

*Regional Cooperation for
Limited Area Modeling in Central Europe*

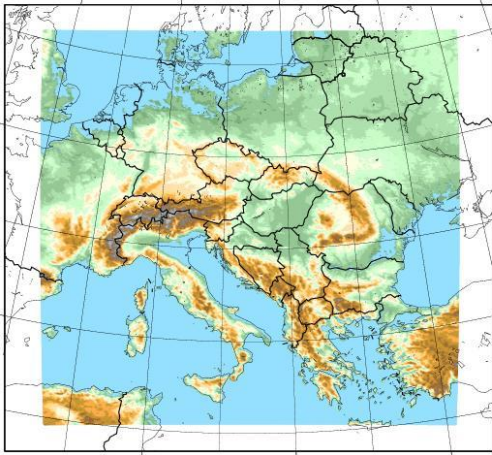


Status data assimilation in Austria

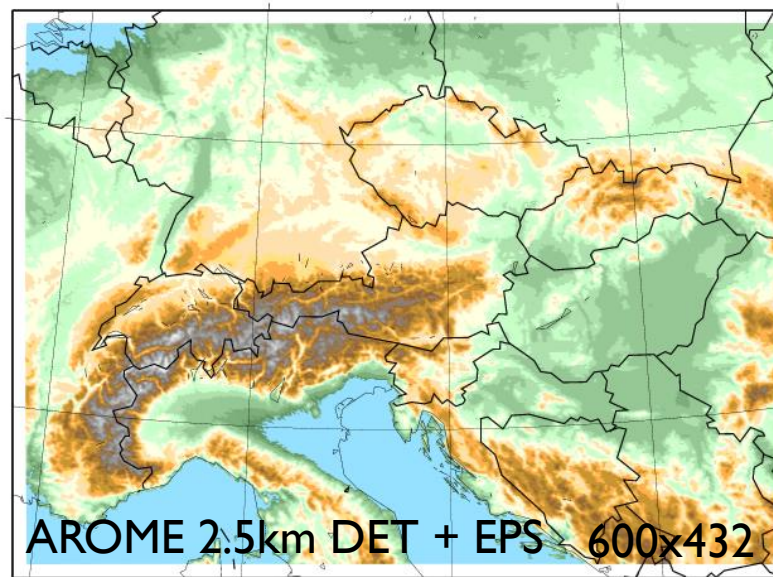
Florian Meier, Phillip Scheffknecht, Clemens Wastl, Florian Weidle, Christoph Wittmann, Stefan Schneider, Jasmin Vural



ALADIN-AUSTRIA 5km Domain & Topography

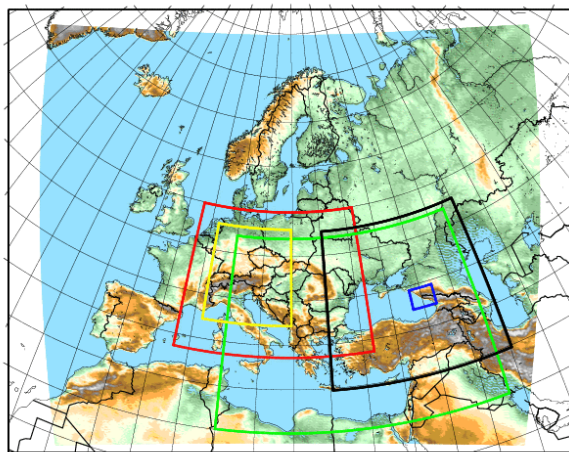


ALARO-0 4.8km 600x540

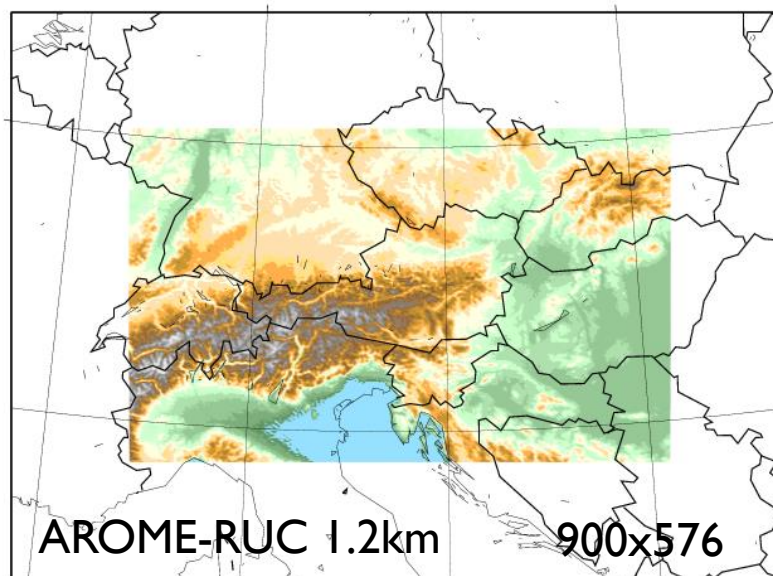
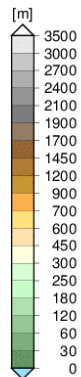


AROME 2.5km DET + EPS 600x432

ICE
urope



LAEF10.9km 500x600



AROME-RUC 1.2km 900x576



|



Operational configurations CMCs

Regional Cooperation for
Limited Area Modeling in Central Europe



ALARO-0 4.8km L60 cy40t1	AROME-2.5km L90 cy40t1	ALADIN-LAEF 10.9km L45/16+1 cy36t1 (LACE)	(AROME- EPS-2.5km L90/16 cy40t1)	(AROME-RUC 1.2km L90 cy40t1)
3h-IFS 4x/day +72h dt=180s	1h-IFS 8x/day +60h dt=60s	6h-IFS-EPS 2x/day +54h dt=450s	6h-IFS-EPS 2- 4x/day +48h dt=60s	1h-AROME 2.5km dt=30s
dynamical downscaling	3D-VAR	Breeding-blending	3D-Var-EDA-Jk	3D-VAR +LHN+FD DA-nudging
CANARI	CANARI- OIMAIN+MESCAN inline+ SNOW exchange/ SNOWGRID+SAT	CANARI-EDA offline	CANARI-EDA	CANARI- OIMAIN/downsc aling AROME (PREP offline)
DFI	-	-	-	IAU
	Static Ens-B from LAEF downscaling		Static Ens-B from LAEF downscaling	Static-Ens-B from AROME2.5km- EPS downscaling

