Regional Cooperation for
Limited Area Modeling in Central Europe

LACE
nwp central europe

LACE in 2015

Yong Wang + many LACE colleagues

DHMZ SHMÚ OMSZ ZAMG ROMANIA ANM

Organisational: change

Programme Manager: Yong Wang

- **Area Leaders:**

  Dynamics & Coupling: Petra Smolikova

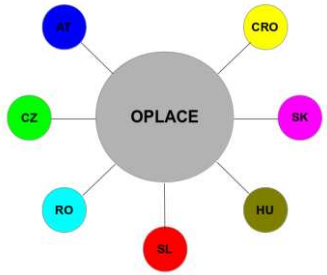
  Physics: Neva Pristov

  Data Assimilation: Mate Mile

  Predictability: Martin Bellus (Theresa Gorgas)

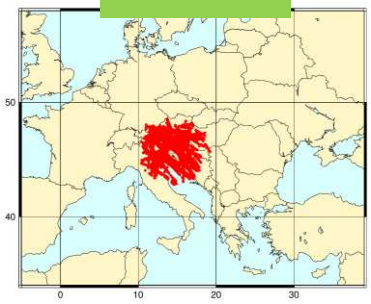
- **Data Manager:** Alena Trojakova
- **System Coordinator:** Oldrich Spaniel
- **Climate Project manager:** Gabriella Szepszo
- **Administration and Finance:** Andrea Sigl

Common operations

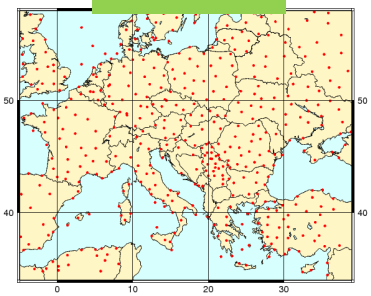


- OPLACE: The common Observation Pre-processing for LACE DA and Verification: SYNOP, TEMP, AMDAR, AMV, Wind profilers and radiances (SEVIRI, AMSU-A/B, MHS, HIRS, IASI)

