

*Regional Cooperation for
Limited Area Modeling in Central Europe*



News on research and development in ALADIN-LAEF

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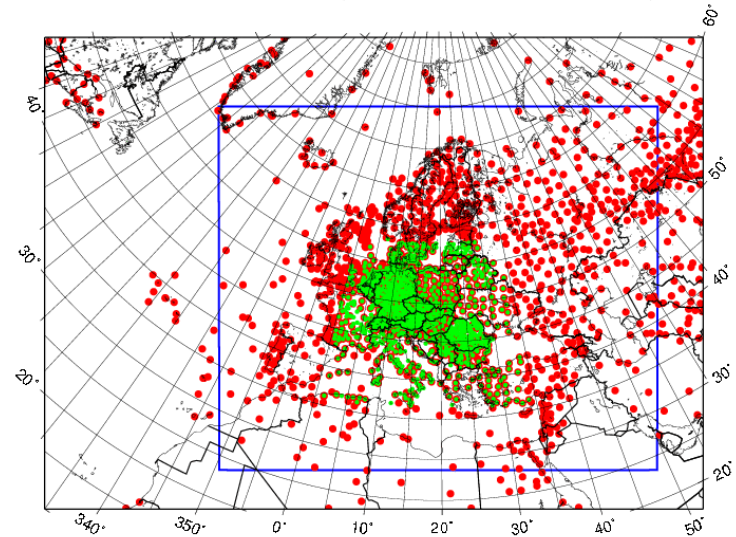


Upgrade of ALADIN-LAEF

April 16, 2013

| | |
|------------------------------|-------------------------------------------------|
| Ensemble size | 16+1 |
| Horizontal resolution | 11 km |
| Vertical resolution | 45 layer |
| Runs/Day | 2 (00, 12 UTC) |
| Forecast range | 72 h |
| Output-Frequency | 1h |
| Model time step | 450s |
| Coupling-Model (time-lagged) | <i>ECMWF-EPS (SV Vectors, first 16 members)</i> |
| Coupling-Update | 6h |

ALADIN-LAEF (domain and used OBS)



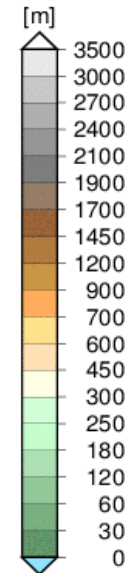
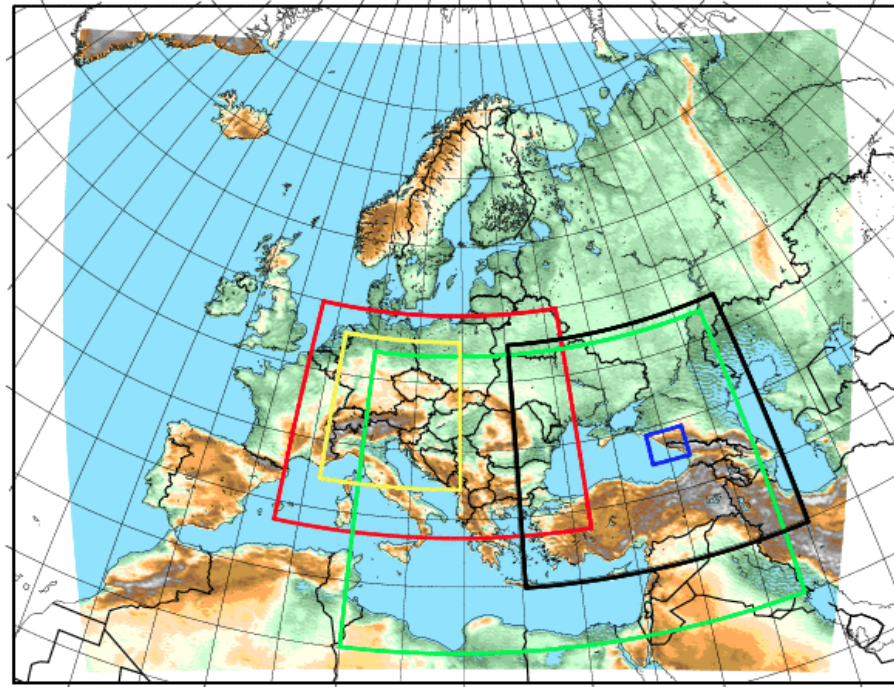
New LAEF domain covered by
OPLACE (red dots) and "local" AT
SYNOP observations (green dots)

