Regional Cooperation for
Limited Area Modeling in Central Europe

LACE
nwp central europe

SHMU – DA releated activity 2014

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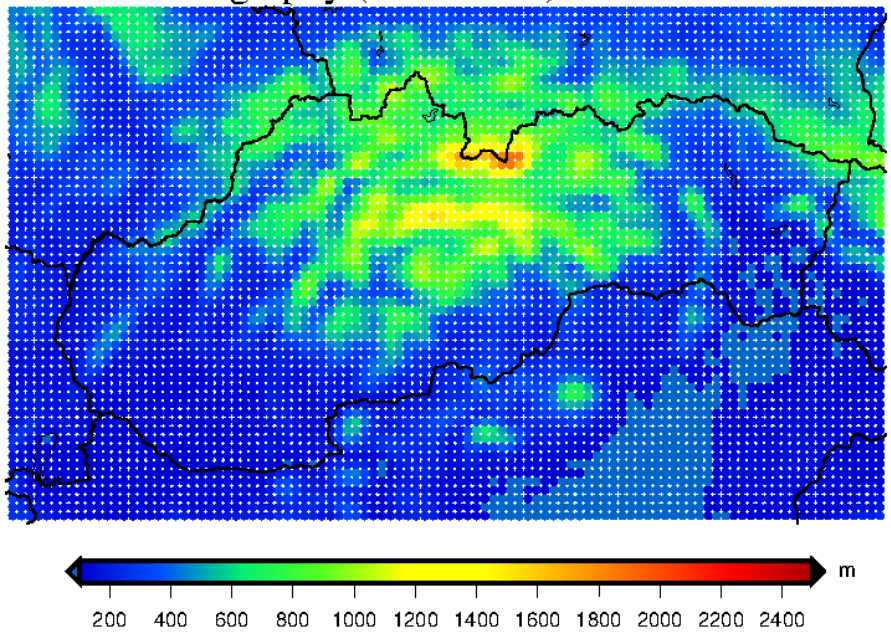
DA activity in SHMU 2014

- Radar assimilation (main work january, february + Budapest)
- HARMONIE (install, tests of 3DVAR, …)
- „New oper suite“

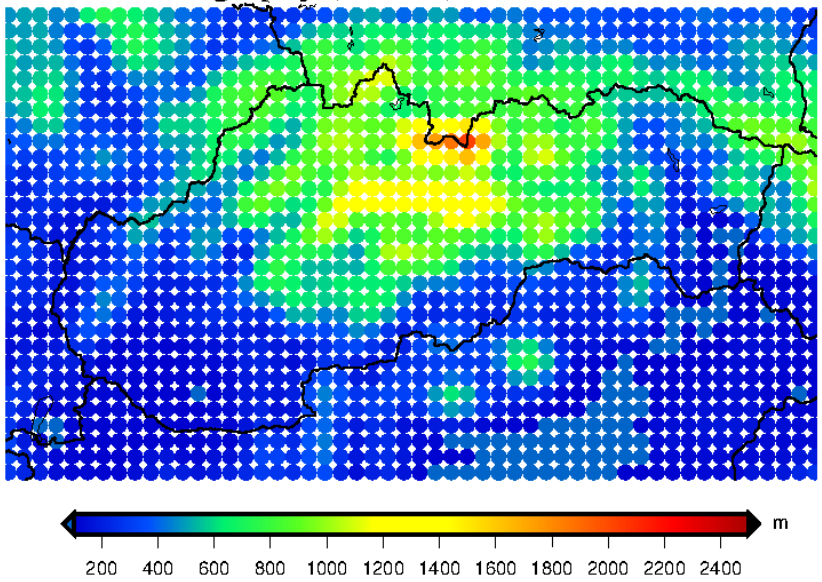
Oper suite		Oper parsuite	
36T1		38T1	
9 km		4.5 km	
37 levels		63 levels	
320x288		625x576	
4 x production 00,06,12,18 UTC	4 – assimilation CANARI BLENDING 00,06,12,18 UTC	2 x production 00,12 UTC	4 x assimilation CANARI BLENDING 00,06,12,18 UTC

„ALARO 9km vs ALARO 4.5km orography“

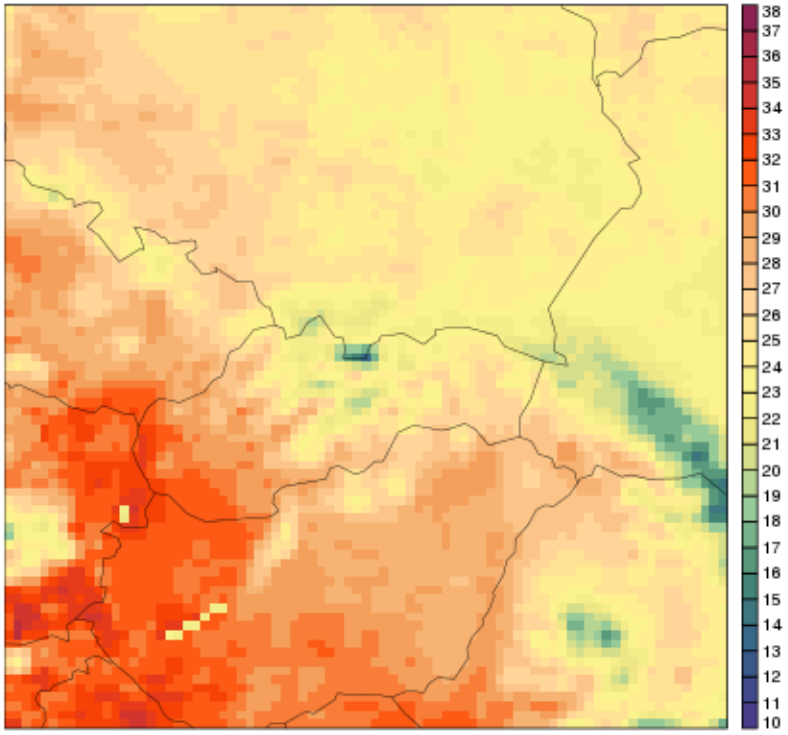
ALADIN orography (4.5x4.5km)