Observations used AROME:

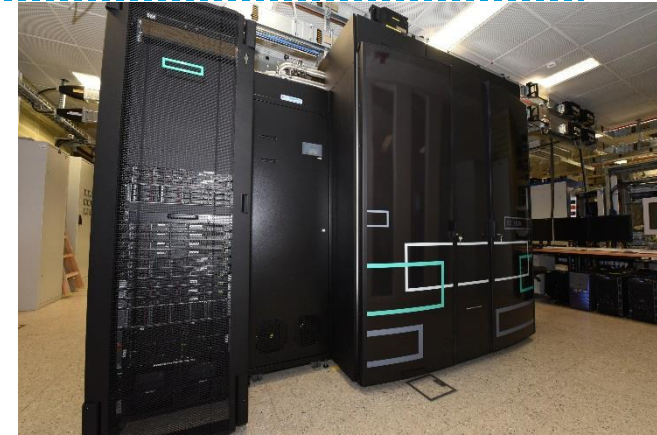
Obstype	Parameter
Synop+Tawes+Ship	U10m,V10m, RH2m,T2m, Z
AMDAR	U, V, T
GEOWIND	U,V (WVCLI/2,WVMWI, IR3,VIS3)
TEMP	U, V, T, Z, Q
PILOT	U,V
MSG-SEVIRI (Meteosat I I)	WV radiances
NOAA18/19/MetOp-A,-B	AMSU-A,AMSU-B, MHS, HIRS
MetOp-A	IASI
MetOp-A	U10m, V10m ASCAT ocean winds 25km

T_LAKE from Lake Constance from measurement interpolated inside OIMAIN

CANARI settings: REF_A=190km, LVARSIGO=F, LMESCAN=T, LCORRF=T
REF_S_T2=5.0,REF_S_H2=0.3,RCLIMCA=0.045,RCT2SY=3.9, RCH2SY=2.5
OROLIM=3800.,ORODIF=1650.

New super computer at ZAMG

- ▶ **HPE Apollo 8600 (=SGI ICE-XA)**
- ▶ 192 nodes with 18-core SKL 6140@2.4GHz
- ▶ 2 frontend nodes (à 2x8 processors, 64 GB RAM, ...)
- ▶ 96 GB RAM per node
- ▶ OmniPath enhanced hypercube network
- ▶ Lustre Filesystem with total capacity of 350TB
- ▶ PBSpro scheduling system
- ▶ The new HPE/SGI system replaced the old SGI ICE-X in December 2017.

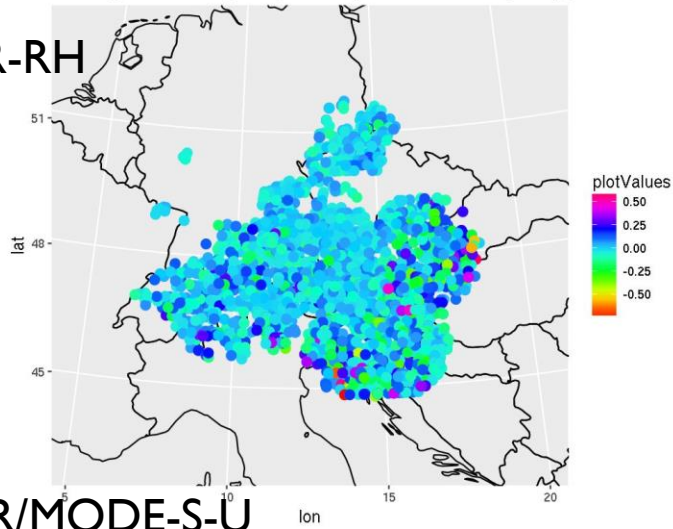


New unified scripting system for ALARO/AROME: ksh+bash+python

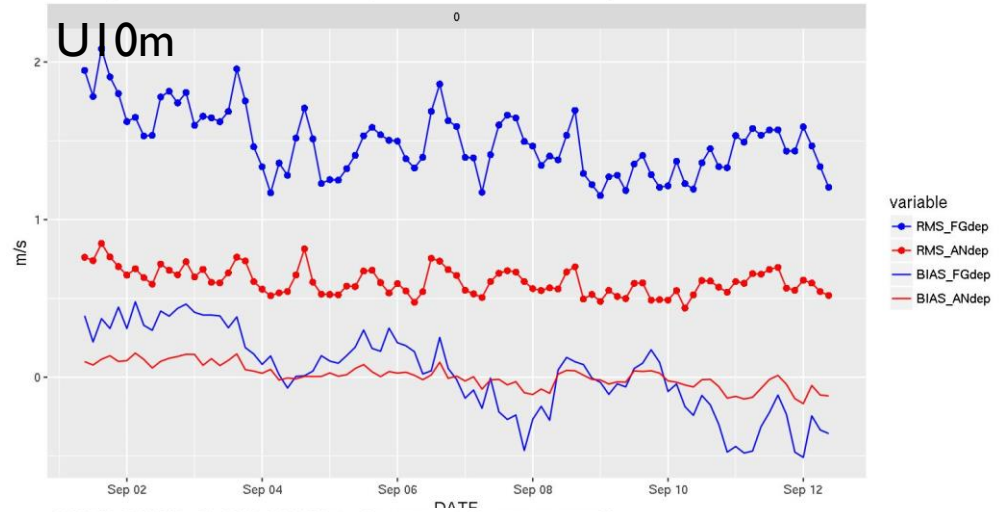
Installation of Harmonie-OBS-Monitor for AROME/AROME-parallel (F. Weidle)