Features of upgraded LAEF:

- Increased horizontal/vertical resolution
- Enlarged domain
- Initial conditions: Breeding-blending cycling
- Ensemble surface assimilation with perturbed observations
- Revised Multiphysics scheme

Upgrade of ALADIN-LAEF

April 16, 2013



LAEF_LACE
LAEF_TR
LAEF_ENINCA
LAEF_SOCHI
LAEF_INCA_SOCHI

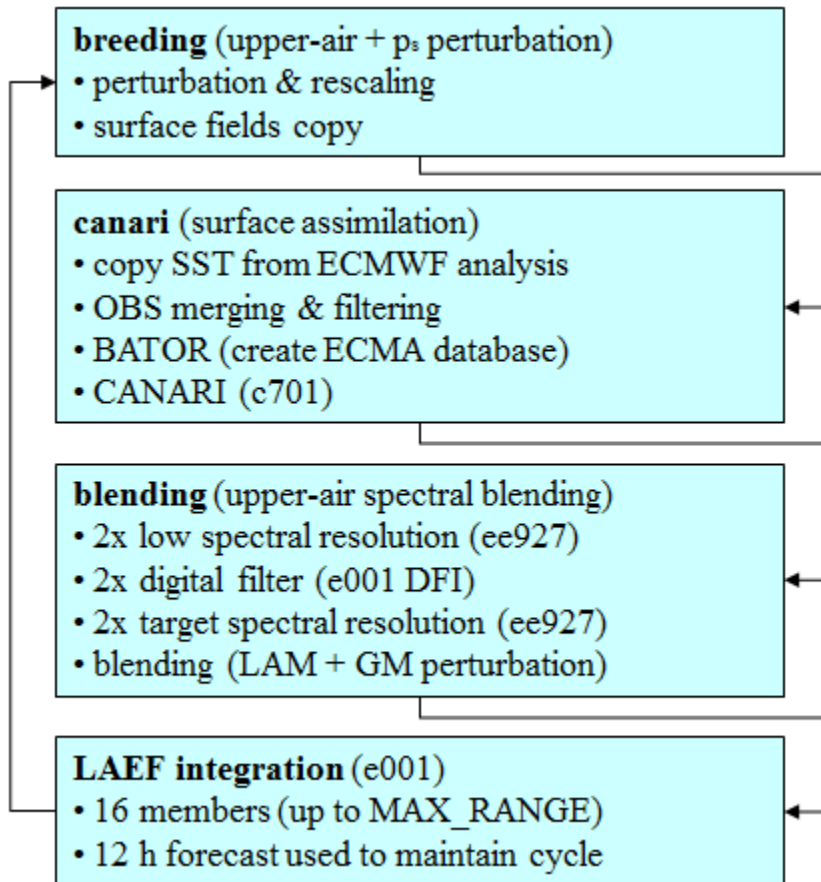
Time frame:

- MAR 2013: Start of E-Suite, error assessment, fallbacks...
- APR 2013: Regular production, evaluation...
- Summer 2013: Operational status

Upgrade of ALADIN-LAEF

April 16, 2013

Breeding-CANARI-blending cycle



Improved multiphysics:

16 different combinations of ALARO/ Meteo France ALADIN physics settings for microphysics, deep and shallow convection, radiation, turbulence, gusts, screen level parameters

Ensemble surface data assimilation:

Perturbation of surface observations according to observation errors for surface initial condition perturbations.