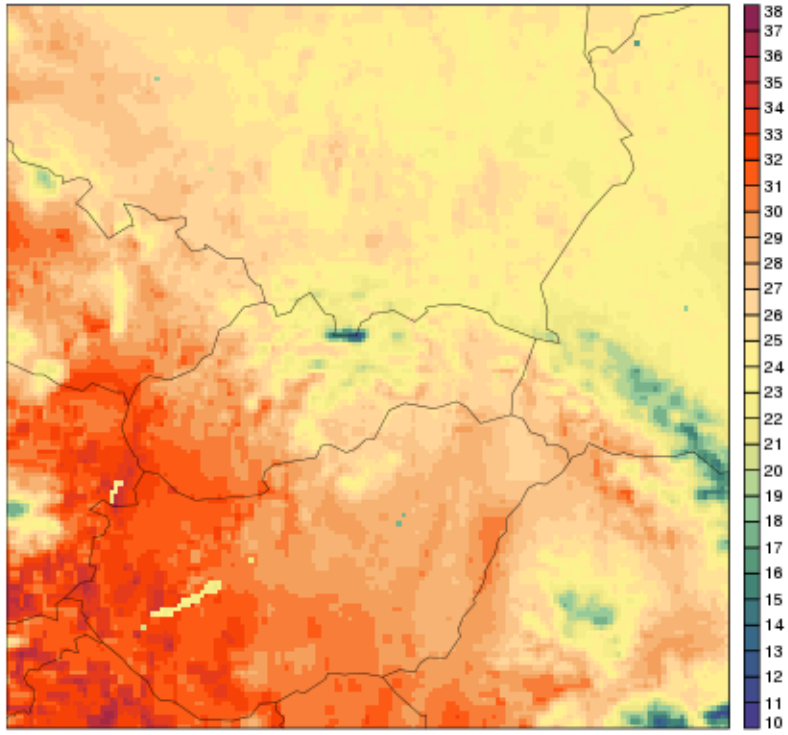


ALADIN orography (9x9km)

