# Data assimilation activities@SHMU

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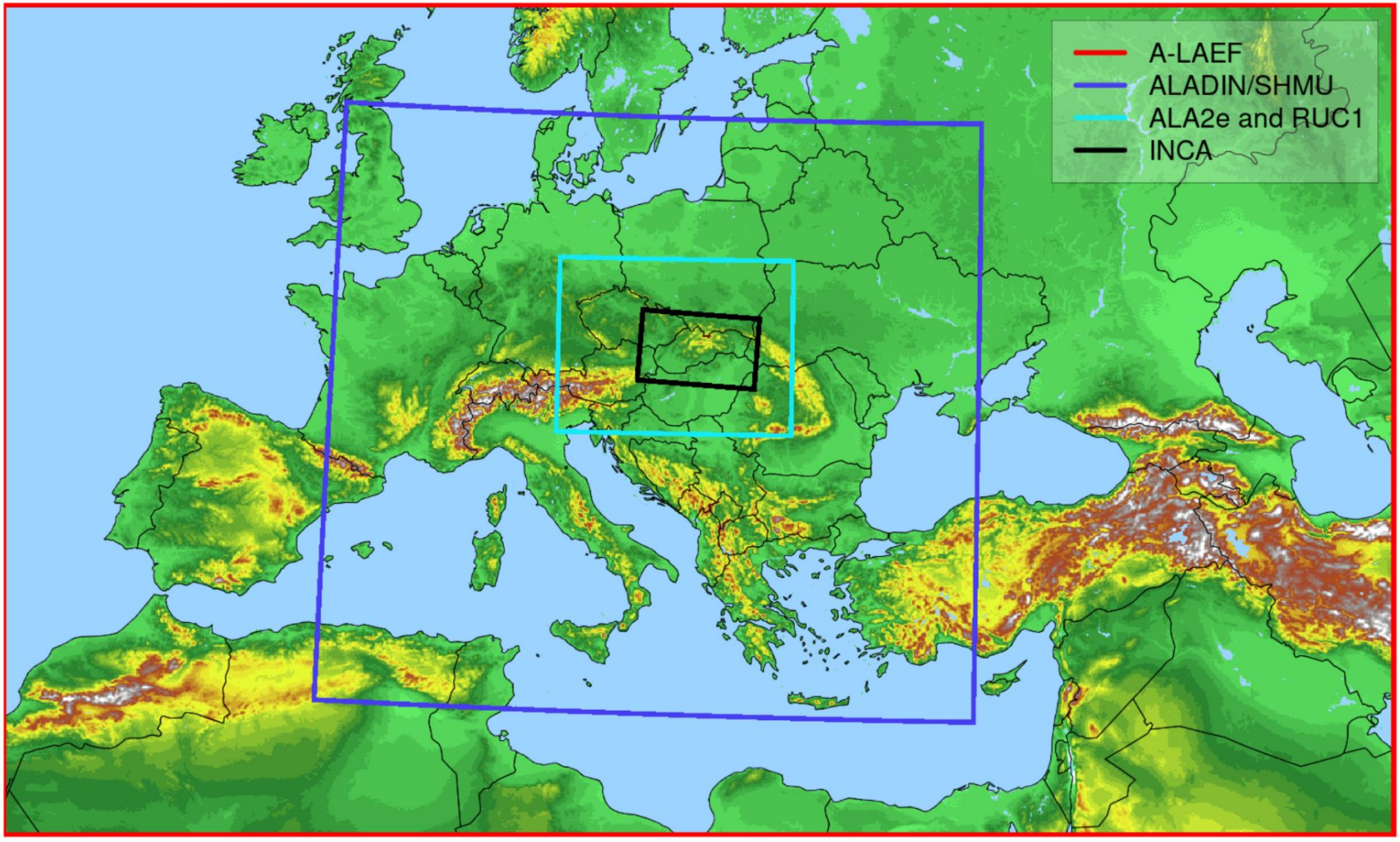
RC LACE DA working days online, 5-6 Sept 2024