Preliminary evaluation of precipitation (SAL)

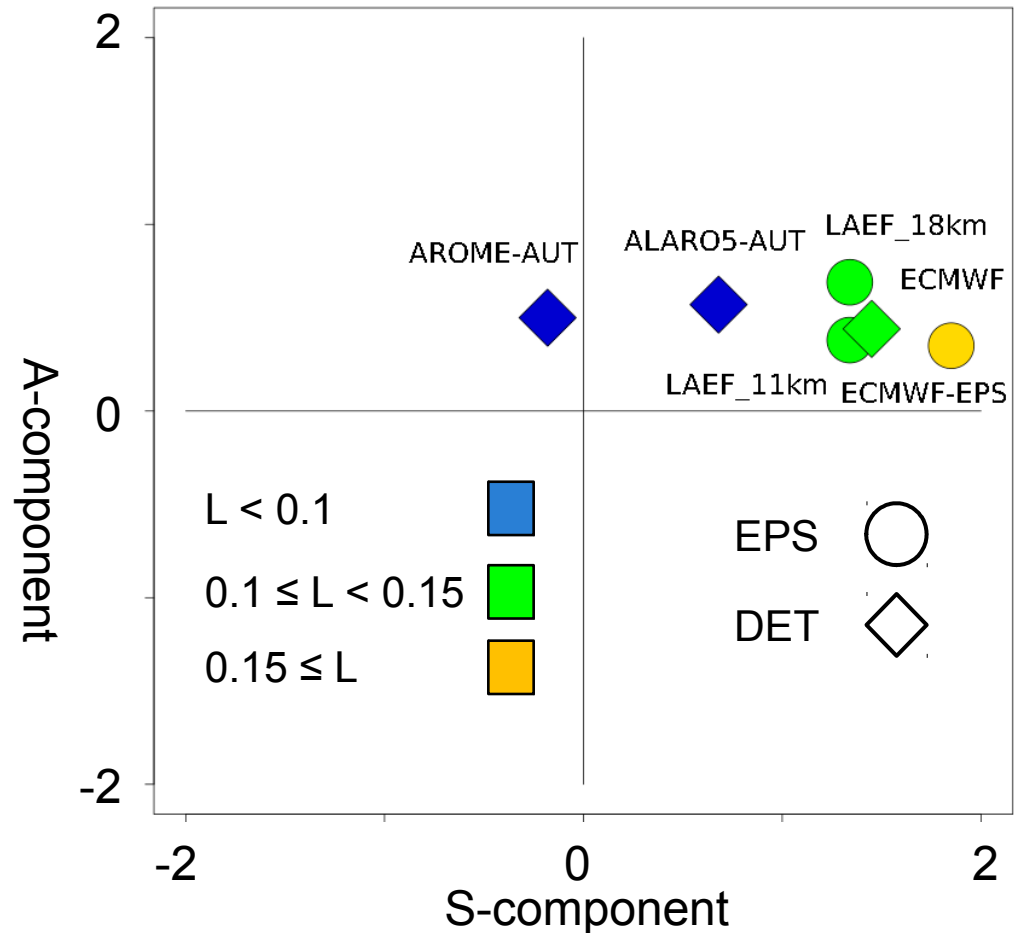
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Evaluation with 6-hourly
precipitation analysis of INCA
(Austrian INCA domain).