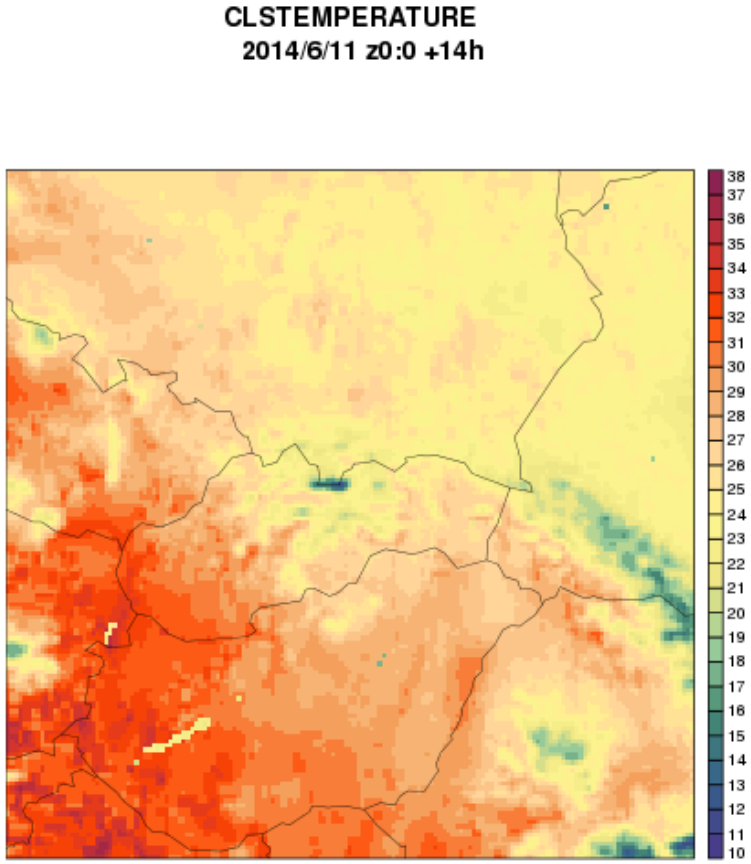


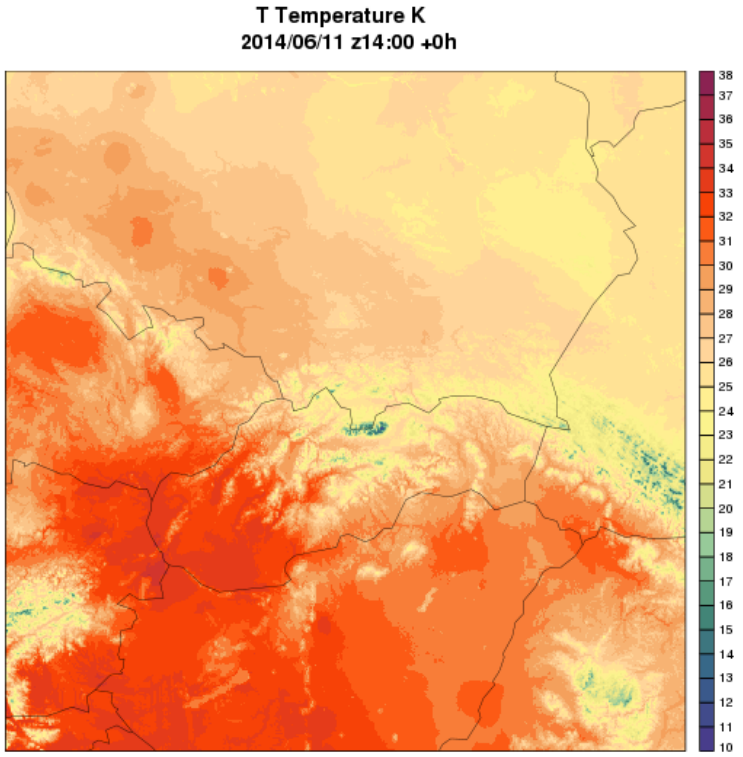
„New oper suite ALARO 9km vs ALARO 4.5km“