AROME_ESUITE : AnalysisDepartureMap RADAR rh Level=(60000) [2018-09-01 09Z]

RADAR-RH
600hPa

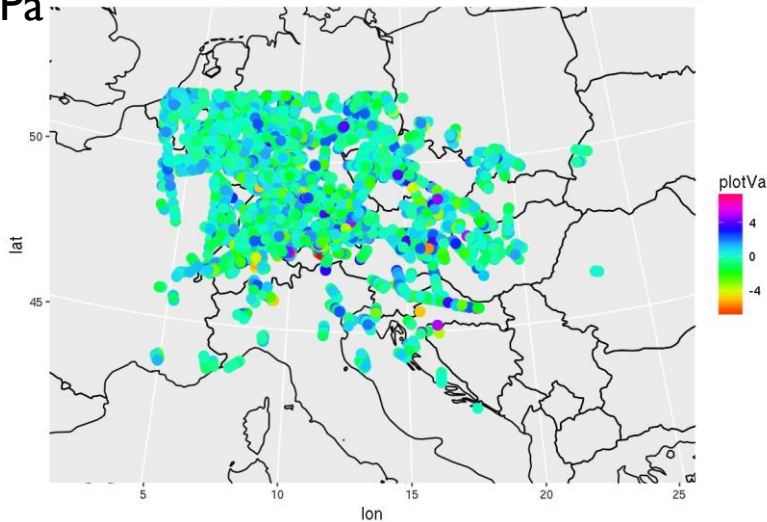


AROME_ESUITE : ObsFitTs SYNOP u10m [2018-09-01 09Z - 2018-09-12 09Z]

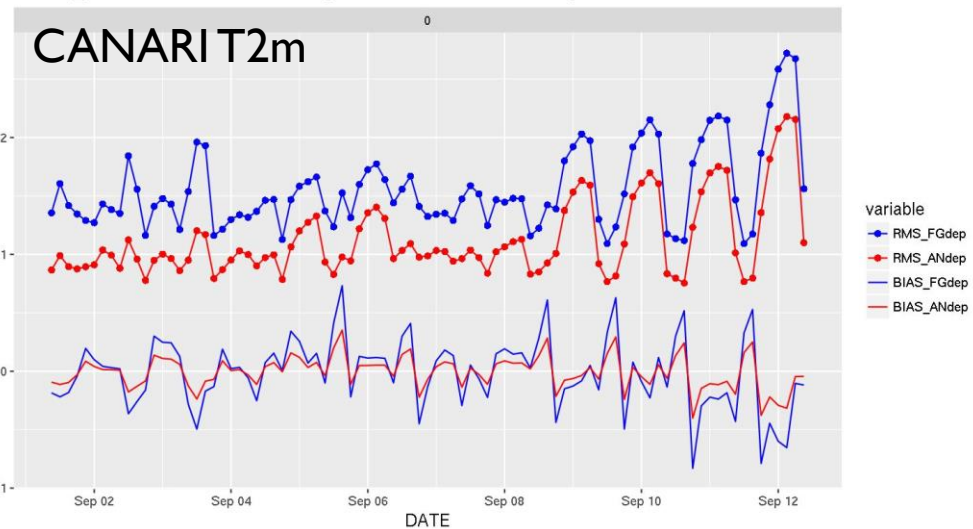


AMDAR/MODE-S-U
600hPa

AROME_ESUITE : AnalysisDepartureMap AIRCRAFT v Level=(60000) [2018-09-01 09Z]