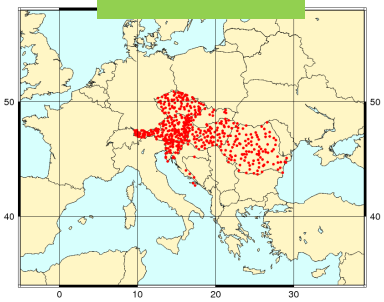
Mode-S

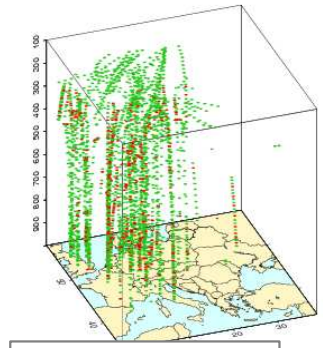


SYNOP



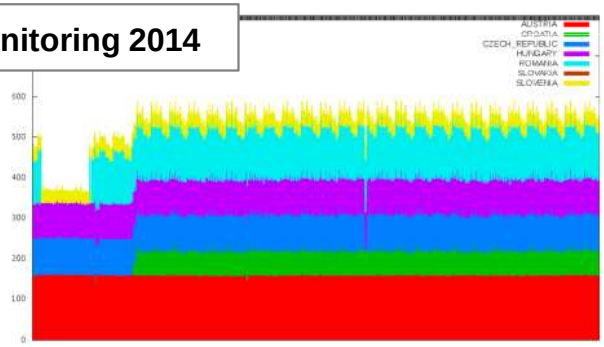
National



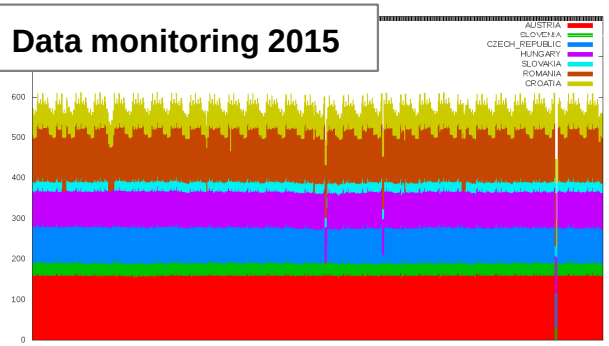


AMDAR reports

Data monitoring 2014



Data monitoring 2015

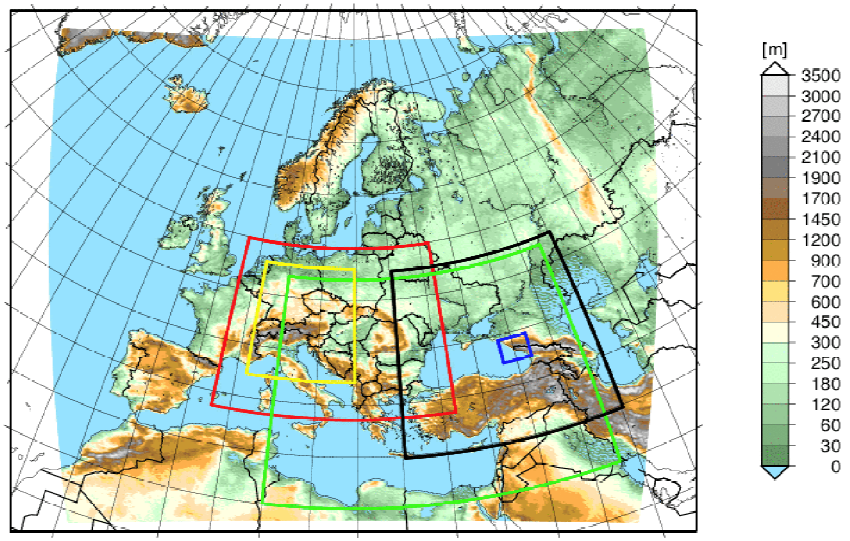


Deatils at Mate‘s talk

Common operations

- ALADIN-LAEF: no change, experiments 06/18 UTC coupling

Ensemble size	16+1
Horizontal resolution	11km
Vertical resolution	45
Runs/day	2
Forecast range	72h
Coupling	ECMWF EPS time lagged



Initial perturbation	Blending
Model perturbation	multi-physics
Initial surface perturbation	ensemble DA

Details at Martin‘s talk

LACE DA status

AROME(2.5) *Austria*
3DVAR+OI_main, 1h RUC

0 3 6 9 12 15 18 21

ALARO(8) *Croatia*
3DVAR+CANARI

0 6 12 18

ALARO(4.8) *Austria*
IFSDSC+CANARI

0 6 12 18

ALARO(4.9) *Czech Rep.*
BlendVAR

0 6 12 18

AROME(2.5) *Hungary*
3DVAR+ALDDSC

0 3 6 9 12 15 18 21

ALARO(6.5) *Romania*
3DVAR+CANARI (exp)

