Zentralanstalt für Meteorologie und Geodynamik

Summary of ALADIN/LACE activities at ZAMG

Stefan Schneider

SRNWP meeting 2010, Zürich, Switzerland

Actual data assimilation projects at ZAMG

- SURFEX with ASCAT data
- CANARI / CANARI+3DVAR
- 3DVAR with GPS data

Actual data assimilation projects at ZAMG

- SURFEX with ASCAT data
- CANARI / CANARI+3DVAR
- 3DVAR with GPS data

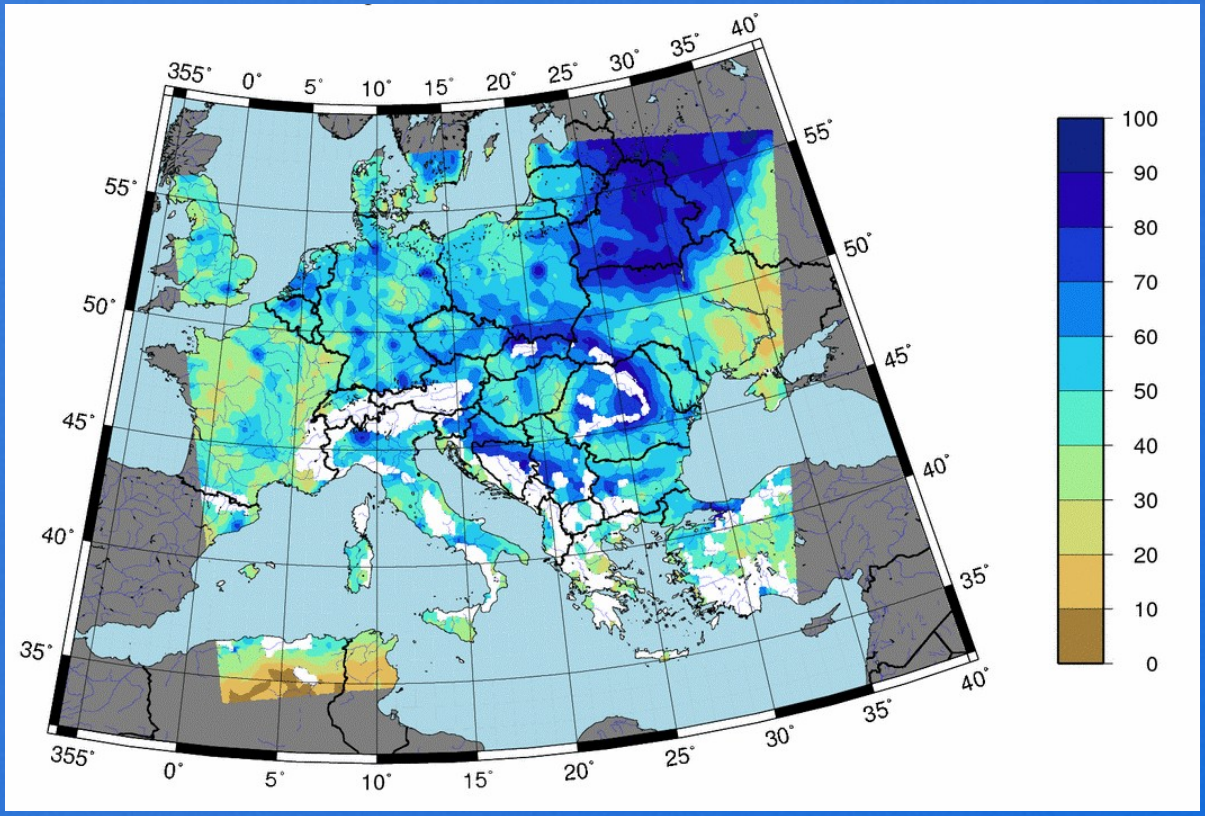
SURFEX (SURFace EXternalisée)

- assimilation based on the Simplified Extended Kalman Filter (EKF)
- version: 4.8
- prognostic variables: wg, w2, Ts, T2
- data to assimilate: soil moisture, T2M, RH2M
- data screening: CDF matching, quality flags