# ALADIN (ALARO) systems at SHMU

| CSC | A-LAEF | ALADIN/SHMU | ALA2e | RUC1/ALA1 |
|---|---|---|---|---|
| *status* | operational (common RC LACE) | operational | | test mode |
| *code version* | CY40T1bf07+ | CY46T1bf07 | CY48T3 | CY46T1bf07 |
| *physics* | ALARO-1vB (multi-physics + surface SPPT) | | ALARO-1vB | |
| *dx* | 4.8 km | 4.5 km | 2.0 km | 1.0 km |
| *points* | 1250 x 750 | 625 x 576 | 512 x 384 | 1024 x 768 |
| *vertical levels* | 60 | 63 | 87 | 87 |
| *time step* | 180 s | 180 s | 90 s | 30 s |
| *forecast ranges + frequency* | 72/-/72/- hourly | 78/72/72/60 hourly | 72/-/72/- hourly | hourly, up to +12h or 48h (ALA1) |
| *coupling model* | ECMWF ENS (c903@cy48t2), 6h (time-lagged) | ARPEGE (long- & short cut off), 3h | ECMWF, 3h (time-lagged) | ARPEGE (time-lagged), 1h, SCC |
| *surface data assimilation* | ensemble surface data assimilation (ESDA) by CANARI | CANARI | A-LAEF CNTRL init downscaling | CANARI |
| *upper-air data assimilation* | spectral blending by DFI | Blending by DFI + 3D-Var | | 3D-Var |
| *initialization* | none | none | DFI | DFI |
| *HPC* | Atos Sequana XH2000 AMD (ECMWF) | NEC HPC – 240 nodes, 6230 Intel Xeon Gold Scalable Processors (Cascade Lake), Omni-Path, Linux | | |
| *nodes* | 85 | 40 | 40 | 40 |


A-LAEF
ALADIN/SHMU
ALA2e and RUC1
INCA
4200
4100
4000
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-100
-200

# UPGRADES

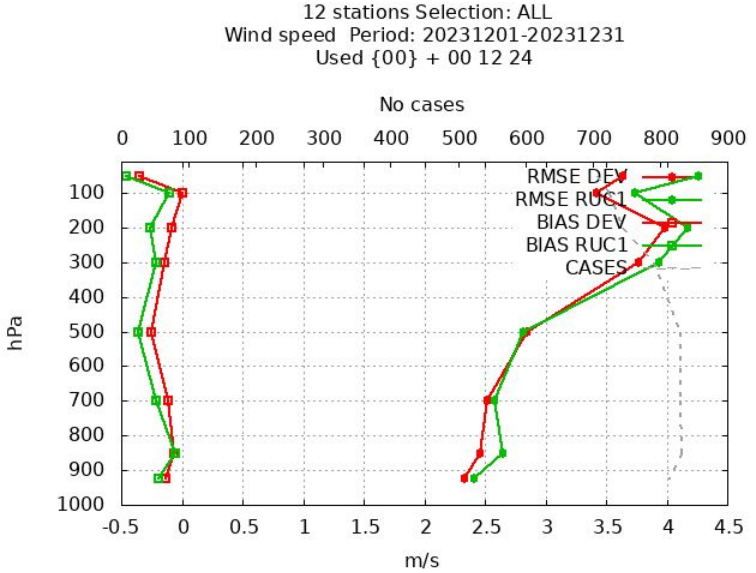
… since last RC LACE DA WD

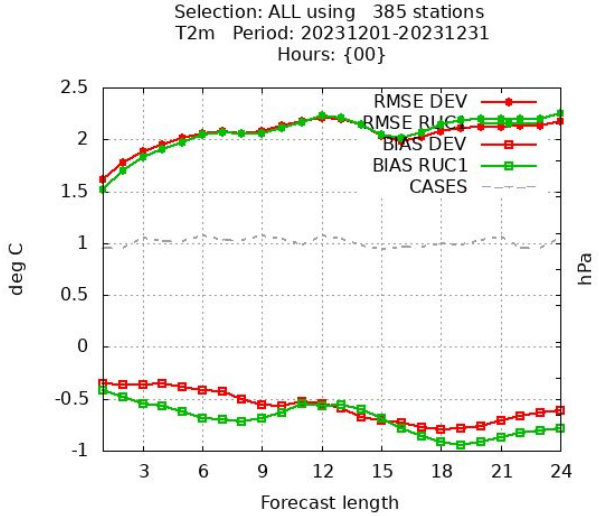
- no principal changes in upper-air 3D-Var + blending setup (observations, algorithmics)
- upgrade to **CY46T1_bf07** export + bugfixes - ALADIN/SHMU and RUC1
- treatment of sea surface temperature SST - ALADIN/SHMU and RUC1: blendsur replaced by **relaxation to SST from LBC0** (after CHMI)
- RUC1/ALA1 - **DFI** added, **L87**