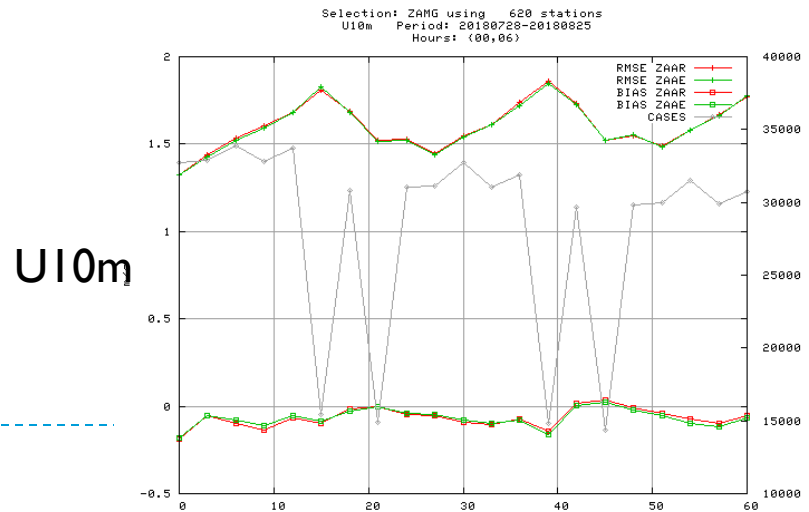
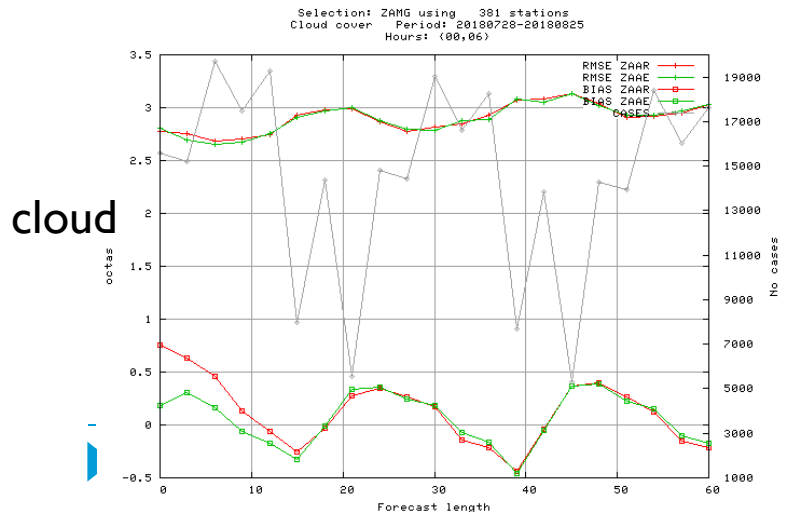
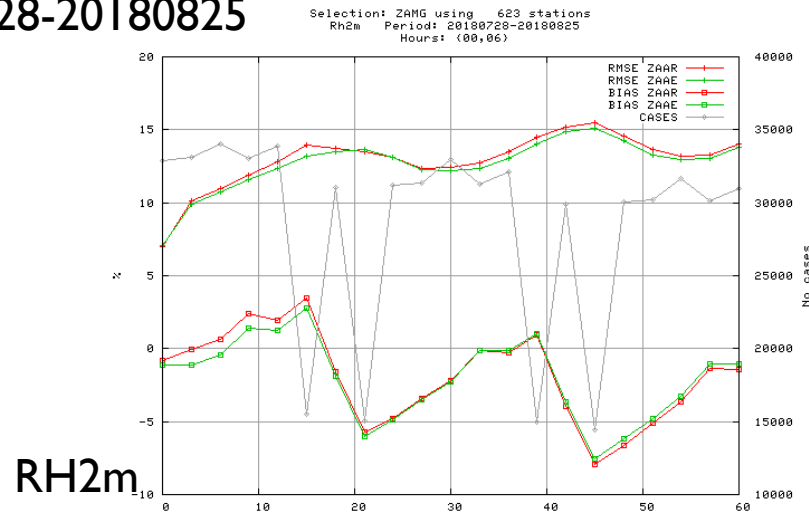
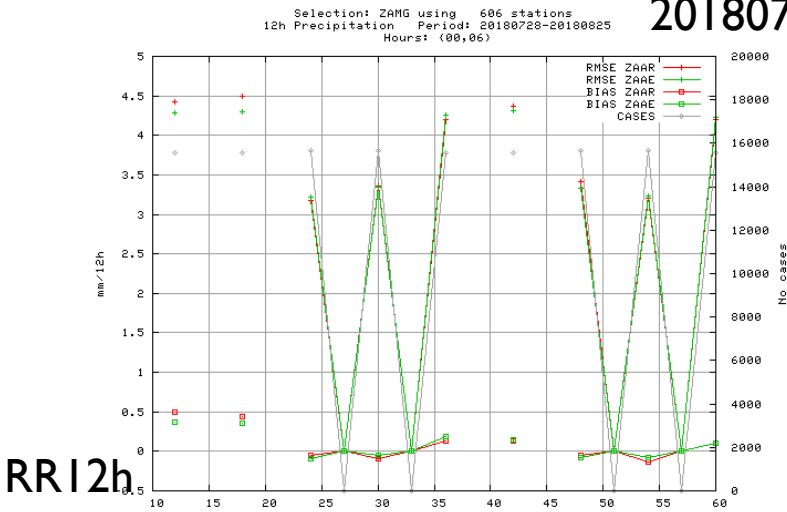
AROME_ESUITE : ObsFitTs SYNOP t2m [2018-09-01 09Z - 2018-09-12 09Z]



AROME-Parallel-Experiment

- ▶ Additional use of radar reflectivities from AT, Slovenia, Germany and MODE-S wind Slovenia, KNMI, national and AMDAR-Q -> now starting GNSS-ZTD

20180728-20180825

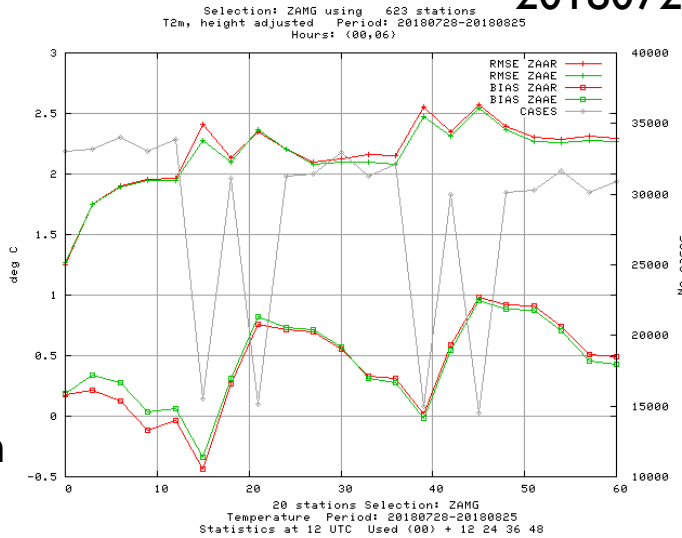


AROME-Parallel-Experiment

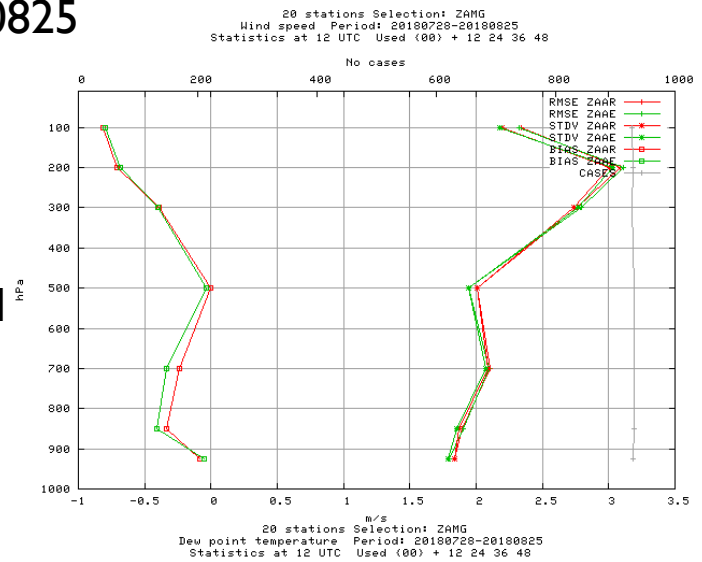
- ▶ Additional use of radar reflectivities from AT, Slovenia, Germany and MODE-S wind Slovenia, KNMI, national