- 6hourly assimilation cycle every 6 hours
- offline mode

SURFEX / ASCAT

mean ASCAT soil moisture for January-June 2010



http://www.zamg.ac.at/satweb/Kunden/HSAF_products/h07/

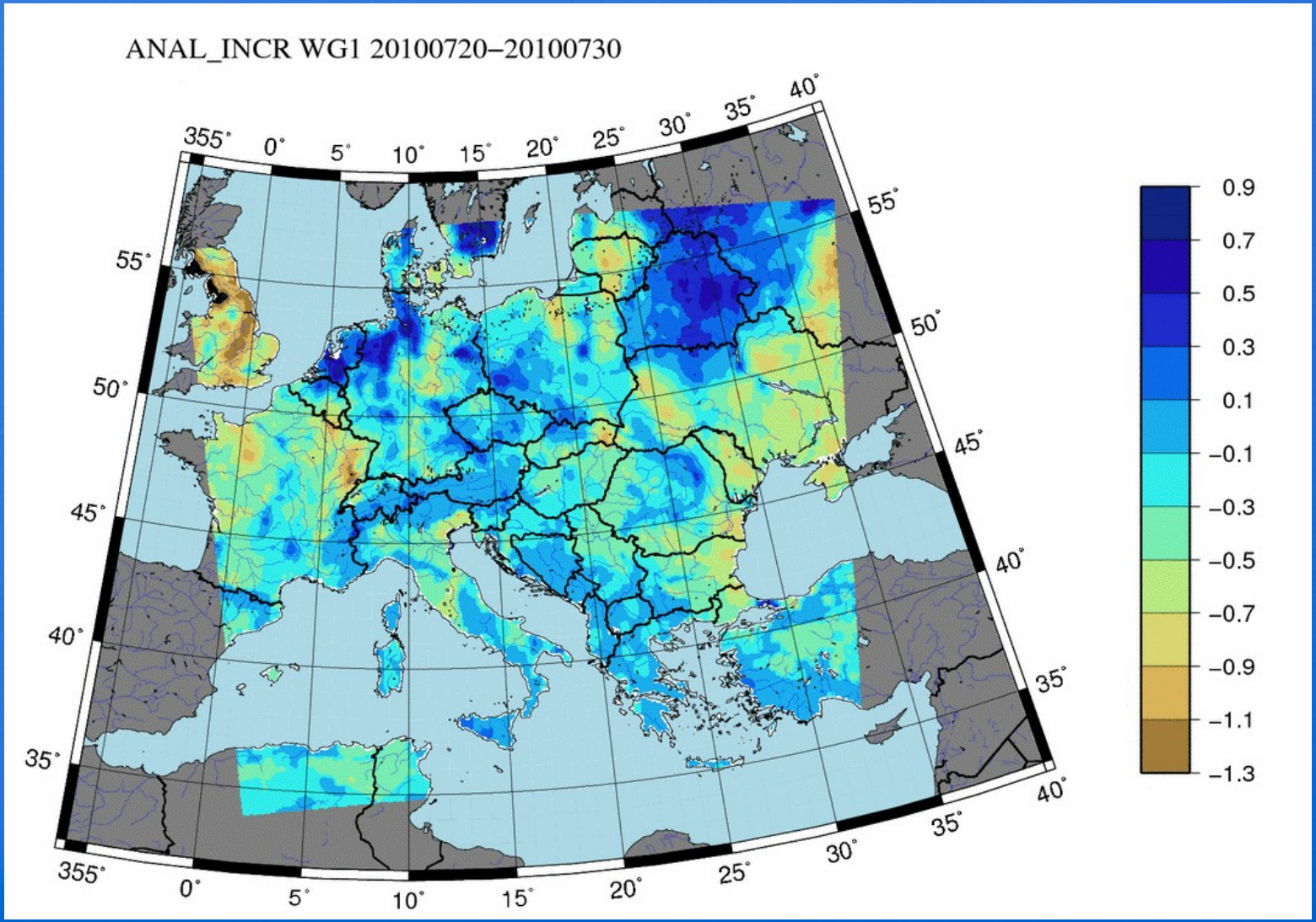
Advanced Scatterometer on board METOP

polar orbiting satellite active Scatterometer microwave spectrum (λ=5.7cm)

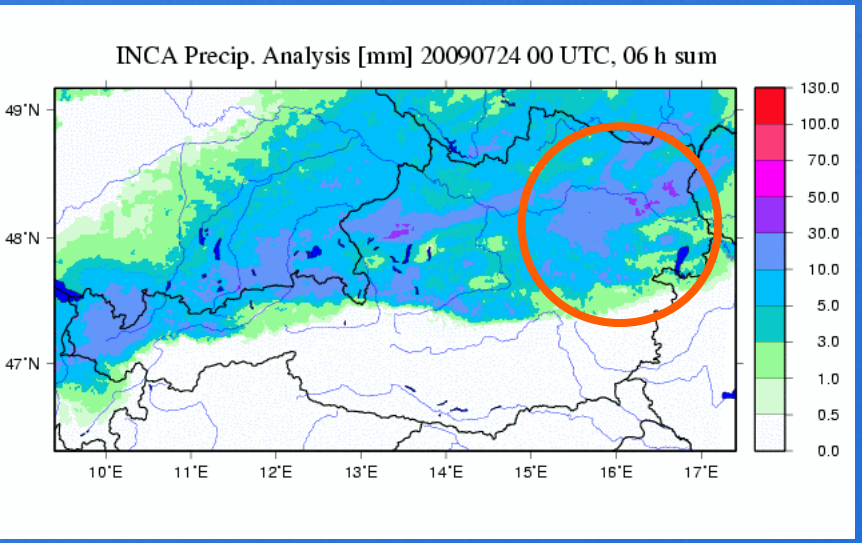
spatial resolution: 25km
temporal resolution: ~1.5d
Data availability: ~2 hours after the measurement

