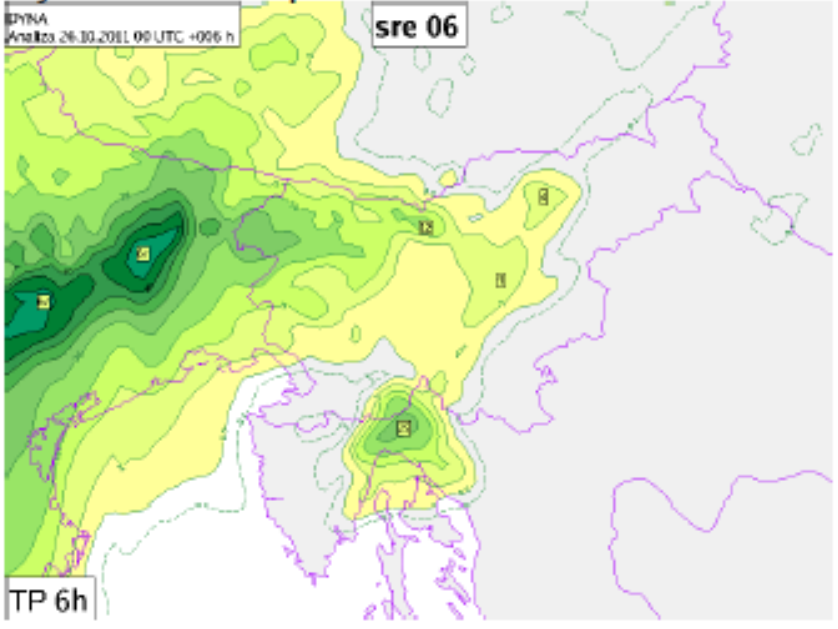
SCORES

- Improved surface forecast
- Upper air neutral on average, differences with respect to dynamic adaptation (mostly improvements) for a number of cases