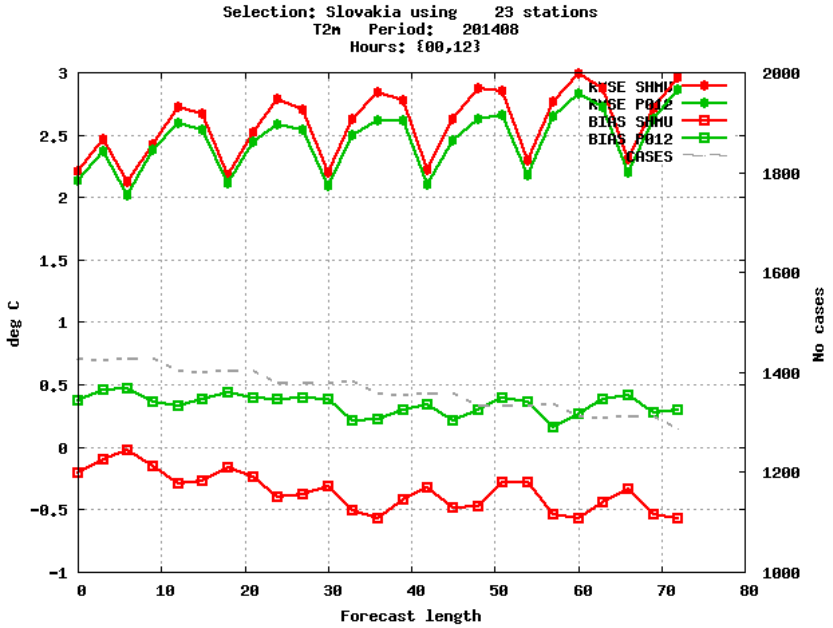


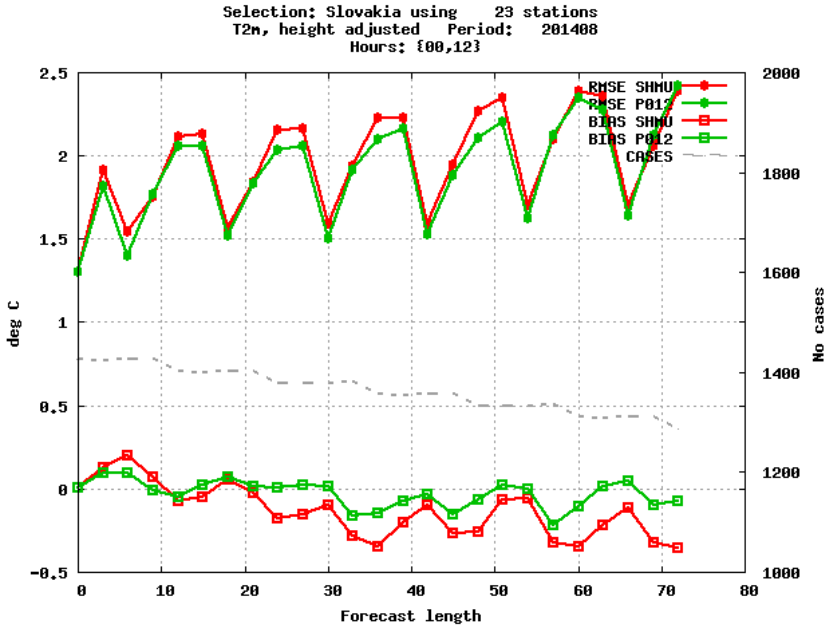
„New oper suite ALARO 4.5km vs INCA“



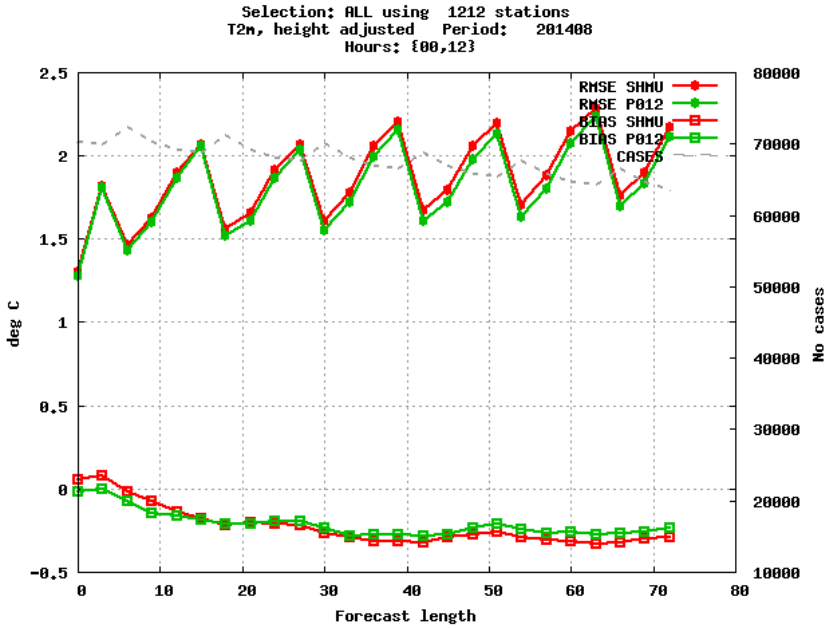


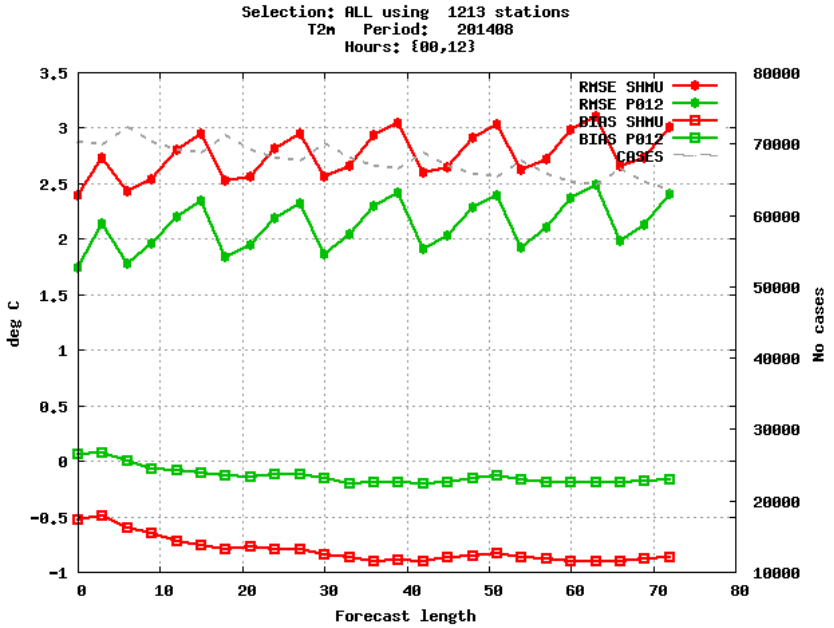
T2m Slovakia – SHMU (9km, 37l) vs P012 (4.5km,63lev)