20180728-20180825

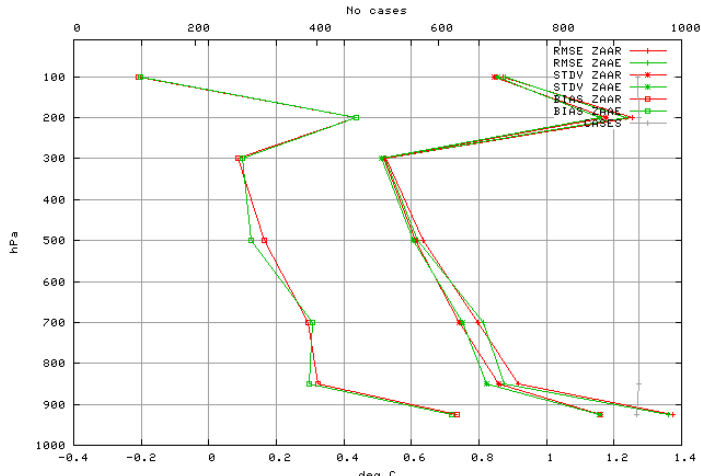
T2m



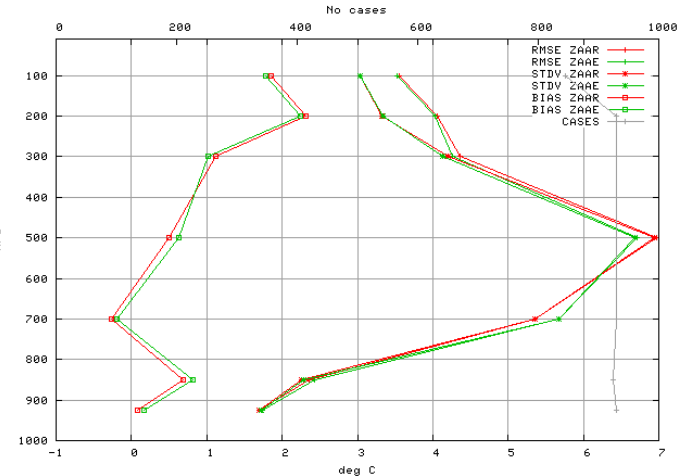
wind



T



Td

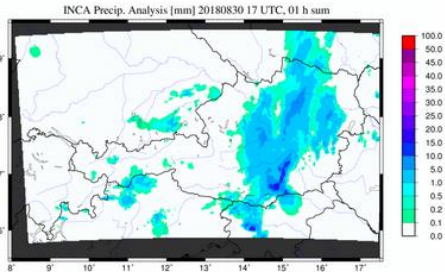


AROME-Parallel-Experiment

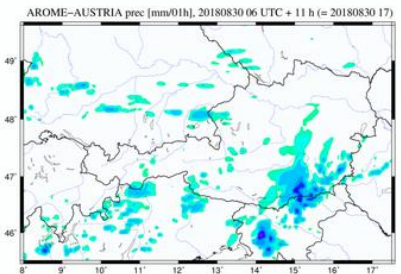
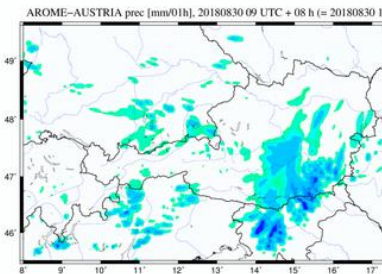
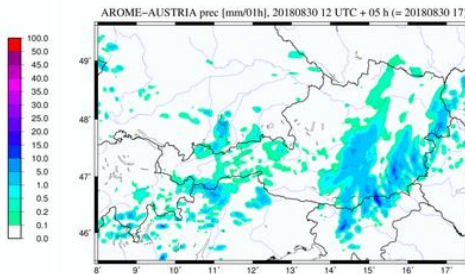
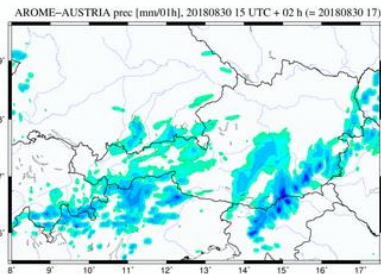
INCA

Analyse vom Thu, 30.08.2018 17:00 UTC

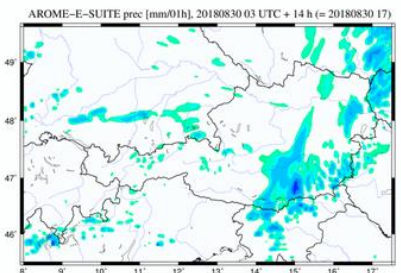
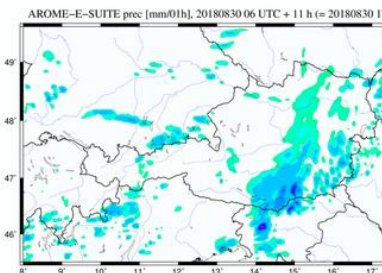
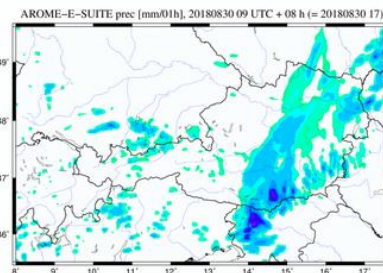
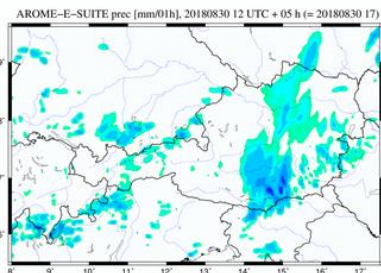
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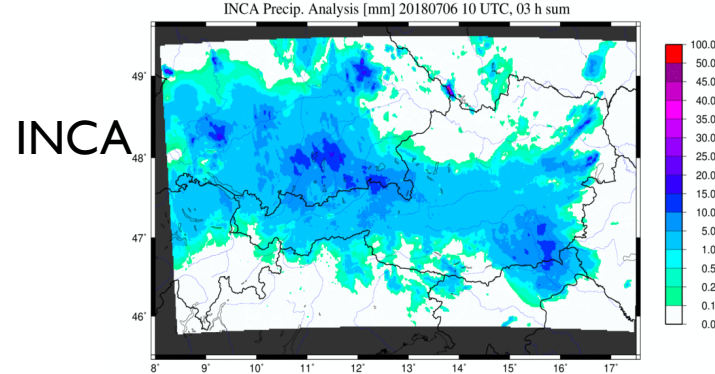