0 6 12 18

ALARO(8) *Hungary*
3DVAR+CANARI

0 6 12 18

ALARO *Slovakia*
Blending+CANARI

0 6 12 18

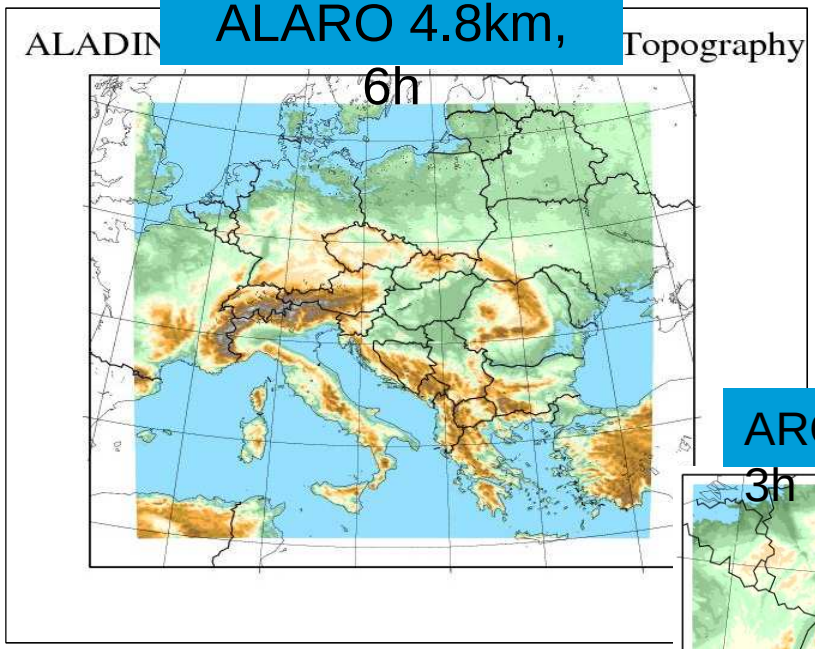
ALARO(4.4) *Slovenia*
3DVAR+CANARI

0 3 6 9 12 15 18 21

Details at Mate's talk

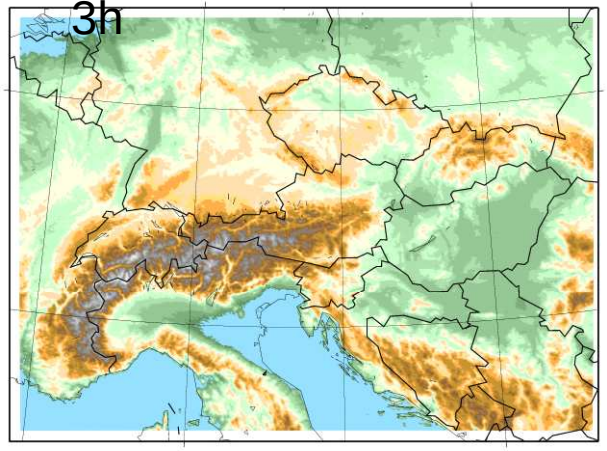
R&D highlights in DA

ALARO 4.8km, 6h

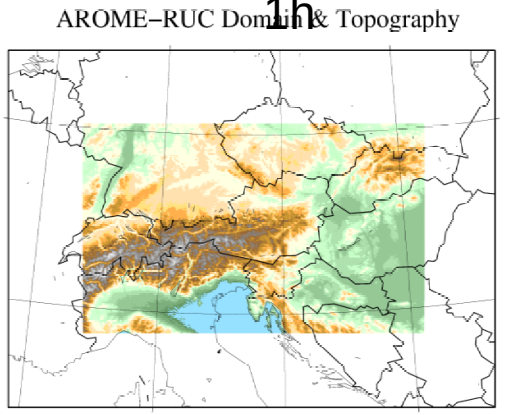


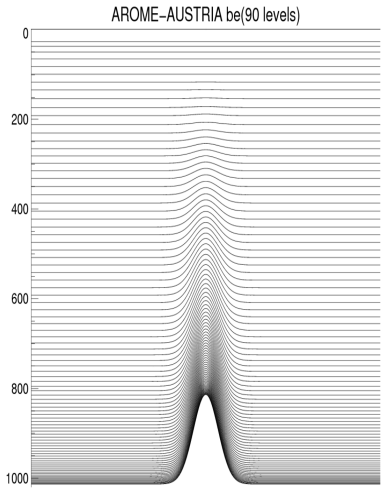
AROME 1h RUC for nowcatsing

AROME oper 2.5km, 3h



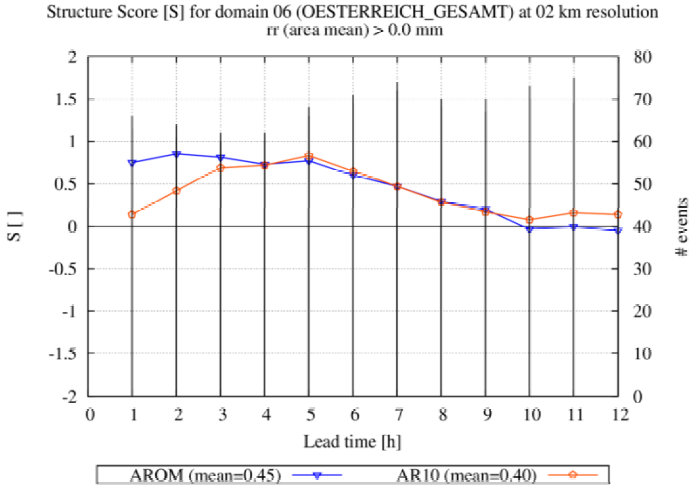
AROME RUC 2.5km, 1h

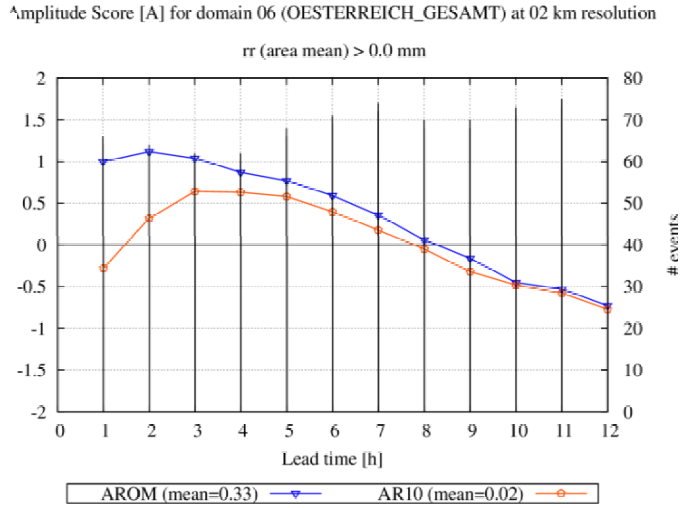