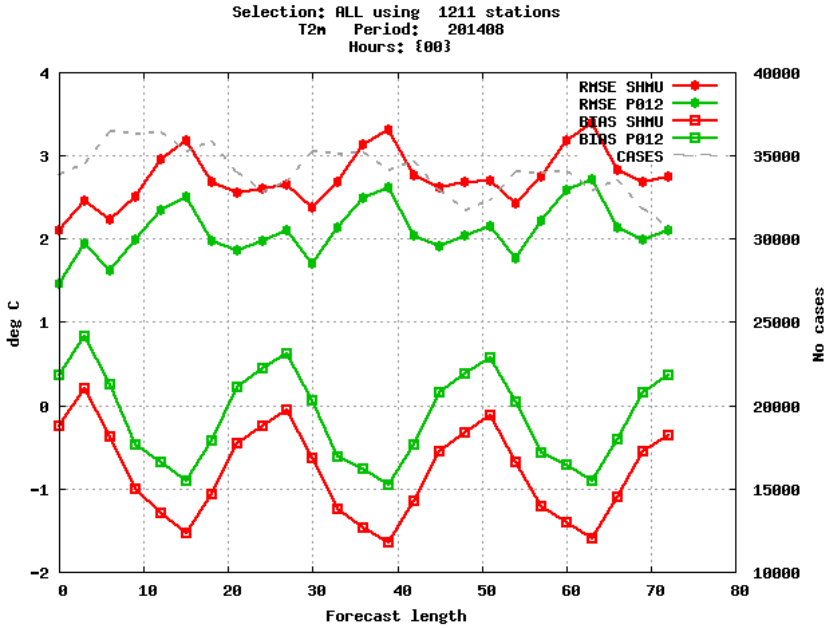


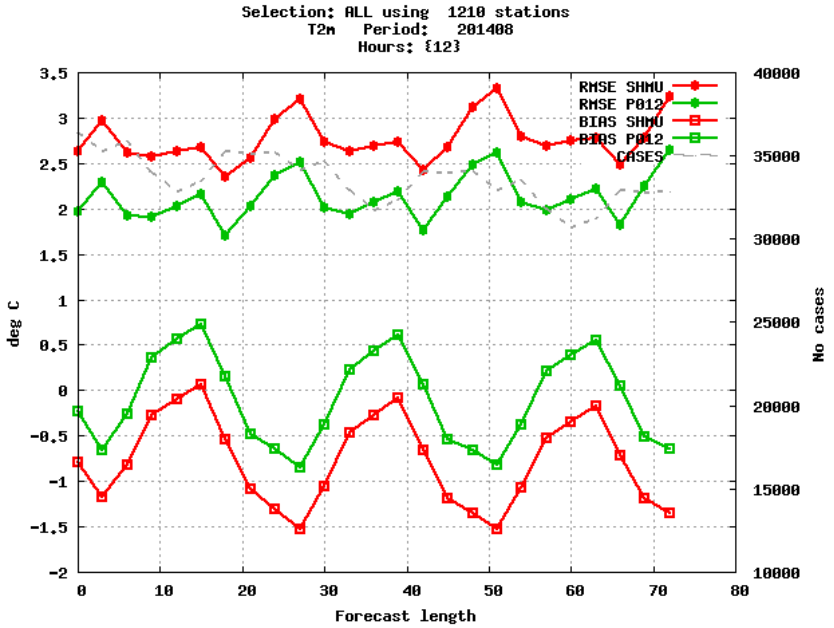
T2m All – SHMU (9km, 37l) vs P012 (4.5km,63lev)





T2m All – SHMU (9km, 37l) vs P012 (4.5km,63lev) 00 vs 12 UTC





Future plans

- ? Switch main operative to “New operparsuite” (ALARO 38T1 4.5km , 4xper day)
- Continue on radar assimilation (AROME 2.5km , ?tests on ALARO 4.5km?)
- More staff on surface assimilation (½ Tarjany - from November 2014)
- HARMONIE on SHMU (3D VAR was also implemented Olda, Mariska thx Roger, Ulf, ….)
  - Technical tests done, but now we must continue
  - HARMONIE working week in Bratislava 2014

- POVAPSYS 2 – project in Slovakia
- warning system for hydrology
- forecast floods, flashfloods ….
  - more than 100 new automatic stations (new
  - 2 new radars expected in 2015

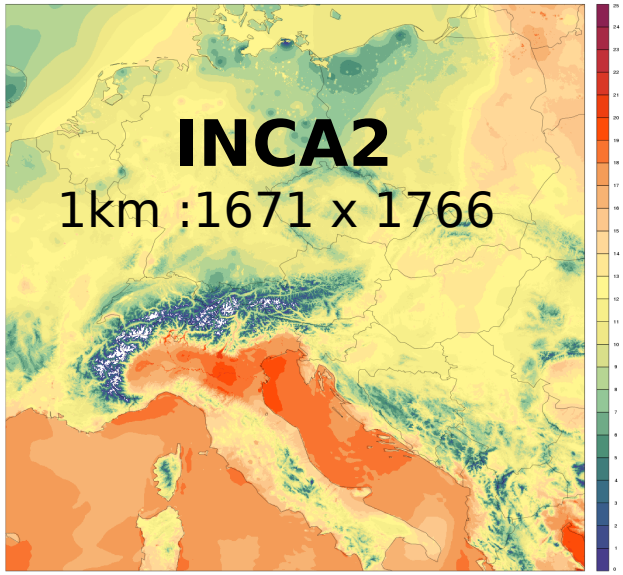
Radar Assimilation

How Radar assimilation works

NWC-SAF
SK - SHMU
HU – OMSZ
Import/nwcs
af

3D VOL RADAR
AT, CZ, ,HR,
HU,RO,SI,SK
import/radar

AWS
AT, CZ, HR, HU
SI,SK
import/station



3D VOL RADAR
AT, CZ, ,HR,
HU,RO,SI,SK
export/radar

INCA2 – how to set up

- **# INPUT data for the analysis #**
- INCA_RR_INPUT_NUM = 4
- INCA_RR_INPUT_NAME_1 = STA_PREC
- INCA_RR_INPUT_NAME_2 = OPERA_RADAR
- INCA_RR_INPUT_NAME_3 = SAFNWC
- INCA_RR_INPUT_NAME_4 = SRTM

INCA2 setting for precipitation station

- **# prec. station parameters #**
- PREC_STATION_DATA_DIR = [inca2_rr_exp path]/import/station
- PREC_STATION_DATA_REPEAT_FREQ_MIN = 5
- PREC_STATION_DEF_QI = 1.0
- PREC_STATION_DEF_STDDEV_MMH = 2.0
- PREC_STATION_QI_TEST_NUM = 1
- PREC_STATION_QI_TEST_NAME_1 = SAFNWC_PC_QI
- PREC_STATION_QI_TEST_NAME_2 = RADAR_QI
- PREC_STATION_SAFNWC_PC_QI_CORR_COEF = 2.0