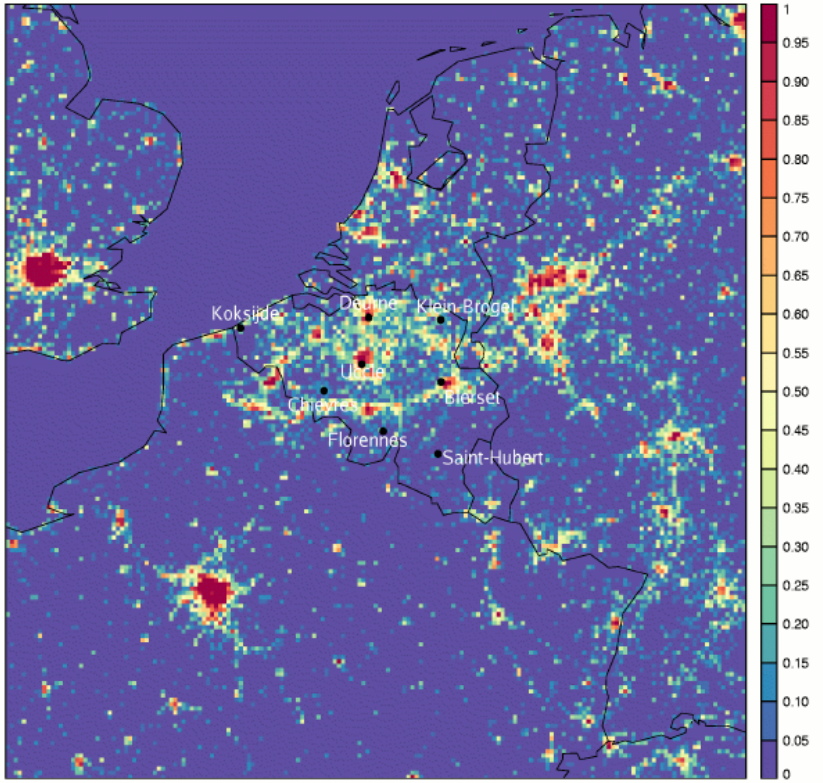
Local data assimilation

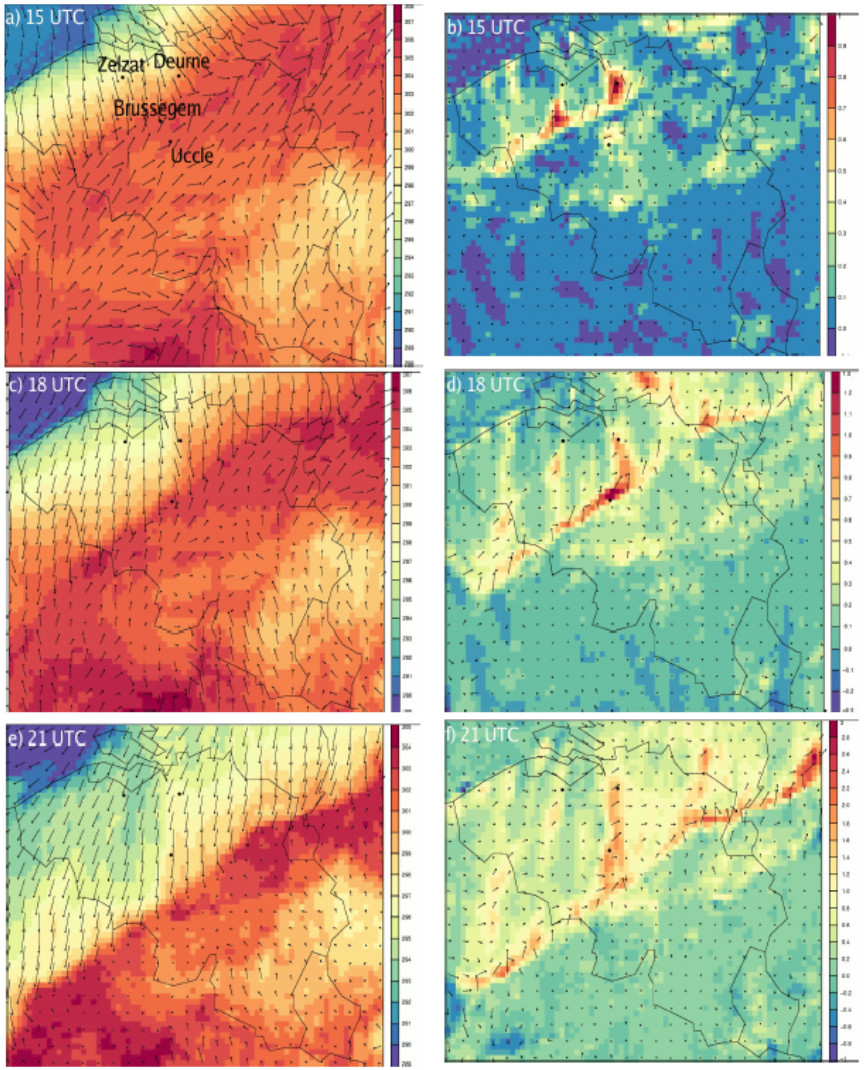


Dynamical adaptation



Additionally: the new scientific surface developments are happening in SURFEX





Horizontal variations in meteorological fields valid on the 8th July 2010. Temperature (K) and wind vectors (m s1) at ~30m AGL for ALRTEB, And temperature difference (K) and wind vector difference (m s1) at ~30m AGL: ALRTEB minus ALROPR. At 15 UTC: (a) and (b), respectively, at 18 UTC © and (d), and at 21 UTC (e) and (f).

Conclusions

- Data assimilation: OPLACE is crucial for implementing 3Dvar, even in small countries.
- Verification (we need to coordinate), we have some “sleeping beauty” in Si, woken up by A. Deckmyn (Be) and we should complement is with fuzzy methods (Pl).
- Deep convection, two milestones:
  - By adding more flexibility, R. Brozkova, demonstrated that our frame is more general than we thought.
  - First multiscales runs with NH dynamics (research in the pipeline)!
- SURFEX: exhibiting recent scientific evolutions (TEB) allows better simulation of atmospheric mechanisms!
- Tk: Someone (whom I don't know yet) has the courage to face the code structure of Full pos, and could become a code expert ...!