Period:
15 March – 10 April

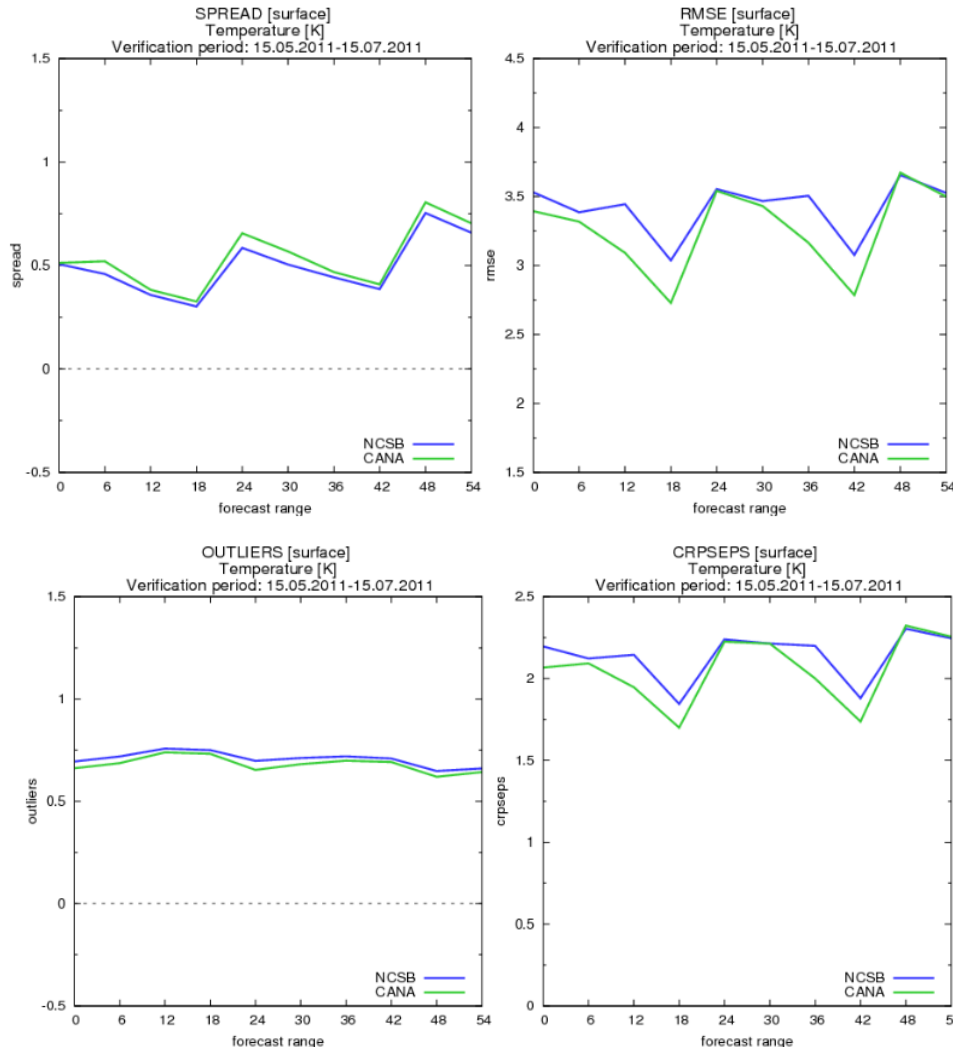
Lead times:
12-60 h (except for AROME)

- Amplitude of LAEF_11km improved compared to LAEF_18km
- Structure improved for large-scale and heavier precipitation



Evaluation of ensemble CANARI vs NCSB

April 16, 2013



Evaluation for a 2 month's period
(May-July 2011)

- NCSB: a perturbation of surface fields by 12h integration of ARPEGE surface driven by ECMWF EPS boundary conditions.
- CANA: Ensemble data assimilation cycle based on random perturbation of screen level observations within ODB and consecutive surface assimilation by CANARI configuration (no ARPEGE fields are used here).