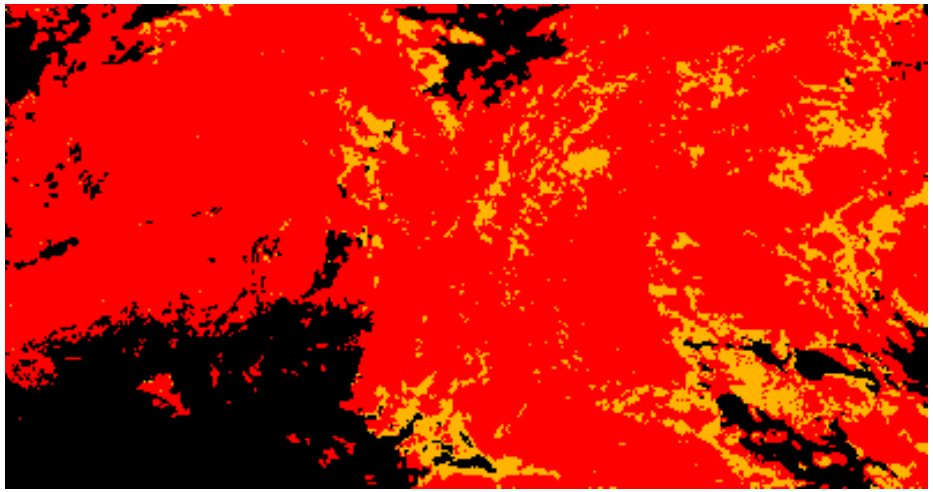
INCA2 setting for radar site

- **# radar parameters #**
- OPERA_RADAR_DATA_DIR = **[**inca2_rr_exp path**]/import/radar**
- OPERA_RADAR_SITE_NUM - number of radars sites
-
- OPERA_RADAR_SITE_CODE_1 = T_PAGZ41_C_LZIB (radar file name)
- OPERA_RADAR_SITE_REPEAT_FREQ_MIN_1 = 5 (measurement frequency of radar site)
- OPERA_RADAR_SITE_DEF_QI_1 = 1.0 (default QI set to 1)
- OPERA_RADAR_SITE_DEF_STDDEV_DBZ_1 = 4.0
- OPERA_RADAR_SITE_CLIM_QI_FILE_1 = = **[inca2_rr_exp path] /import/radar_clim/T_PAGZ41_C_LZIB_CLIM_QI.hdf**
- OPERA_RADAR_SAVE_CORRECTED_1 = 1
- OPERA_RADAR_SAVE_CORRECTED_DIR_1 = **[inca2_rr_exp path]/export/rad_vol**

INCA2 setting for NWCSAF

- SAFNWC_DATA_DIR = [inca2_rr_exp path] /import/safnwc
- SAFNWC_SATELLITE = MSG2
- SAFNWC_REPEAT_FREQ_MIN = 15
- SAFNWC_REGION_NAME = slovakia___p
- SAFNWC_PRODUCT_NUM = 3
- SAFNWC_PRODUCT_NAME_1 = CT
- SAFNWC_PRODUCT_NAME_2 = CTTH_HEIGHT
- SAFNWC_PRODUCT_NAME_3 = PC