soil moisture values valid for 0-2cm depth

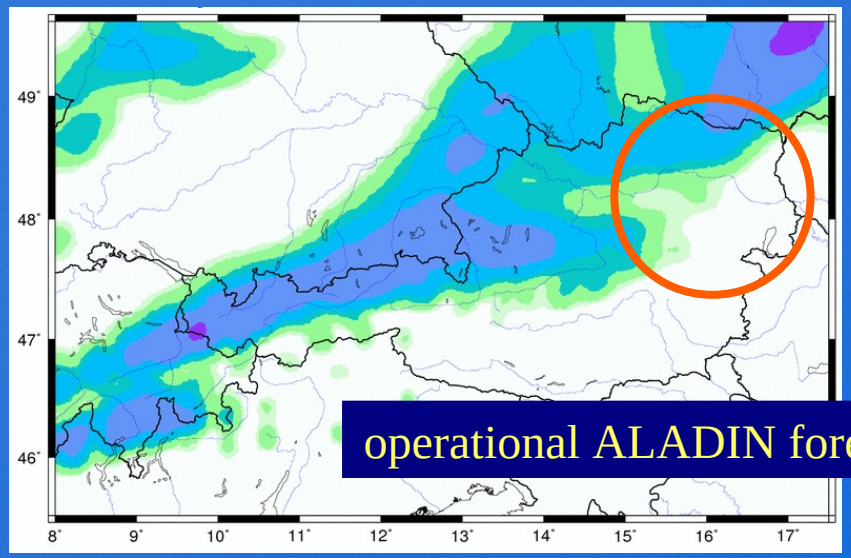
analysis increments

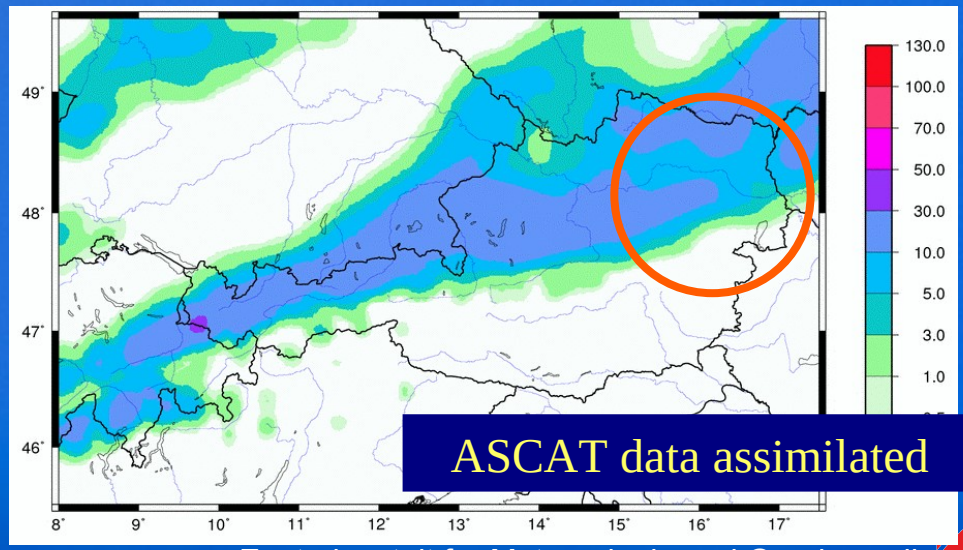


Case study of a severe thunderstorm in Vienna on July 23rd, 2009

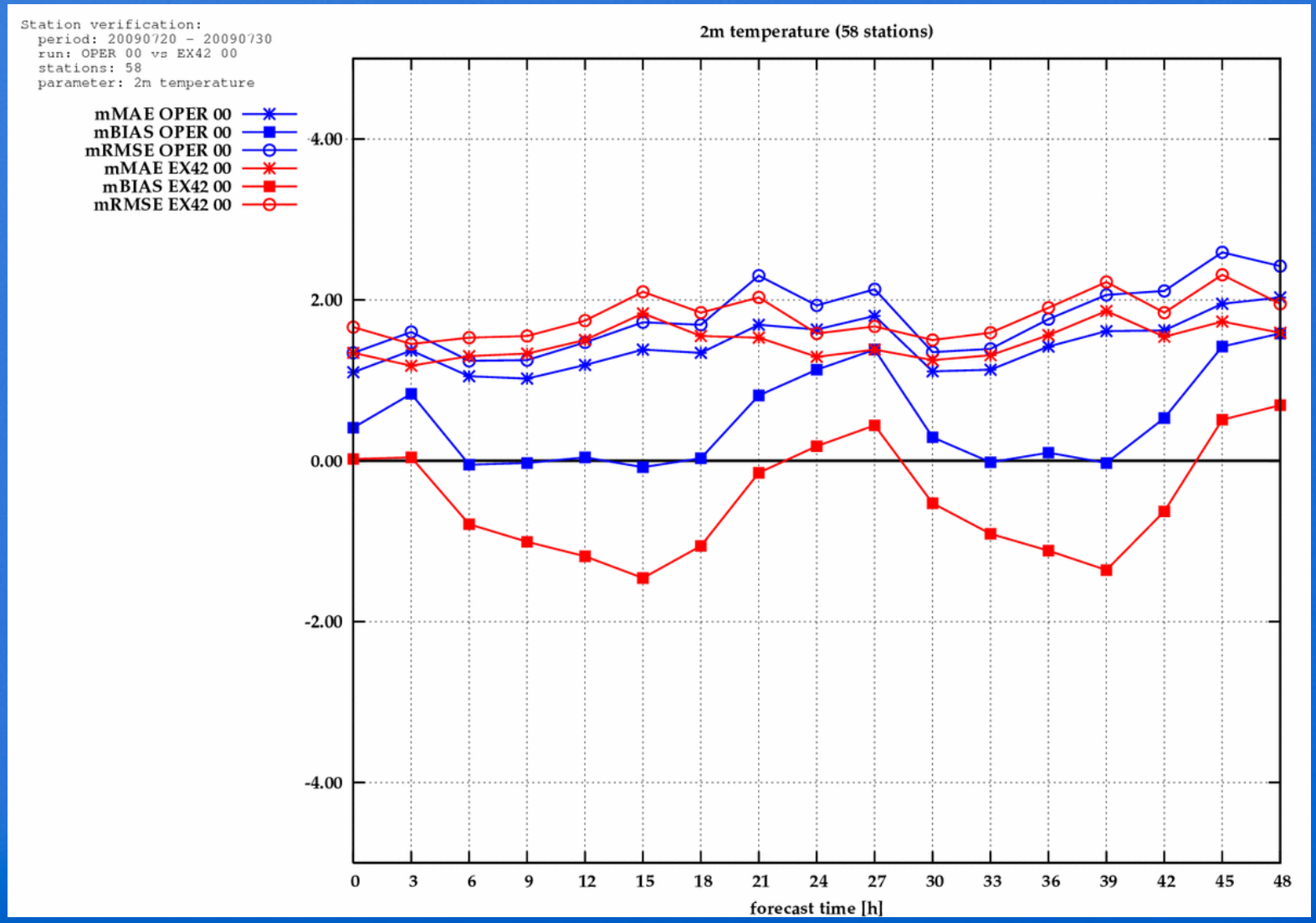


INCA precipitation analysis
23.7.2009, 18-00UTC

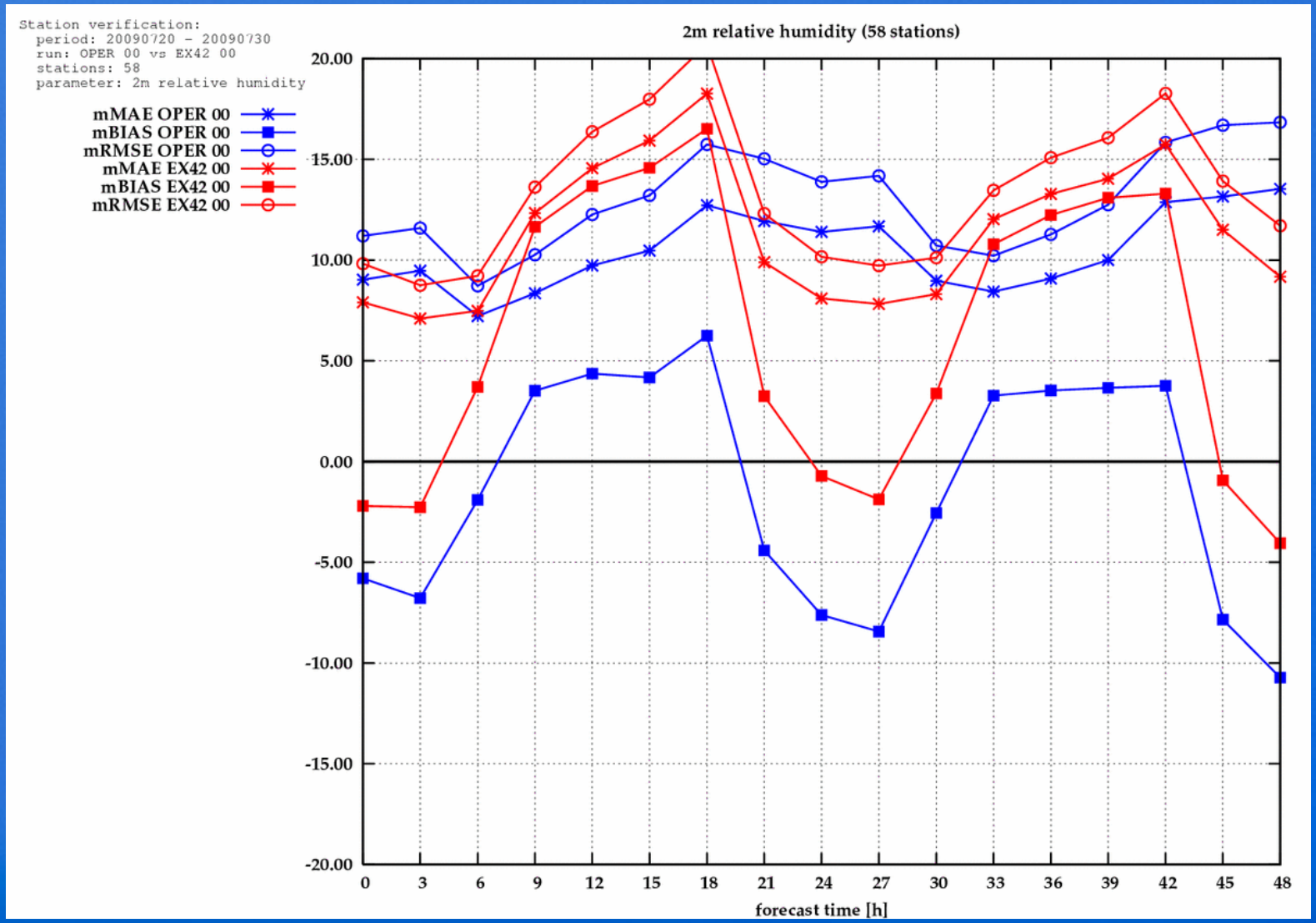




verification of forecasted 2m-temperature for July 2009



verification of forecasted 2m-relative humidity for July 2009



SURFEX