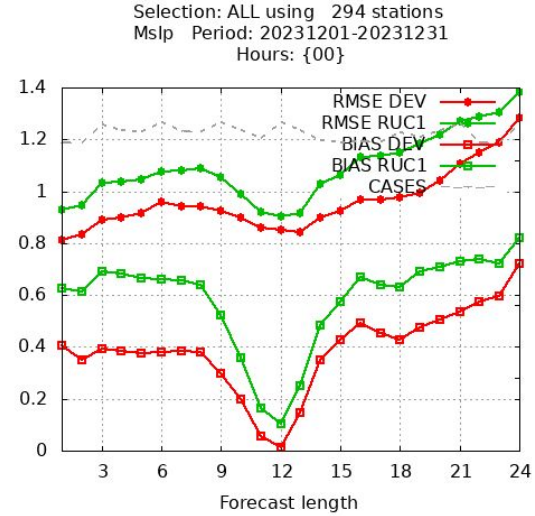
# RUC1: CY46t1+L87+DFI+new clims...

*M.Nestiak, A.Simon, M. Imrisek*

new setup **DEV** vs. old **RUC1**, Dec 2023: overall improvement



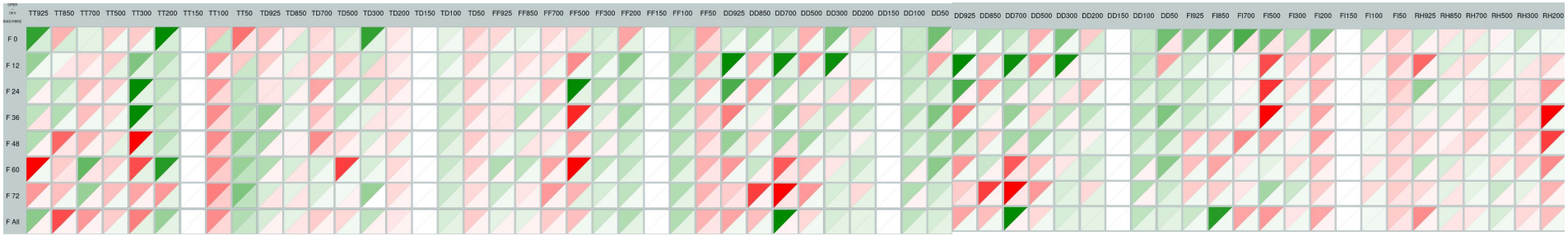



# IN PROGRESS - ALADIN/SHMU

*M. Imrisek*

- increase of vertical levels L63 ---> L87. Motivation: more levels are better suited for assimilation of GNSS ZTD?
- retuning of DFI blending; coupling TCC ---> SCC
- scores (July 2024) ~neutral?
- tbc.



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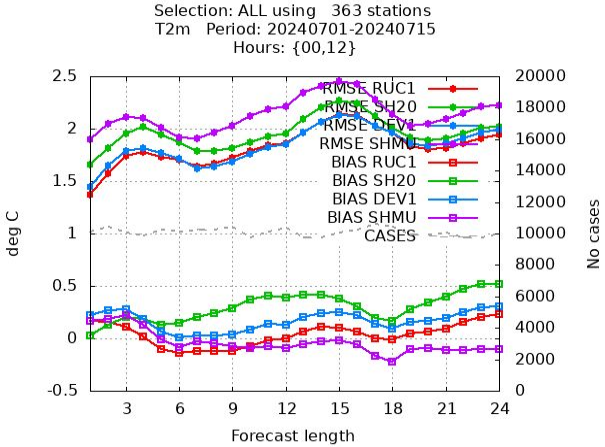
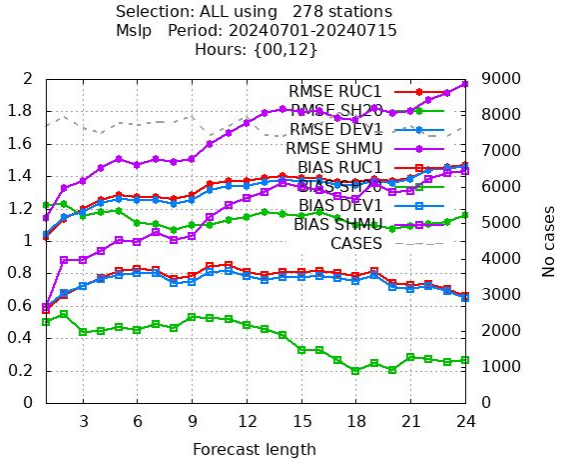
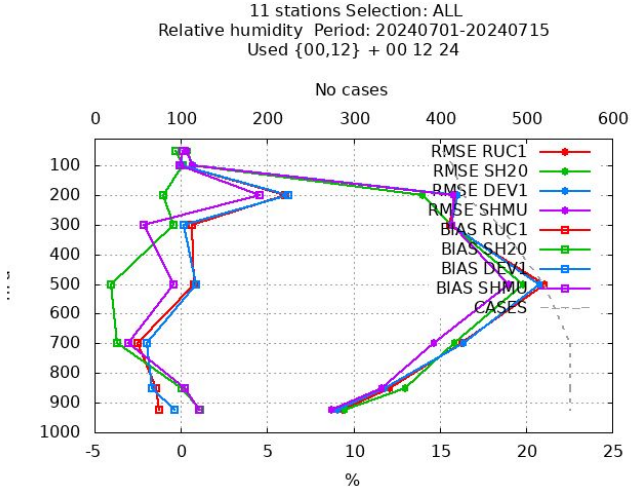
# IN PROGRESS - RUC1