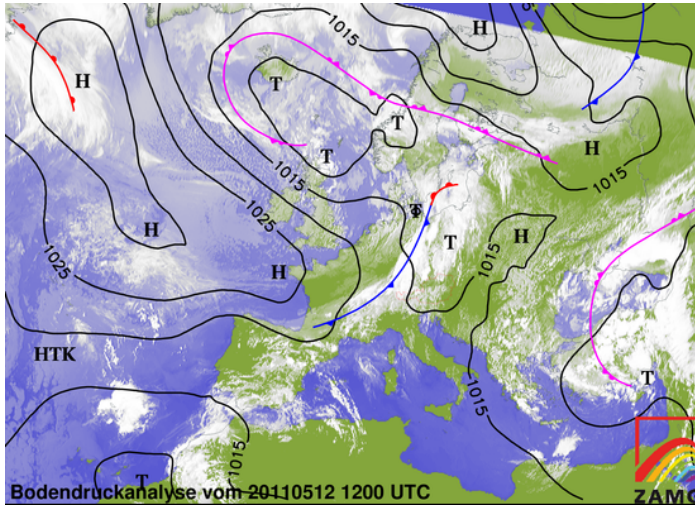
Overall better scores with CANA
than with NCSB



6

Comparison of coupling approaches

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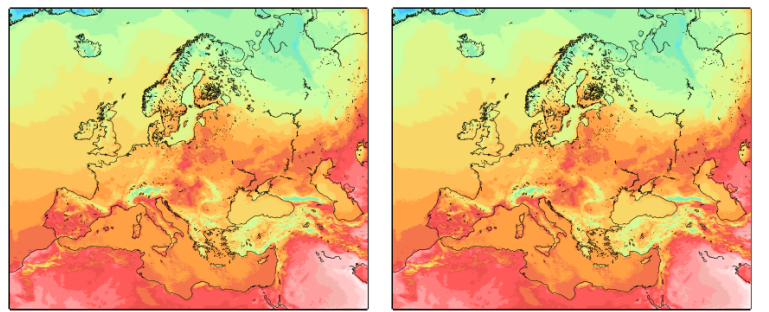


TCC - Time consistent: First LBC file from driving model

SCC - Space consistent: First LBC equal to INIT

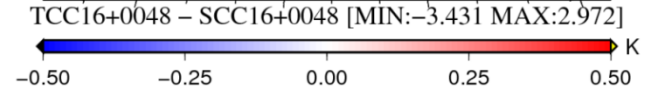
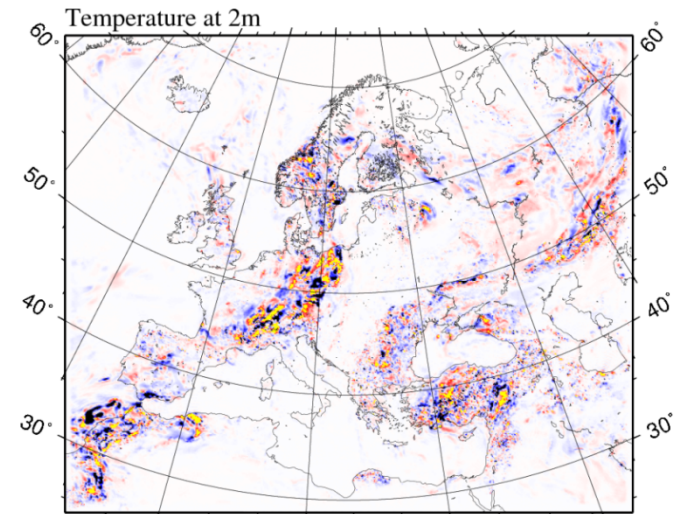
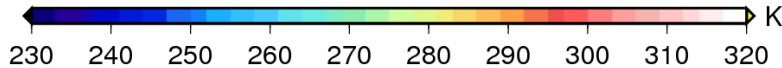
Some impact on case with frontal zone, but neutral in general