+ improvement for single events
+ Preoperational test suite is technically ready to start

- BIAS correction needs to be improved
- boundary layer is too moist on average – RH2M
- too much convective initiation

→ further tuning of the model is required

Actual data assimilation projects at ZAMG

- SURFEX with ASCAT data
- CANARI / CANARI+3DVAR
- 3DVAR with GPS data

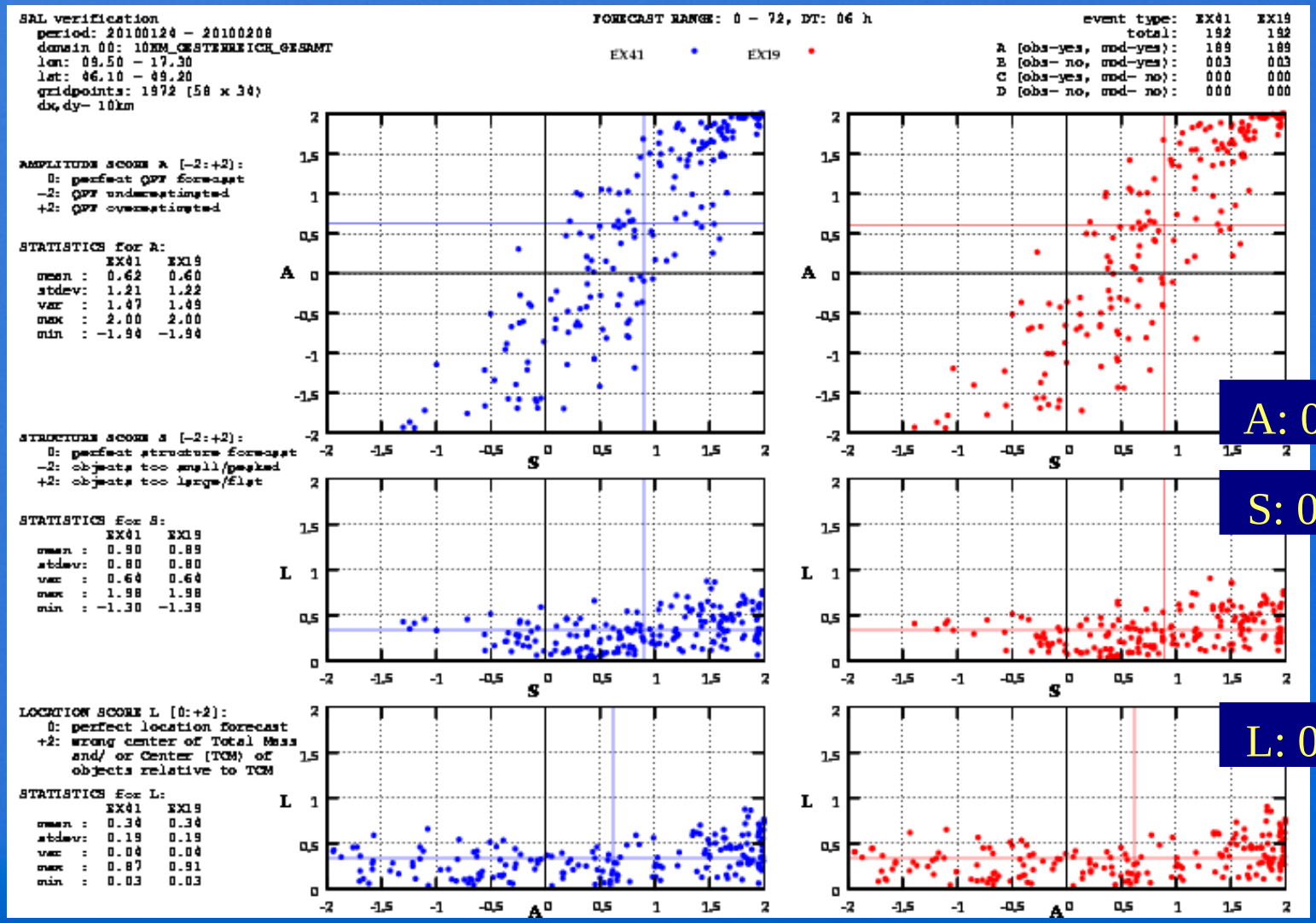
CANARI (Code d'Analyse Nécessaire à ARPEGE pour ses Rejets et son Initialisation)