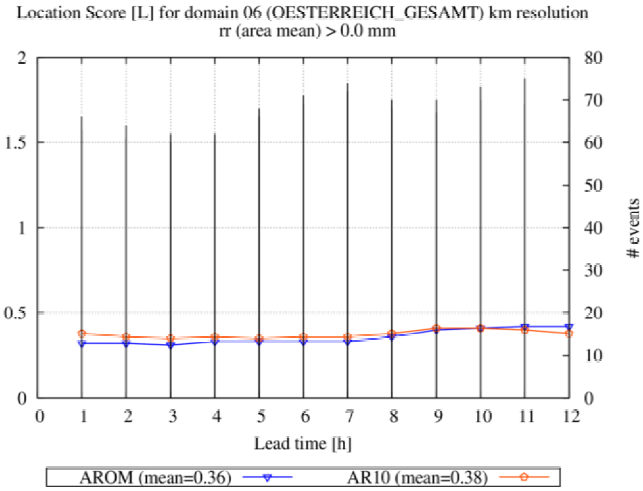


R&D highlights in DA

Verification: 2nd June-20th August 2015

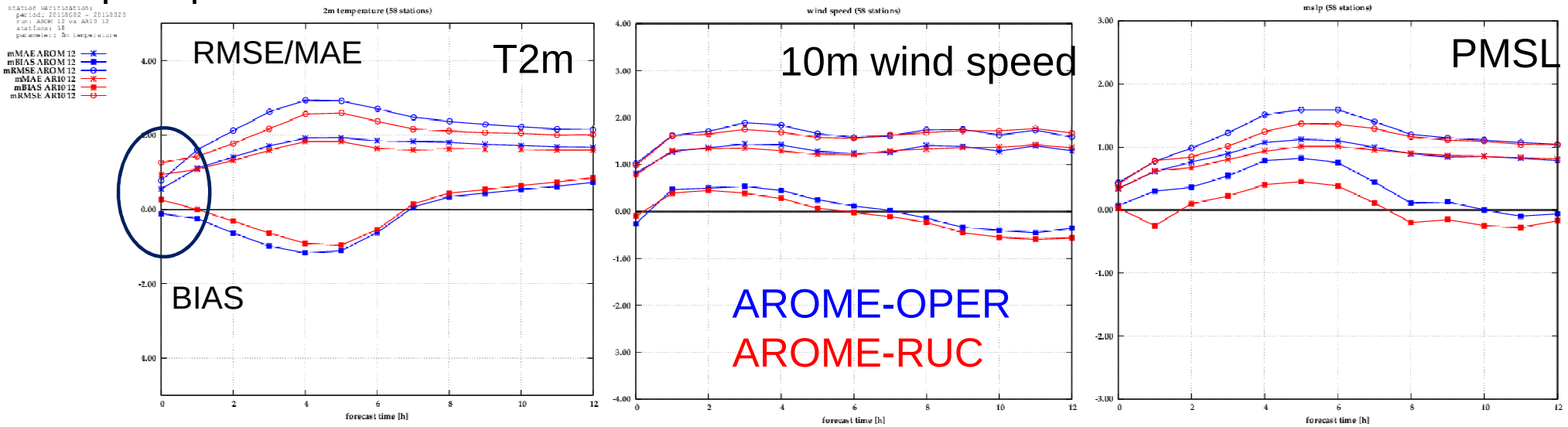






precipitation: SAL

AROME-OPER AROME-RUC



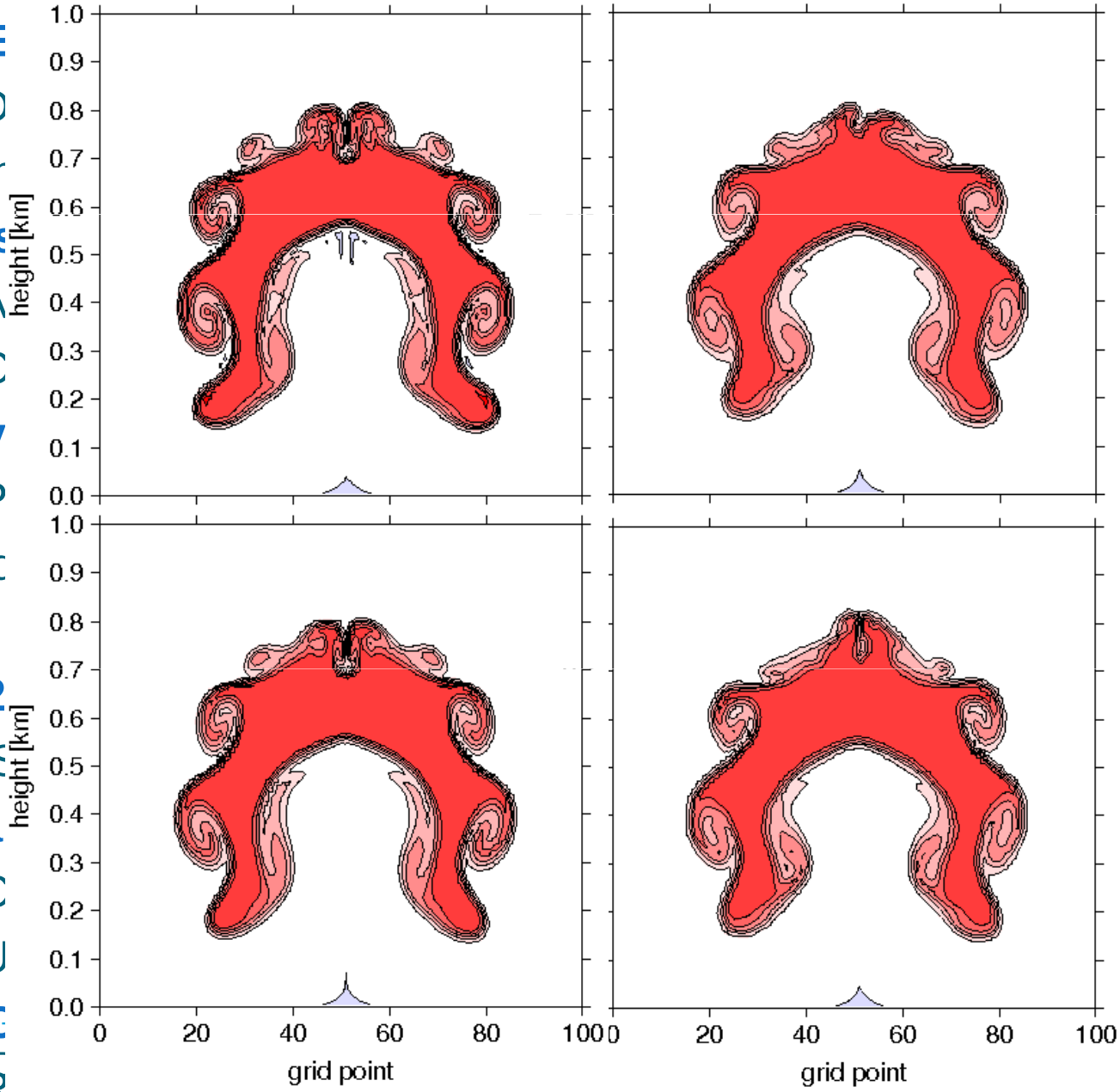
AROME RUC forecaster verification

Positive +	Negative -
Realistic pattern of convective precipitation in time and space	Difficulty for exact feature in very local scale
High predictability for initiation of primary convection in place and short forecast time (1-2h)	Low predictability for secondary convection (often in flat area)
Thurderstorm developement around 6h forecast rather reliable	First 2~3 hours spin up.
Realistic averaged wind speed and gust (if no convection)	Strong overestimation of convective wind gust
No remarkable Rainfall overestimation over mountain, often related to the primary convection	Clear rainfall overestimation in flat area, often related with secondary convection
	Serious problem with unidentified clutter in radar data in some cases

Insgesamt bin ich sehr angetan von der ersten Testversion von AROME-RUC und glaube, dass es noch eine ganz tolle Sache wird!