*A.Simon*

- upgrade CY46t1_bf07 ---> CY46t1_bf07 + CHMI modset (incl. graupels)
- smoothing of soil wetness index + 3h cycling + …
- summers scores (July 1-15 2024) impression mixed **RUC1** vs. **DEV1** (new)
- summer case studies ongoing



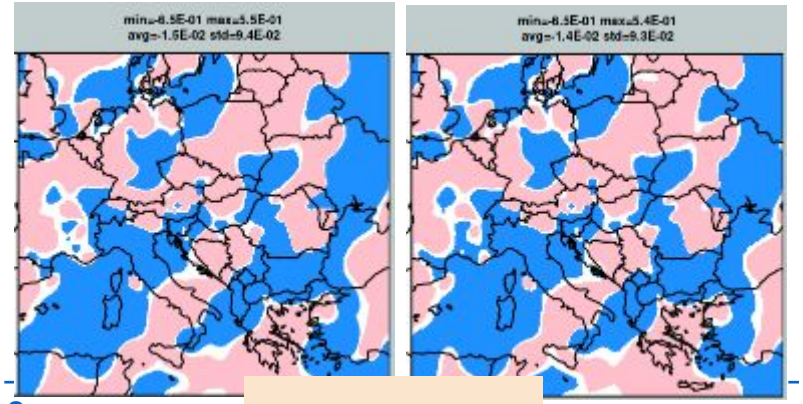



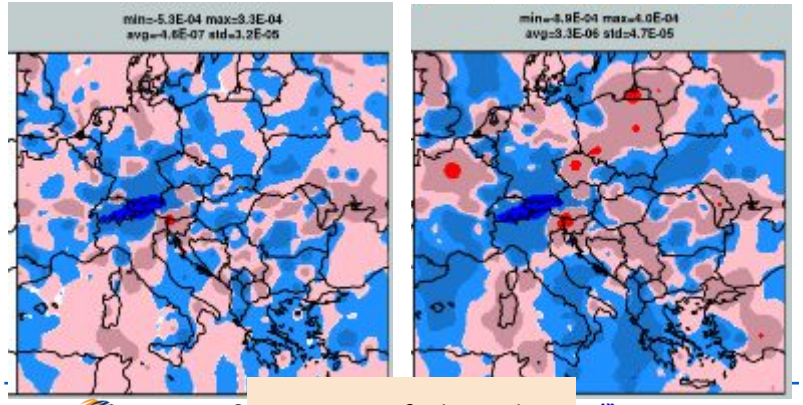
# IN PROGRESS - OOVAR

*M.Imrisek, O. Spaniel*

- technical installation: compilation + run on CY48T3(_export)
- following Beni's document *The OOPS system for data assimilation - a short user introduction*
- the differences between OPER-MASTERODB (left panels) and OPER-OOVAR (right panels) are in remarkable match with slightly more extremes in OOVAR (OPER=CY46t1bf07)




SURFACE PRESSURE




S060 specific humidity

# ALREADY REPORTED & STAYS

- M. Petrovic: initialisation experiments in RUC1 (diploma thesis) - IAU, **DFI**, IDFI
- M. Nestiak: Automated comparison of NIMBUS/OIFS products
- M. Imrisek: Introduction of GNSS STD to ALADIN NWP system

- M. Petrovic: Data assimilation and validation of radar radial winds observations (report under preparation)

# FUTURE PLANS

- assimilation of SEVIRI (M. Petrovic)
- assimilation of GNSS (M. Imrisek)
- upgrades of RUC1 (M. Nestiak, A. Simon)