- cy32t1 for assimilation
- cy35t1 for forecast (927/001/FPOS)

- assimilated parameters: T2M, RH2M (OPLACE and ZAMG database)

- prognostic variables:
  - SURFRESERV.EAU
  - SURFTEMPERATURE
  - SURFRESERV.NEIGE
  - SURFRESERV.INTER
  - SURFRESERV.GLACE
  - PROFTEMPERATURE
  - PROFRESERV.EAU
  - PROFRESERV.GLACE

results : OPER (blue) vs OPLACE+TAWES (red)

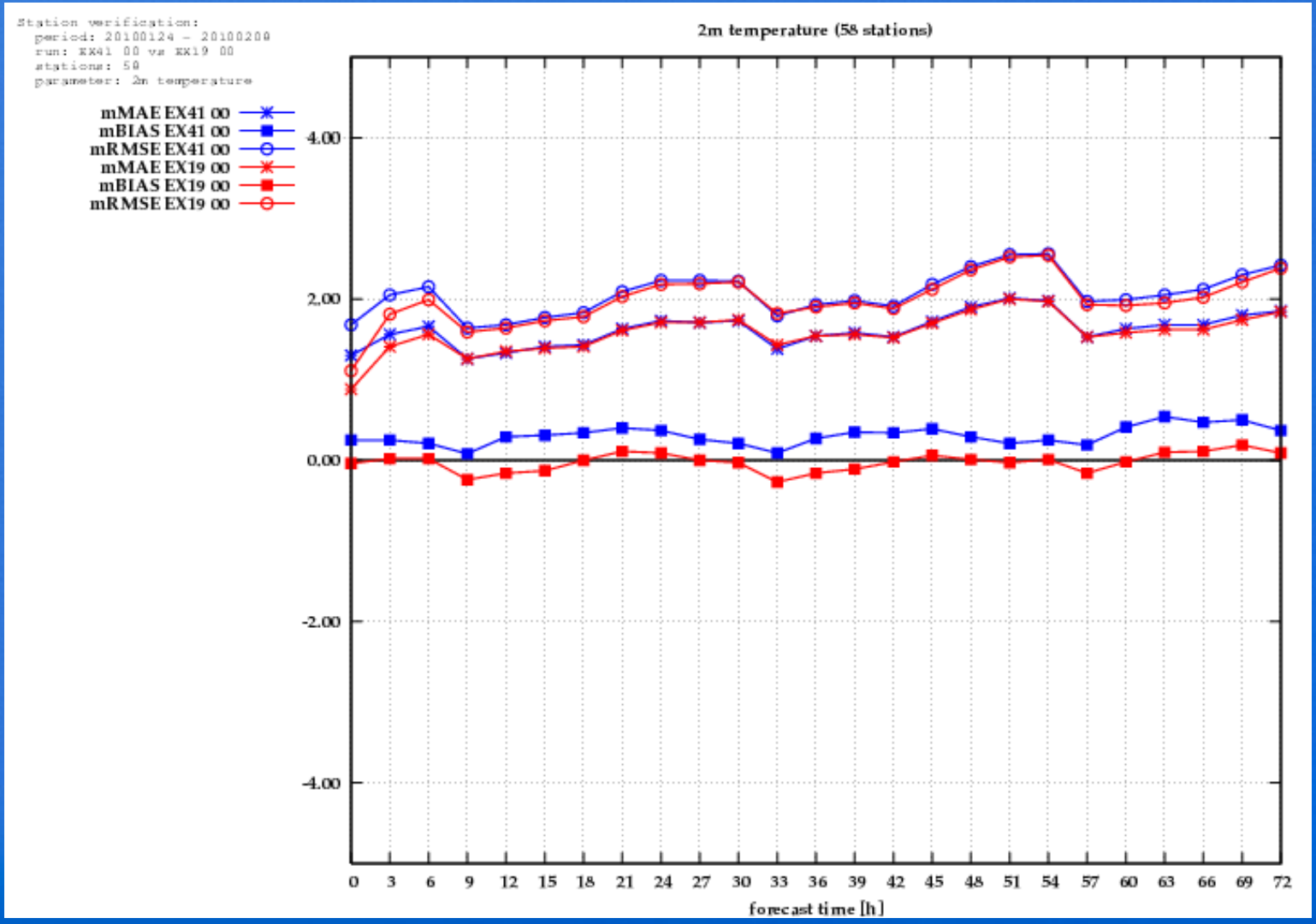


A: 0.62 vs 0.60

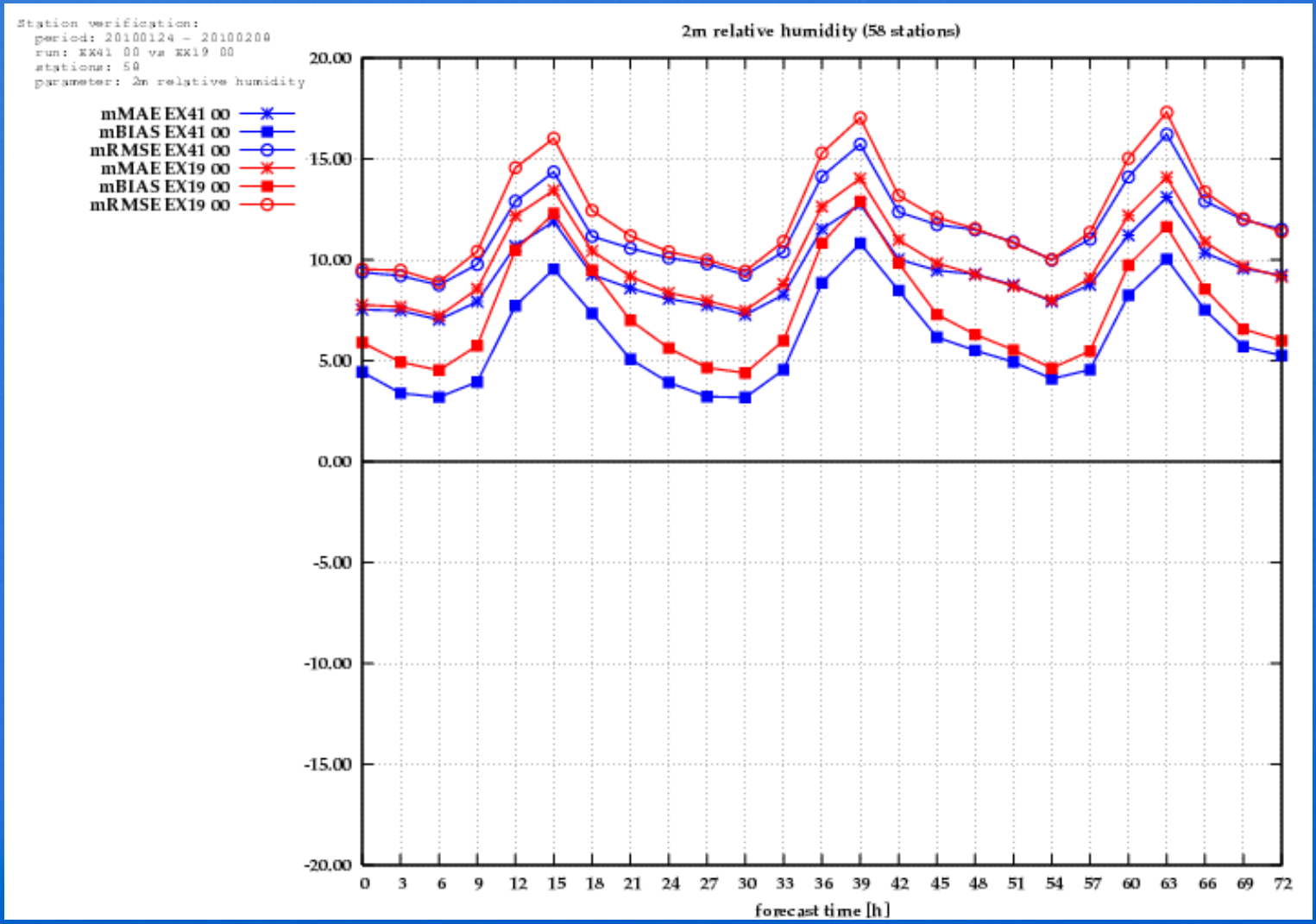
S: 0.90 vs 0.89

L: 0.34 vs 0.34

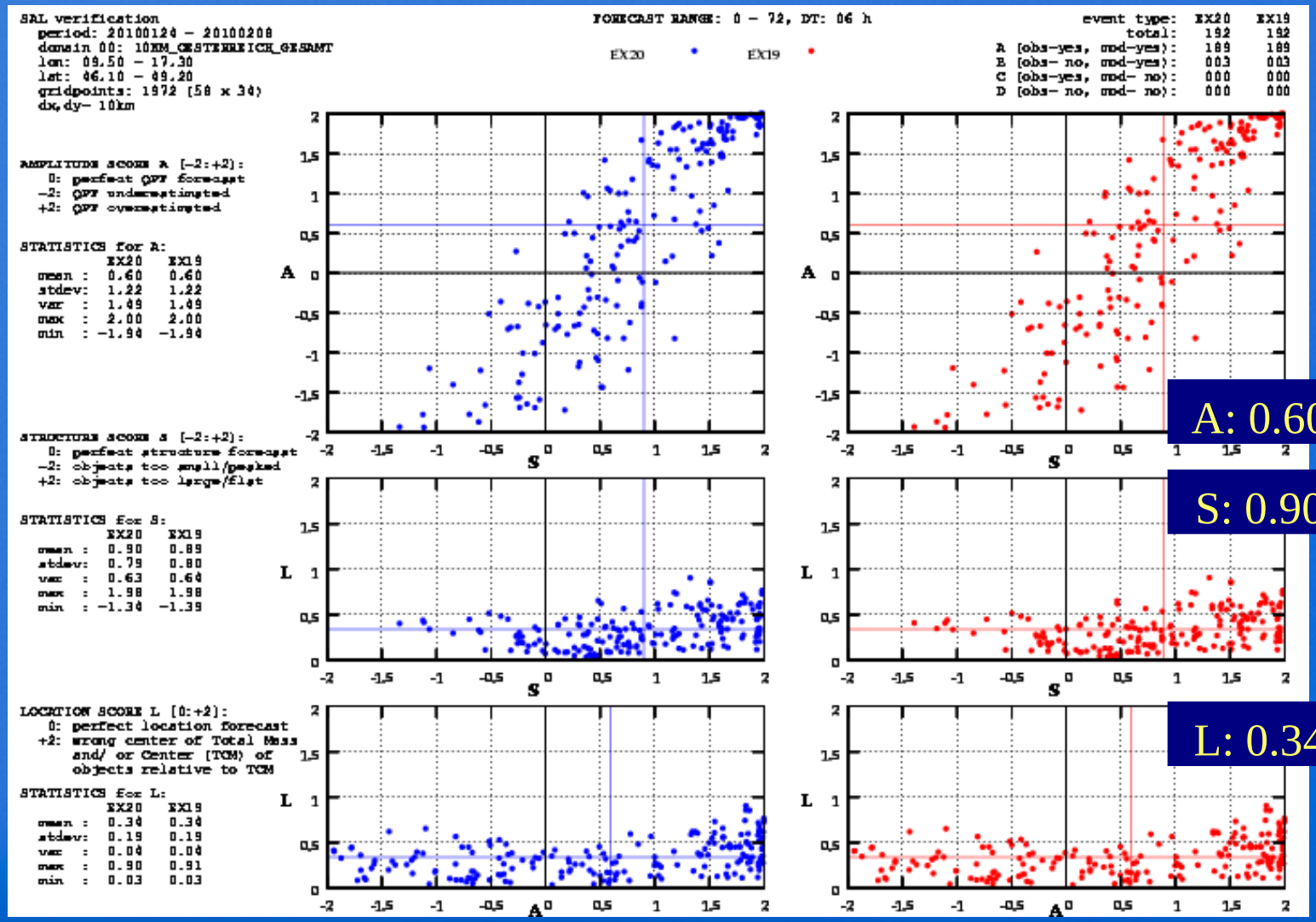
results : OPER (blue) vs OPLACE+TAWES (red)



results : OPER (blue) vs OPLACE+TAWES (red)



results : OPLACE (blue) vs OPLACE+TAWES (red)