PARALLEL

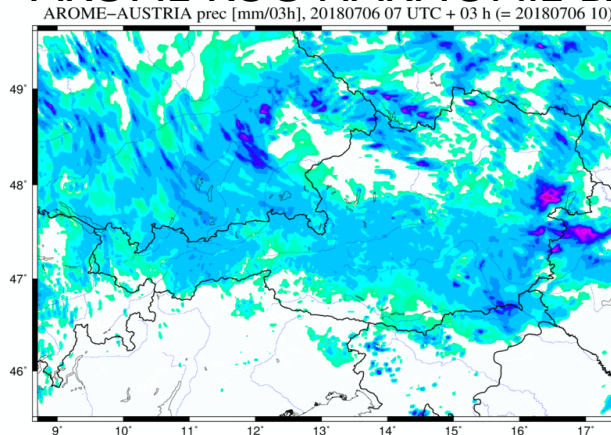


Modification of HARMONIE PREPOPERA

- ▶ Enable usage of MF-BATOR (interpolate quality index, copy attributes)
- ▶ Enable Romanian stations; add some missing station IDs
- ▶ Disable parallelisation (due to HDF5 library version)
- ▶ Take into account German stations' NAN elevations

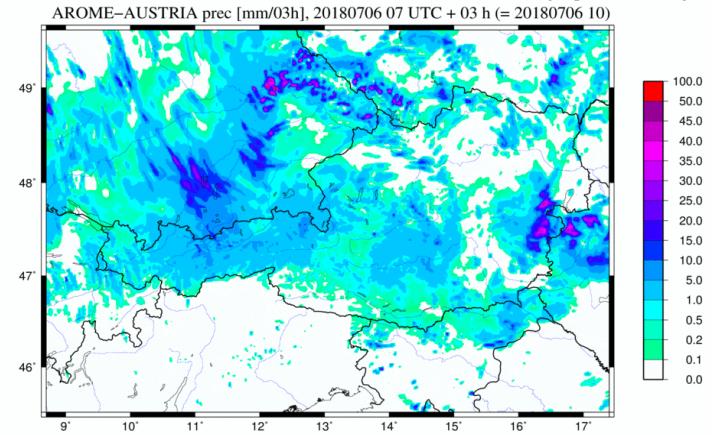


AROME-RUC-HARMONIE-BATOR modified



20180706 07UTC

AROME-RUC-MF-BATOR (cy40t1)



GNSS-activities

- ▶ gpssol for hourly 3D-Var modifications in source code
- ▶ GNSS ZTD in RUC2.5km July2016 + case studies 1.2km (master thesis university of Innsbruck)
- ▶ GNSS national data regular exchange established



- ▶ GNSS-RO: due to lack of observations OSSE planned
- ▶ comparison of ZTD and slant delays planned
- ▶ VARBC is not working in cy40t1 without code modifications?