R&D highlights in DYN

1. **VFE**
   - D
     m
2. **SL s**
   - A
   - C
3. **Phy**
   - P
   - Ic
     d
4. **1D2**
   - S
5. **Eva**
   - C
   - U
6. **LBC**
   - R

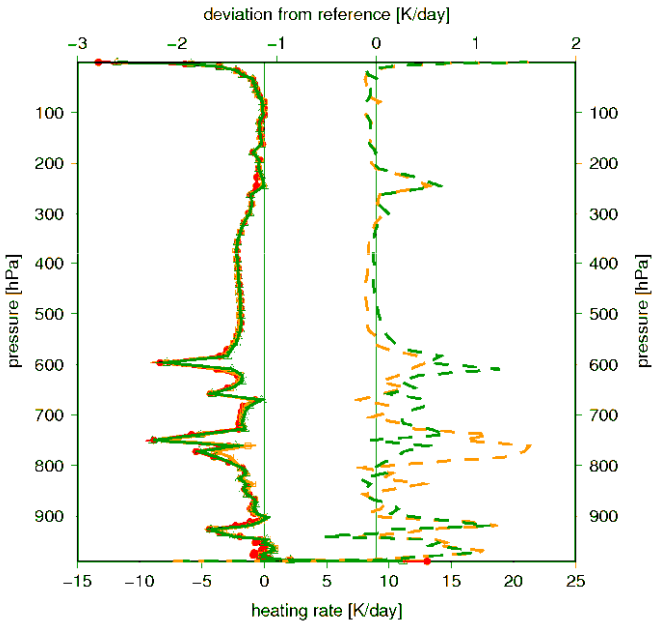


R&D highlights in PHY

- ALARO-1 status (10km – 1km): The operational ALARO-I has been ready!

DEVELOPMENT: TOUCANS (computation of shallow convection cloudiness),

ACRANEB2 (implementation of narrow band model for LW validation), updates of complementary sub-grid (up & down) drafts, and tuning of un



ALARO-1:

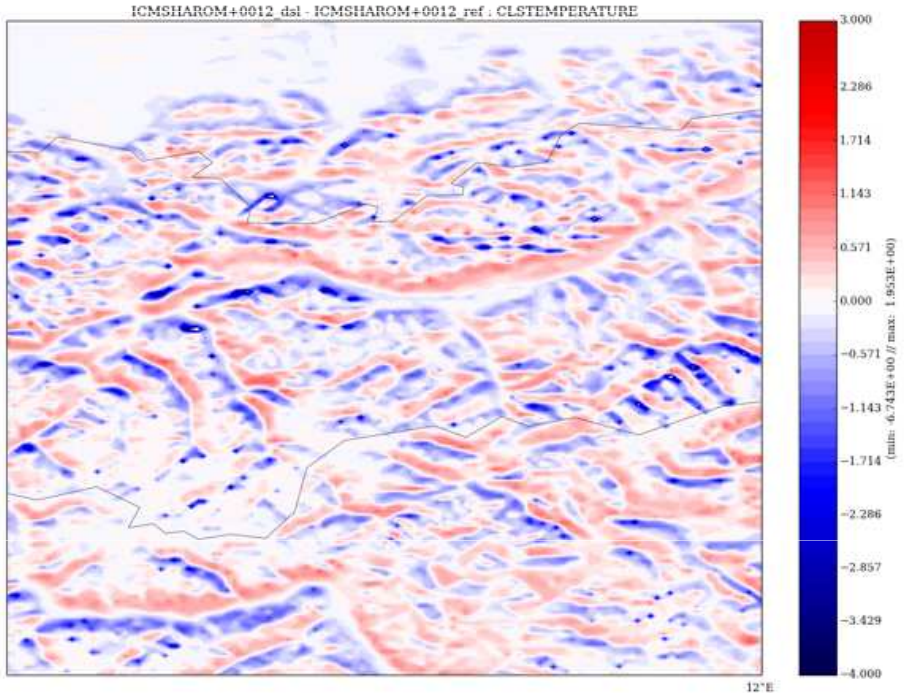
- pTKE with SURFEX
- TOUCANS with SURFEX Same stability functions at upper air and at surface
  - Modifications are done and tested
  - validation

Details at Neva‘s talk

R&D highlights in PHY

Differences for T 2m between AROME with orographic radiation parameterization and AROME reference for sunny day at 12UTC on zoom around Innsbruck