Temperature at 2m



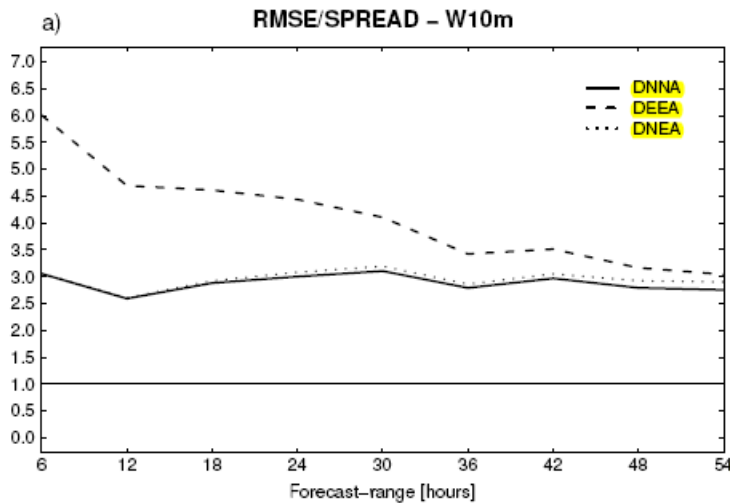
TCC16+0048

SCC16+0048



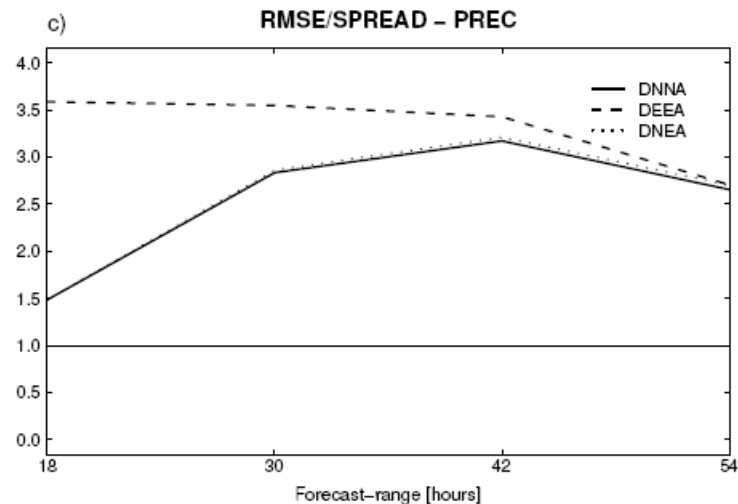
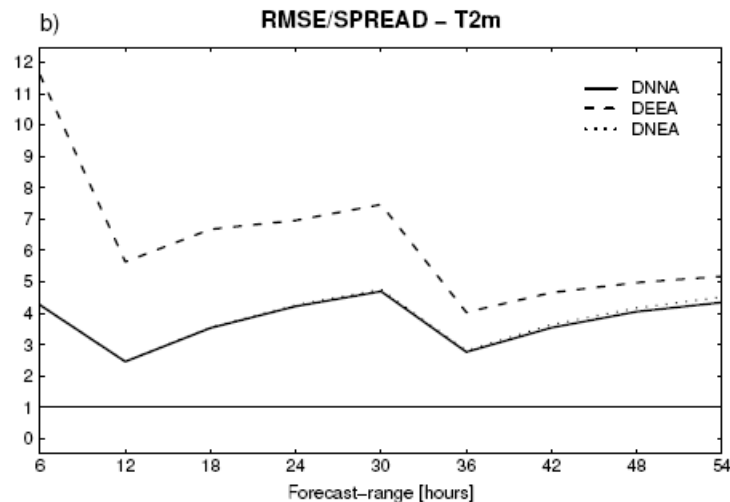
NCEP coupling vers. ECMWF coupling

April 15, 2013



Experiments (pure downscaling):

- DNNA : Downscaling with NCEP IC's and NCEP LBC's, using ARPEGE surface.
- DEEA : Downscaling with ECMWF IC's and ECMWF LBC's, using ARPEGE surface.
- DNEA: Downscaling with NCEP IC's and ECMWF LBC's, using ARPEGE surface.