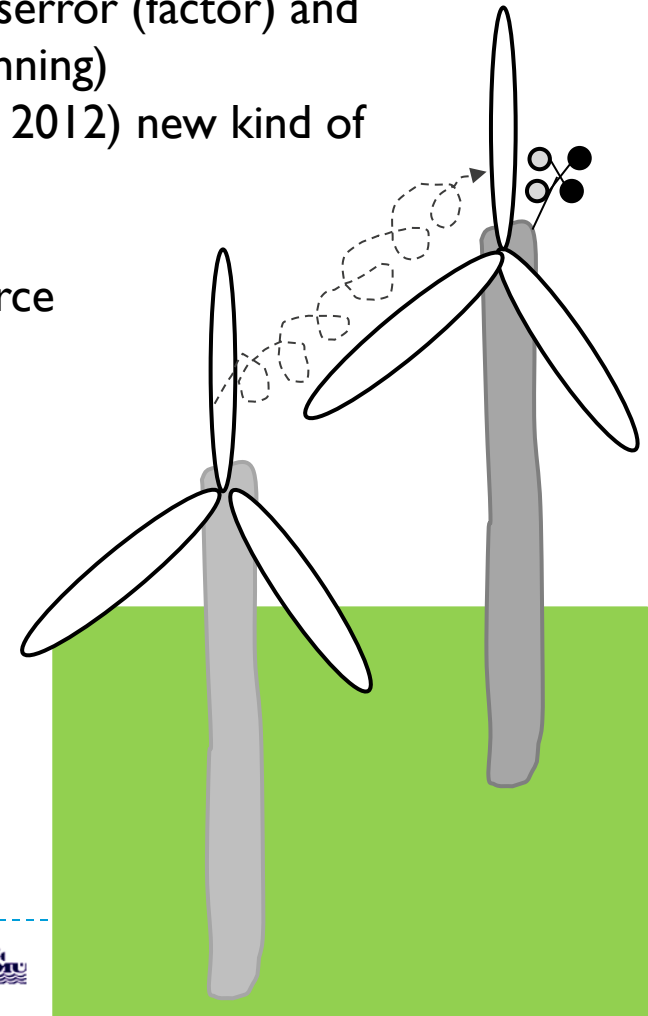
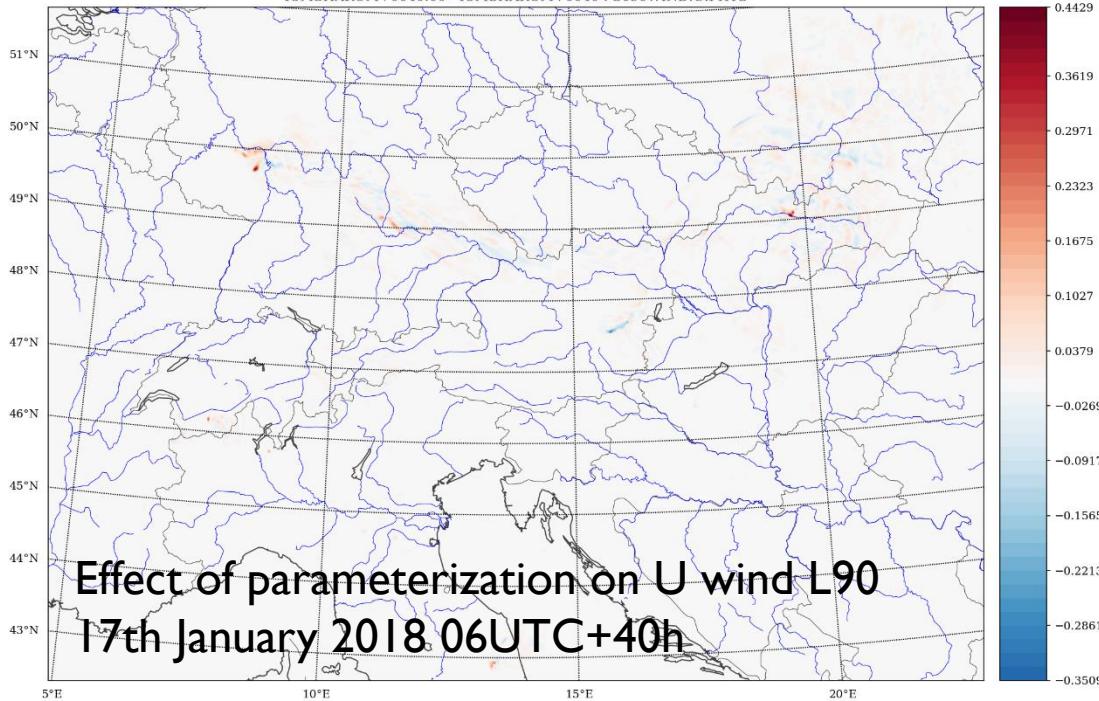
SCADA windturbine assimilation

Possible solutions:



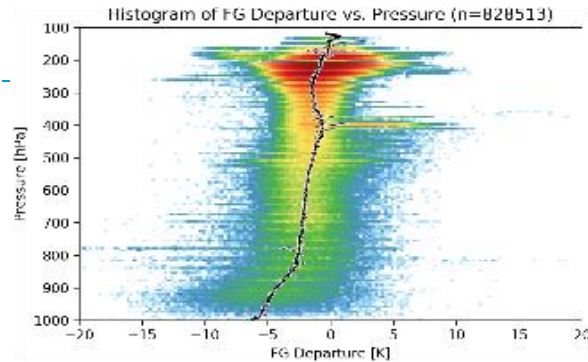
- Assimilate as obstype 6 (windprofiler) with modified obserror (factor) and simple QC checks (don't assimilate if windmill is not running)
- Parameterisation of windfarm effect on flow (Fitch et al. 2012) new kind of turbines added called from apl_arome
- data from Austrian wind farm (project ICE-CONTROL)
- activities will continue next year with different data source

ICMSHAROM+0040:00 - ICMSHAROM+0040 : S096 WIND.U.PHYS

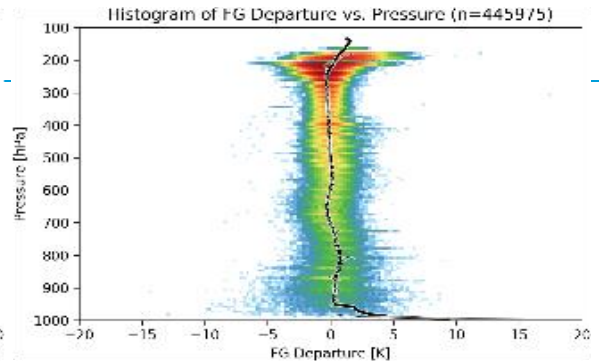


national MODE-S EHS data
from Austrian ATC
(P. Scheffknecht)