Parameterization of orographic effects (shadow, slope and sky view) on radiation

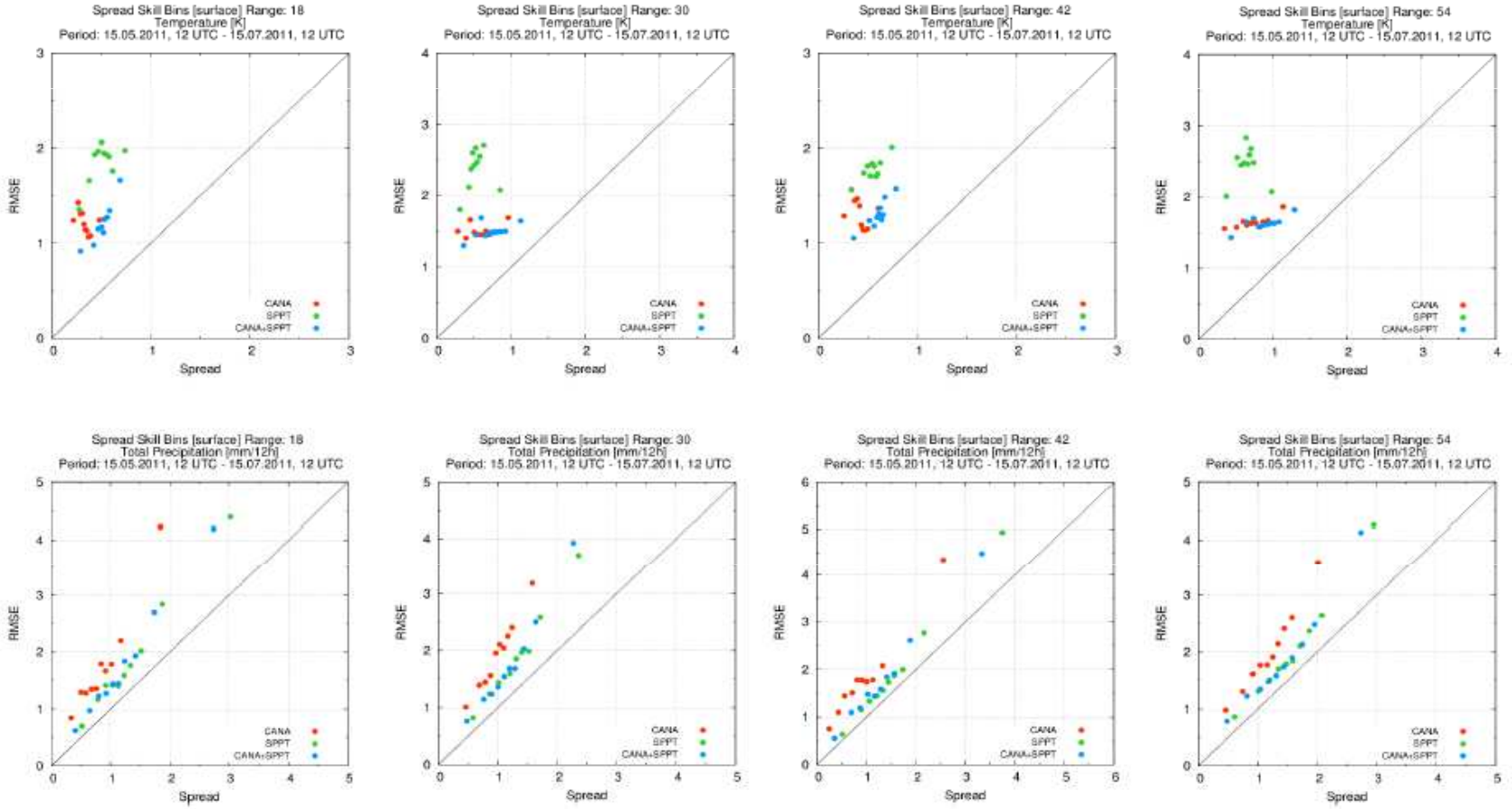


A very realistic slope effect

Details at Neva‘s talk

R&D highlights in EPS

Ensemble of surface data assimilation, SPPT, and combination



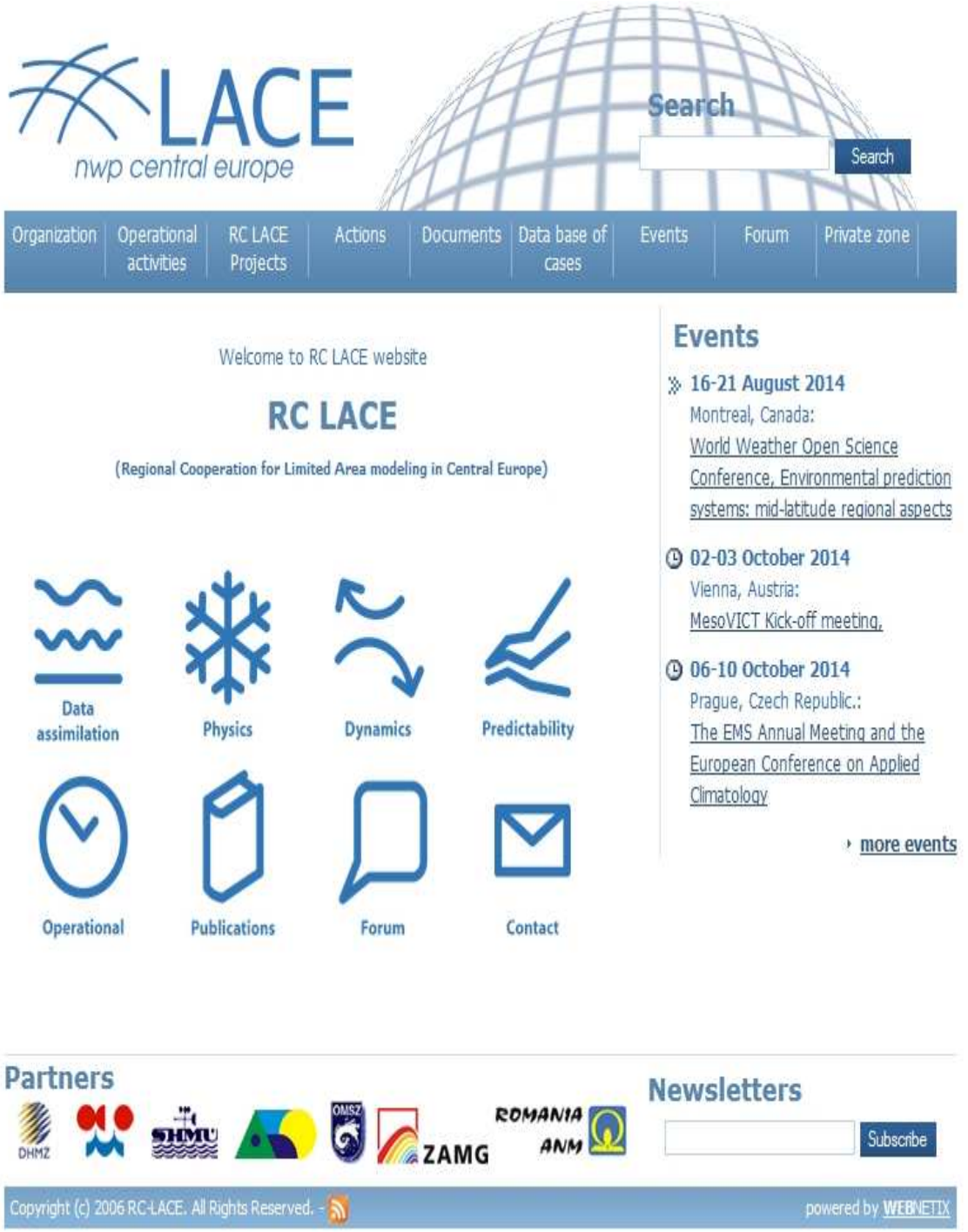
Spread Skill *for the verification bins for* ***T2m*** *(top) and* ***12h accumulated precipitation*** *(bottom) valid at* ***+18***, ***+30***, ***+42*** *and* ***+54h***, *computed from 62 days experiment with* ***CANA***, ***SPPT*** *and* ***CANA+SPPT***.

Details at Martin‘s talk

For the next future

- focusing on AROME/ALARO at 1 -- 2.5km scale
- designing LACE future model systems, VFE, ALARO
- further developing DA, 1h RUC, radar QC, DA
- upgrading LAEF, 5km, EN-DA, multi/stochastic PHY
- R&D on convection permitting EPS

Thanks!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World Weather Open Science Conference, Environmental prediction systems: mid-latitude regional aspects
02-03 October 2014
Vienna, Austria:
MesoVICT Kick-off meeting,
06-10 October 2014
Prague, Czech Republic.:
The EMS Annual Meeting and the European Conference on Applied Climatology
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