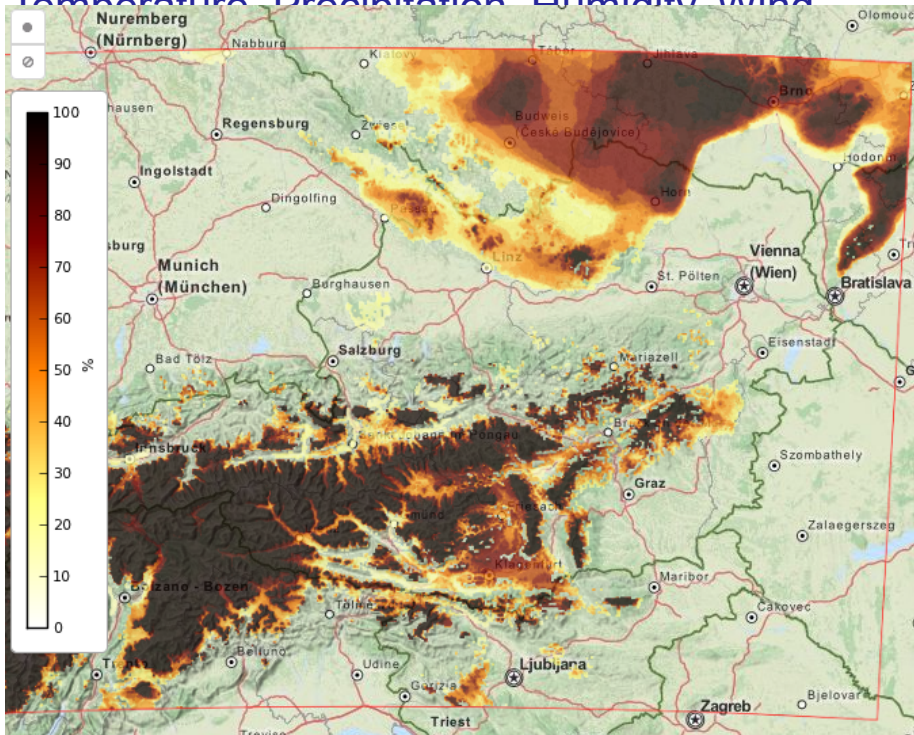


Applications of ALADIN-LAEF

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Input for Ensemble INCA

Downscaled probability charts on 1x1km for
Temperature, Precipitation, Humidity, Wind



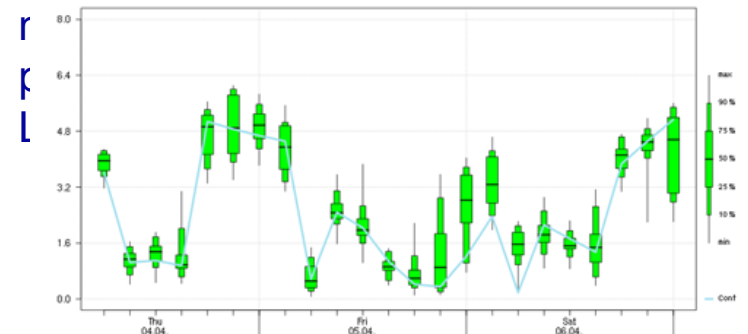
Probability of T2m < 0°C, 20130411 06 UTC