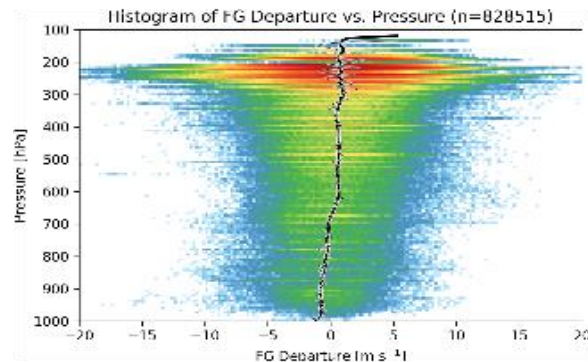
quality improved



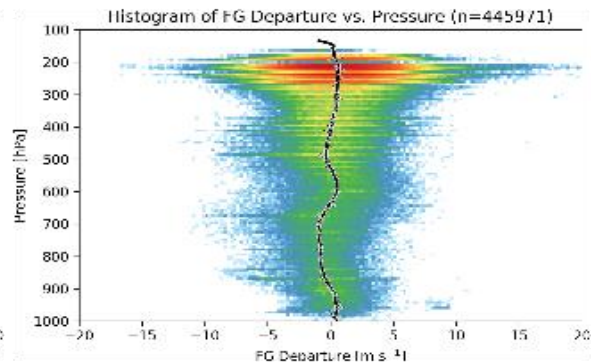
(a) histogram for T, 2017-07-10



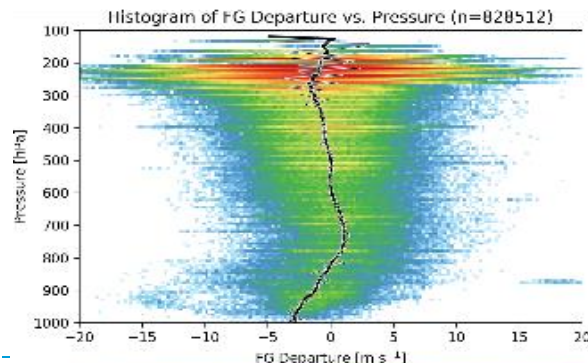
(b) histogram for T, 2018-05-02



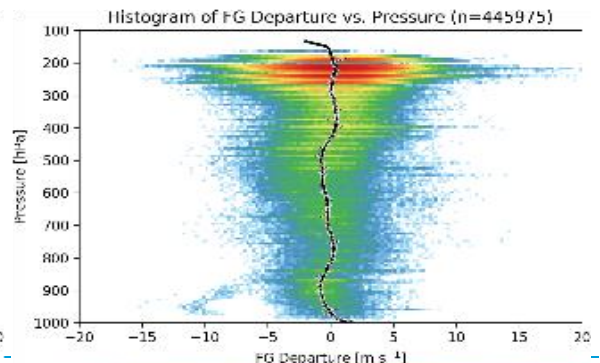
(c) histogram for u, 2017-07-10



(d) histogram for u, 2018-05-02



(e) histogram for v, 2017-07-10

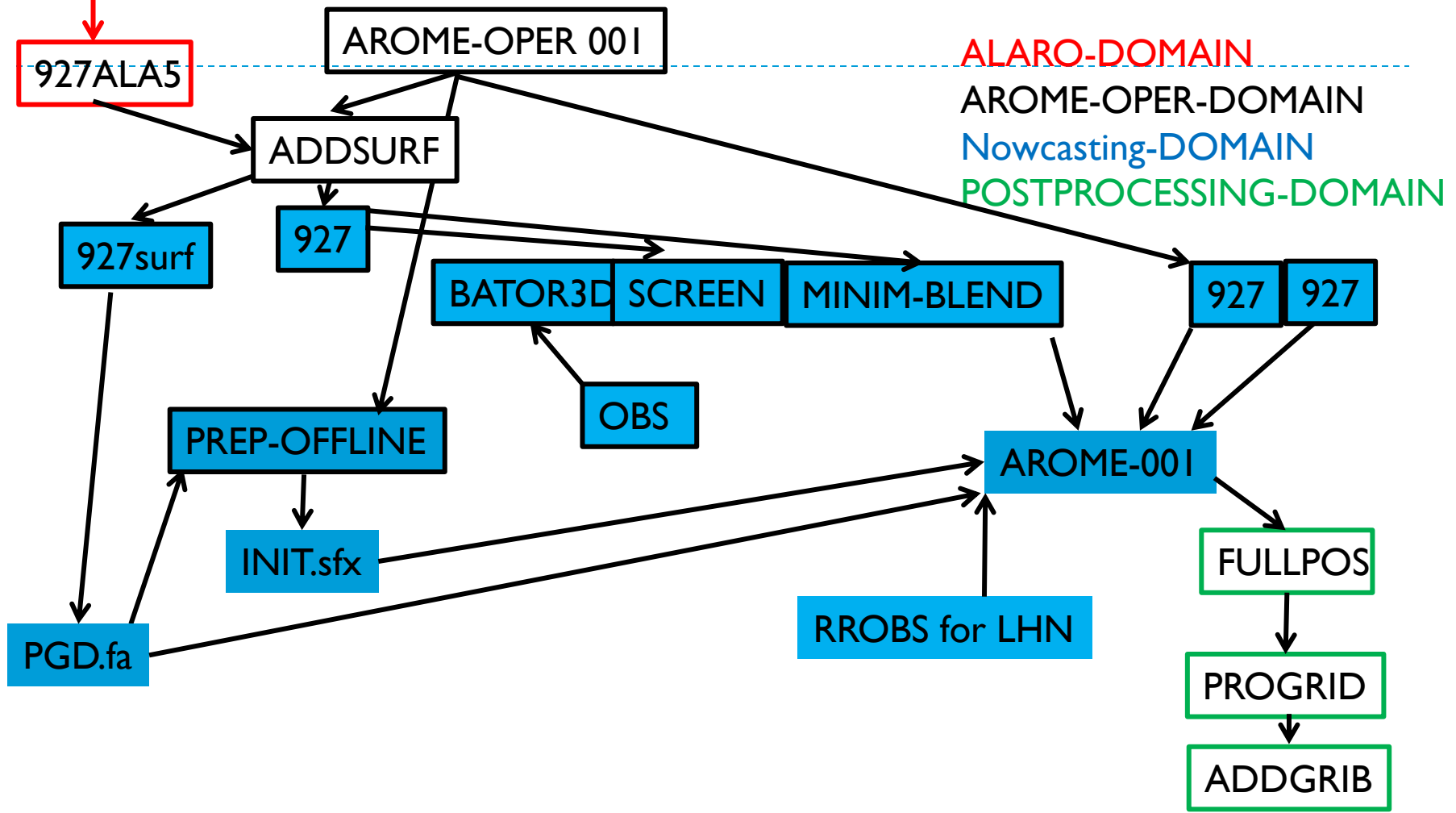


(f) histogram for v, 2018-05-02

ALARO-OPER001

AROME-Nowcasting 1.2km

operation for
entral Europe



ALARO-DOMAIN
 AROME-OPER-DOMAIN
 Nowcasting-DOMAIN
 POSTPROCESSING-DOMAIN