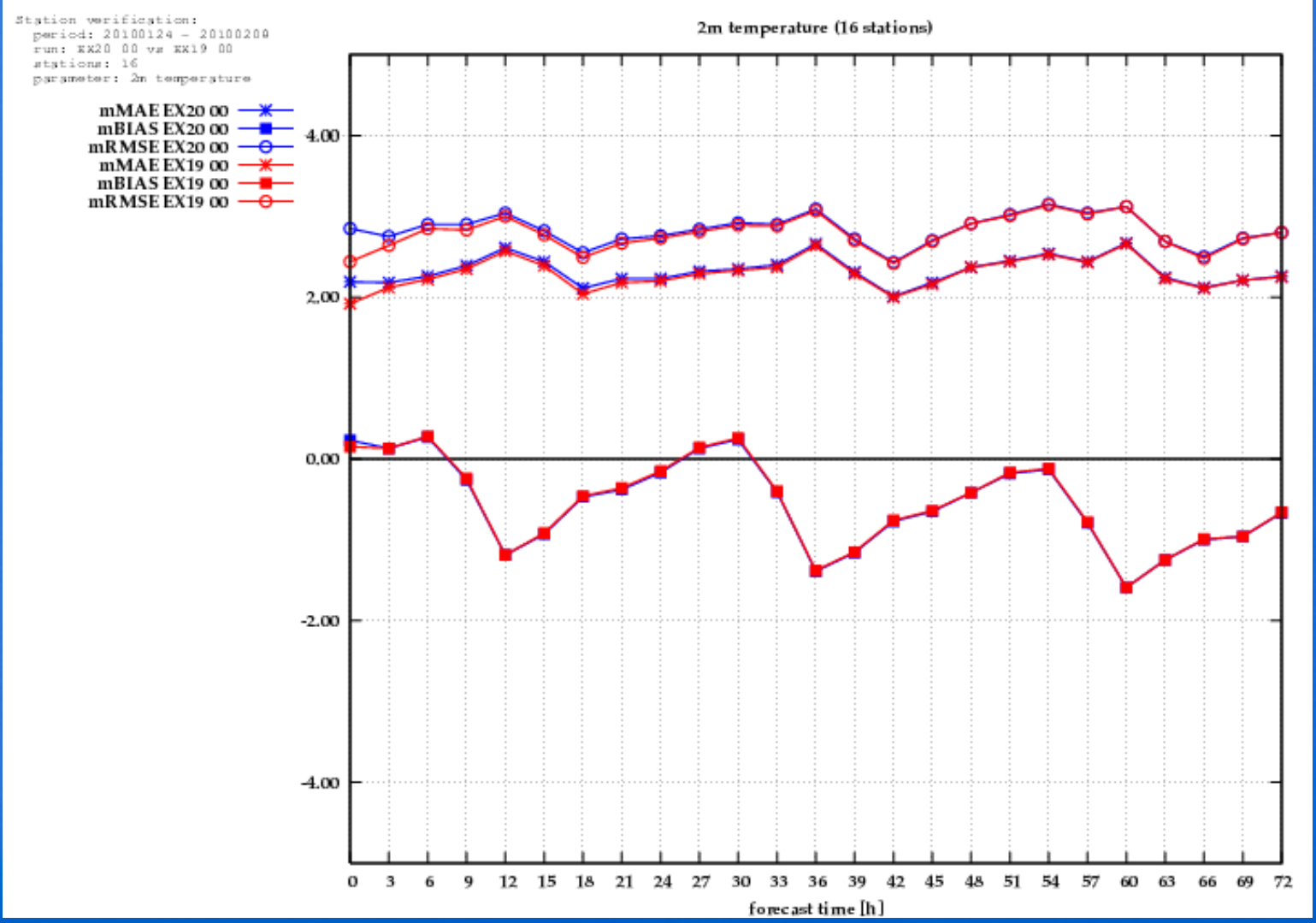


A: 0.60 vs 0.60

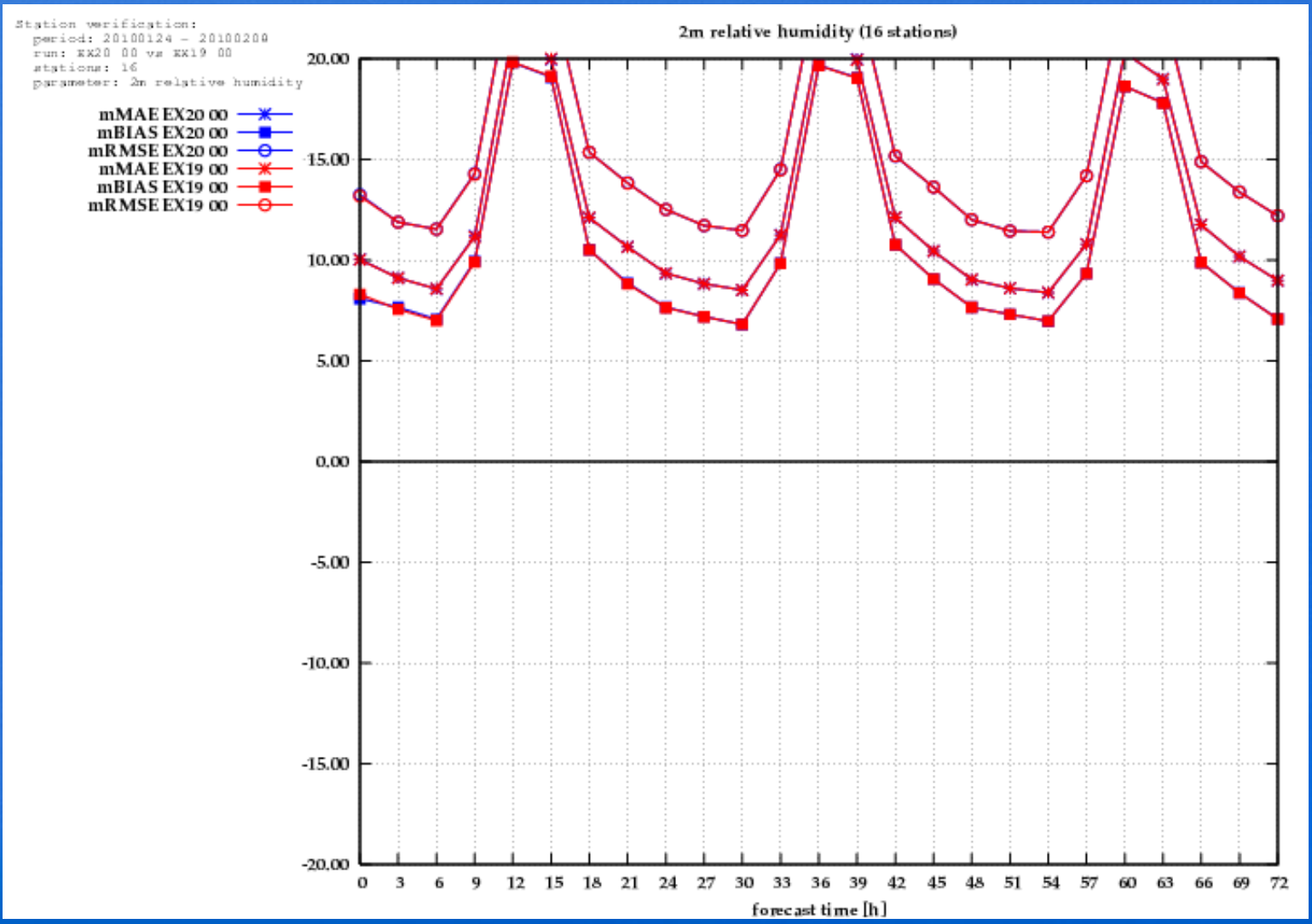
S: 0.90 vs 0.89

L: 0.34 vs 0.34

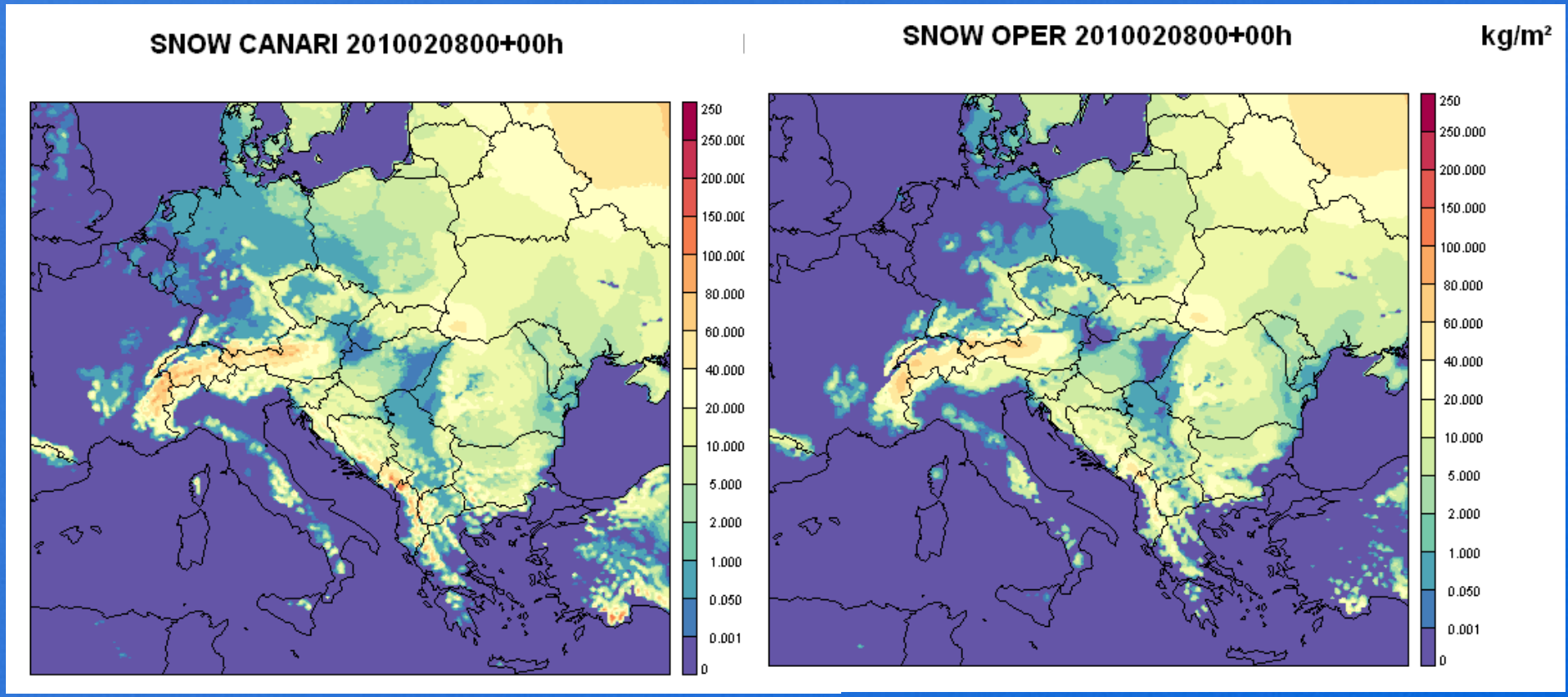
results : OPLACE (blue) vs OPLACE+TAWES (red)



results : OPLACE (blue) vs OPLACE+TAWES (red)



results : snow cover



More snow in CANARI due to relaxation towards climate file values.

CANARI

+ preoperational cycle is working since 2010
+ combined with 3DVAR
+ improvement for 2m & precipitation forecasts
+ tests with cy36t1 started

- snow cover in winter
- no long time verification for winter

Thank you for your attention!

stefan.schneider@zamg.ac.at

CANARI + 3DVAR I

Surface assimilation:

SYNOP+TAWES: T_{2m}, RH_{2m} (OPLACE/ZAMG database)

3D-Var:

SYNOP+TAWES: Φ, T_{2m} , RH_{2m} (ZAMG database)

SHIP: U, V, T, RH, Φ (ZAMG database)

TEMP: U, V, T, q, Φ (OPLACE data)

AIREP: U, V, T (OPLACE data)

Windprofiler: U, V (OPLACE data)

SAT (ATOVS, AMSU-A/B): Radiance (OPLACE data)

SAT (GEOWIND): U, V (OPLACE data)