Products provided for FROST-14

Provide GRIB and XML output for the
Sochi area

Time series diagrams for selected locations

Input for INCA-Sochi



Wind speed for Krasnaya-Poliana

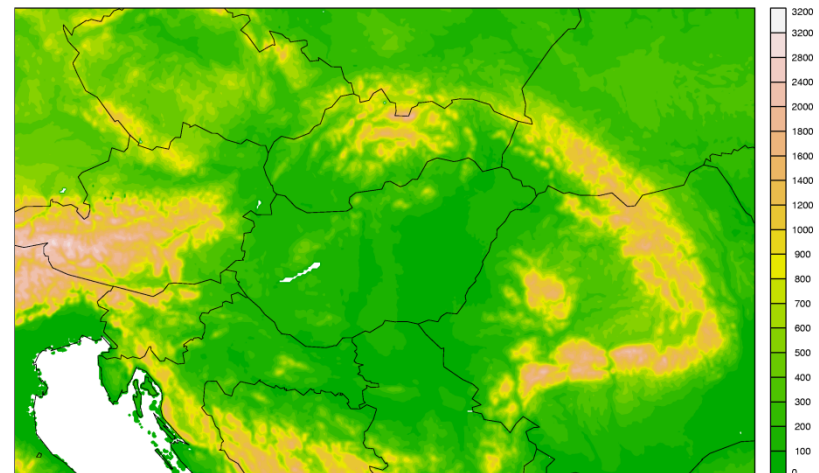
Towards an AROME-EPS for LACE

April 16, 2013

Experiences with AROME-EPS at OMSZ

- AROME-EPS coupled with PEARP
- Tests with PEARP downscaling vers. PEARP initial perturbations added to AROME 3DVAR analysis
- Tests with SPPT: Slight improvement for MSLP
- Comparison to operational LAMEPS ALARO-EPS 8km – AROME-EPS outperforms ALARO-EPS for surface parameters.

| | |
|------------------------|------------------------------------------------|
| Ensemble Size | 11 Members |
| Hor. Resolution | 2.5km |
| Grid points | 500*320 |
| Time Step | 60s |
| Time | 18UTC + 24h |
| Coupling model | PEARP (combined SV + EDA perturbations) |
| Coupling update | 3h |



Towards an AROME-EPS for LACE

April 16, 2013

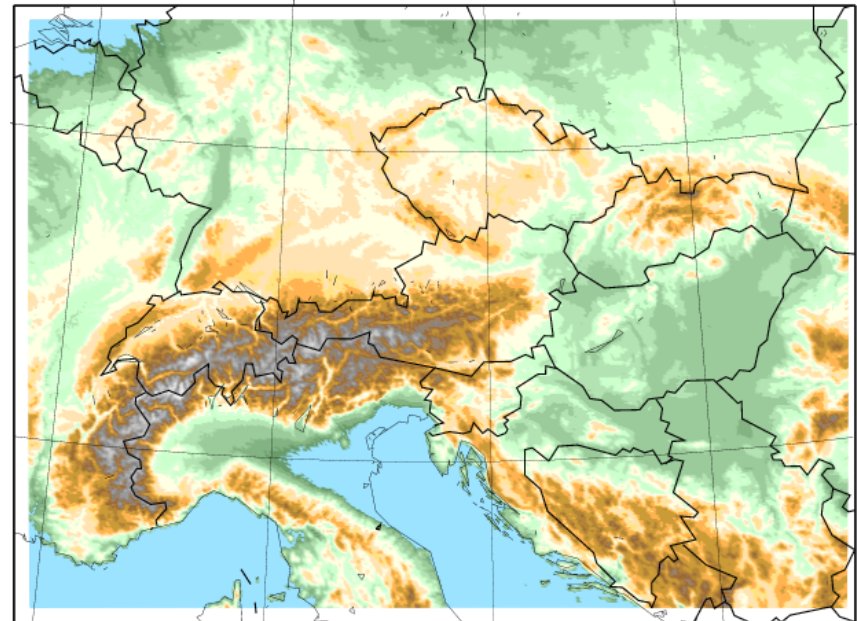
New domain specifications

- 600 x 432 grid points
- 2.5 km horizontal resolution
- 60 vertical levels

Tests planned

- coupling with ECMWF
- coupling with LAEF
- further studies with SPPT
- ensemble data assimilation

First set up planned in 2013
within close collaboration of
OMSZ and ZAMG



April 16, 2013



Takke fyrir athygli!