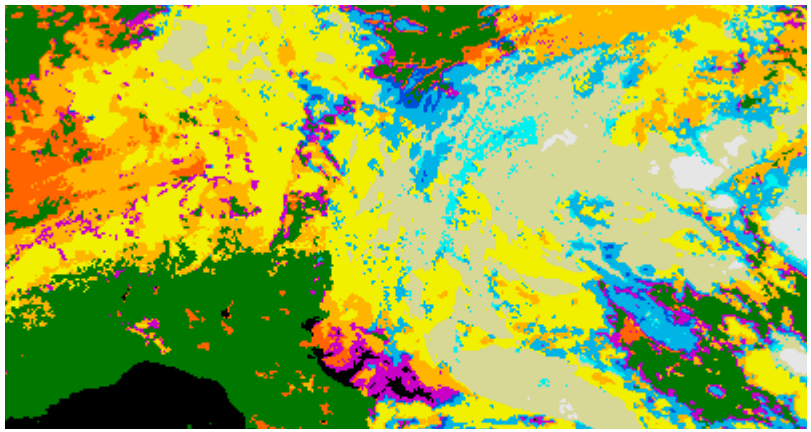
INCA2 - NWCSAF inputs - Cloud Mask

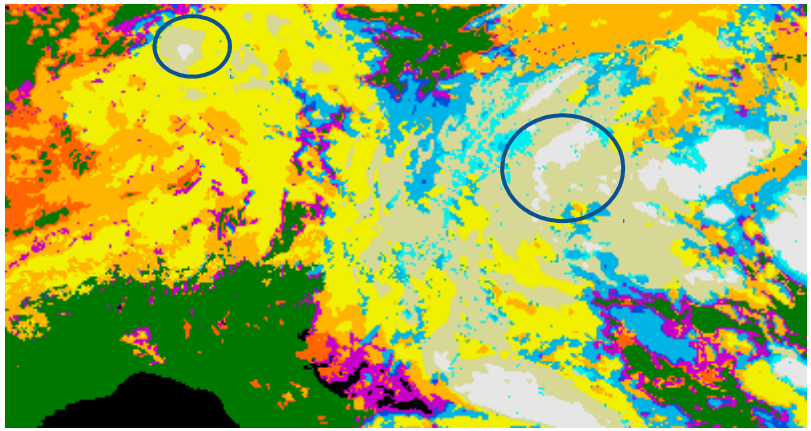


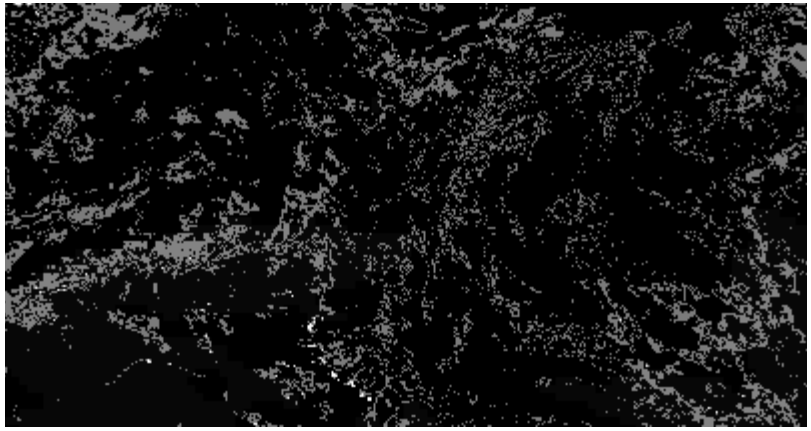
We try to test Nowcasting SAF data from more sources (both institutes receive the same satellite data from is still same but backgroung model is different)

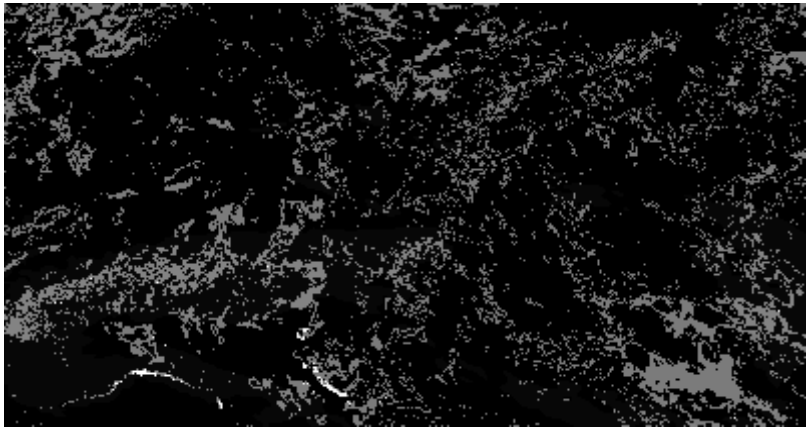
- SHMU (ALARO 9km)
- OMSZ (ECMWF 16km)
- In last phase I try to test and run NWCSAF on SHMU (AROME 2.5km)

Why is import usage local model in NWCSAF



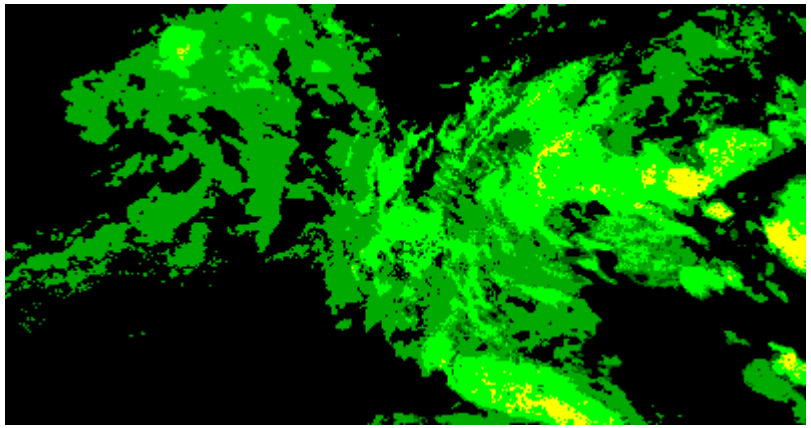






Cloud Type - In left is OMSZ (ECMWF) and in right SHMU (ALARO)
Search for differences

INCA2 - NWCSAF inputs - CRR

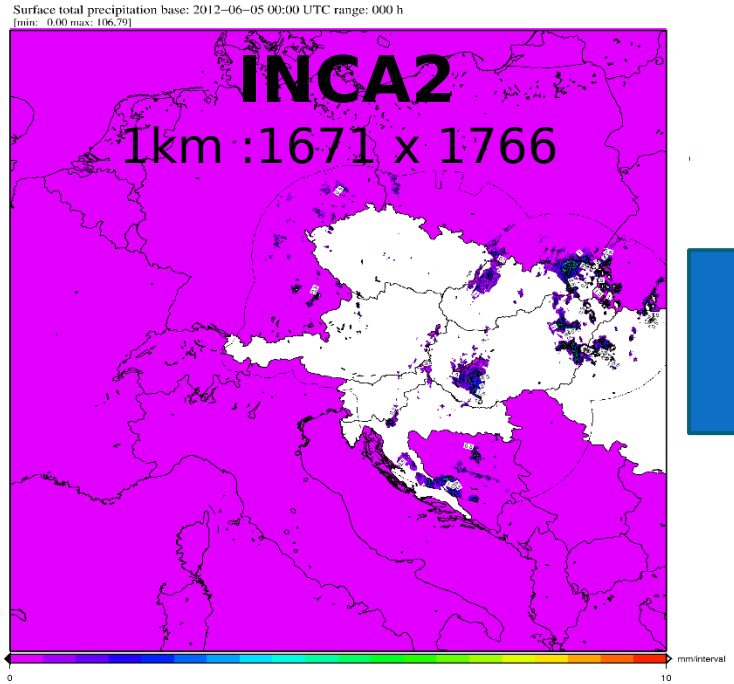


- Nowcasting SAF is now calculated each 15 minutes originally, but we testing for INCA2 5min (MSG - RAPID SCAN)
- Use of local numerical model give you features of RUC (3h) for each product where model input data is used
- Future MTG allow us 2.5 min data
- **But main reason for usage is we use these data for our QC**

INCA2 setting for for QC

- OPERA_RADAR_QI_TEST_NUM = 6
- OPERA_RADAR_QI_TEST_NAME_1 = LAPLACE
- OPERA_RADAR_QI_TEST_NAME_2 = RLAN
- OPERA_RADAR_QI_TEST_NAME_3 = ATTEN
- OPERA_RADAR_QI_TEST_NAME_4 = SAFNWC_CT_CTTH
- OPERA_RADAR_QI_TEST_NAME_5 = BEAM_BLOCK
- OPERA_RADAR_QI_TEST_NAME_6 = CLIM

How Radar assimilation works



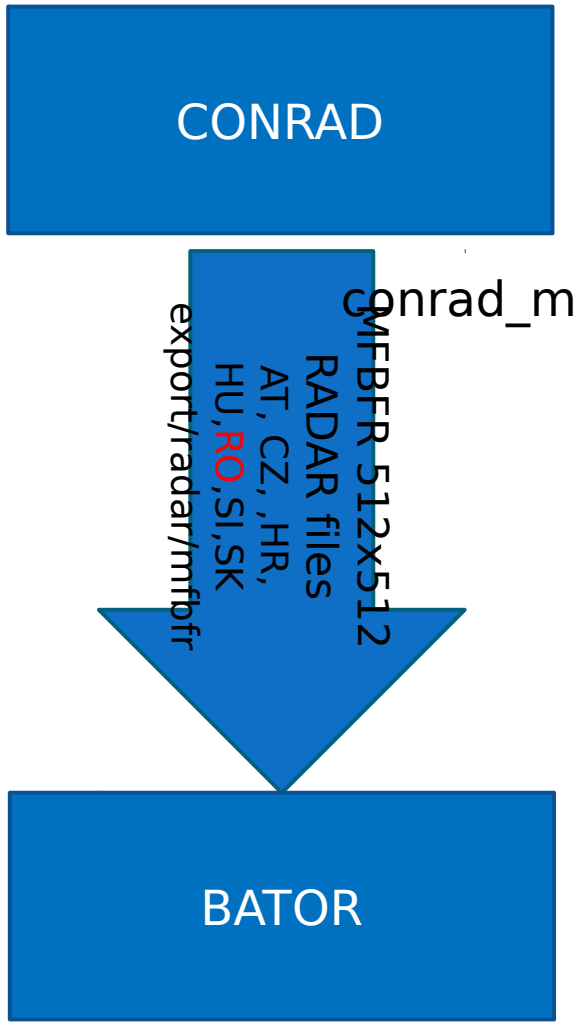
HDF5 3D -RADAR VOL
AT, CZ, ,HR, HU,RO,SI,SK
export/radar

CONRAD

inca2_rr.exe yyyymmdd_HHMMSS [path2config/inca2.conf]

CONRAD

- &userinput
- noelevs=12
- polarcoord=.true.
- radialwind=.false.
- reflectivity=.true.
- wrkdir='[path]'
- legacy_wind=.false.
- country='SK'
- outputformat='MFBUFR'
- bufrfilename='[out.bfr]'
- /



DA plans for 2014

RC-LACE dataset

- Finally evaluate added value of DA (OMSZ – 2.5km) for whole RC-LACE dataset (now is not only radars ,but also AWS)
- **Finally finish work and report from last Budapest stay**

- use HARMONIE for 3DVAR (save me a lot of time in Bratislava)
- Compare usage of ALARO (4.5km) vs ECMWF (16km) vs AROME (2.5km) usage in NWCSAF
- Try to use Bator which direct working with HDF5 files

- We know that on our radar departments (SHMU, OMSZ, ZAMG,???) testing BALTRAD for QC and is possibile to compare a results

Actually used radars for RCLACE radar DA tests

T_PAGZ41_C_LZIB

T_PAGZ51_C_LZIB

T_PAGZ50_C_OKPR

T_PAGZ42_C_SOWR

T_PAGZ44_C_SOWR

T_PAGZ48_C_SOWR

BUD-PPIVol

POG-PPIVol

NAP-PPIVol

T_PAGZ60_C_OKPR

ZIR-PPIVol

RAU-PPIVol

FEL-PPIVol

PAT-PPIVol

T_PAZZ42_C_LDZM

T_PAZZ43_C_LDZM