DATA ASSIMILATION STATUS CROATIA

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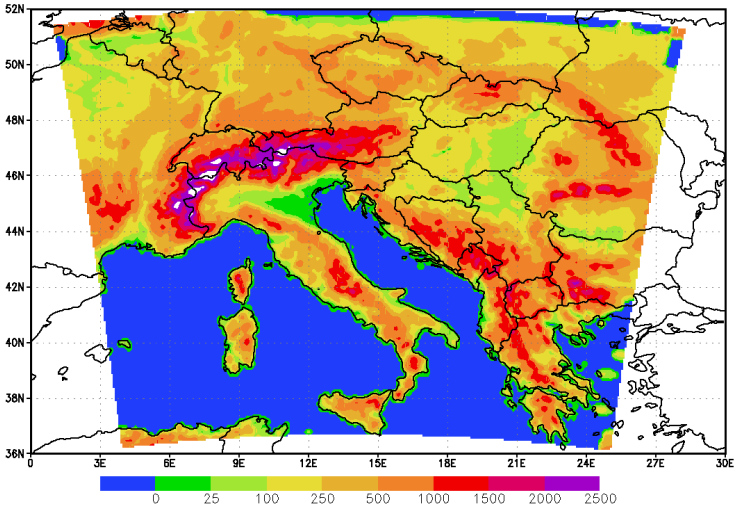
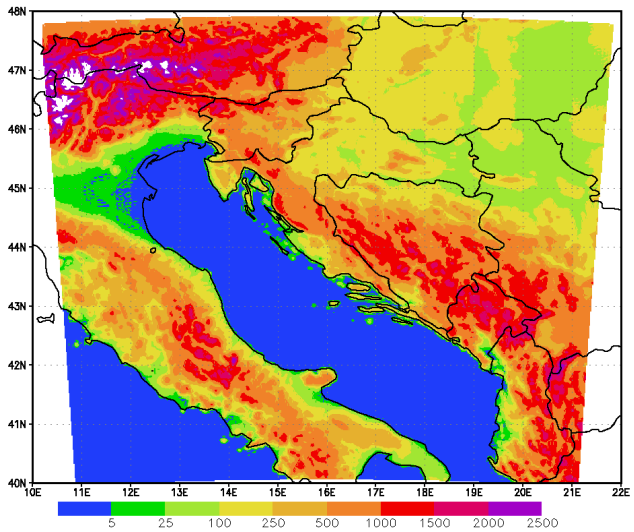
Outline

- Domain & assimilation setup
- New from last WD
- Future plans

Operational setup





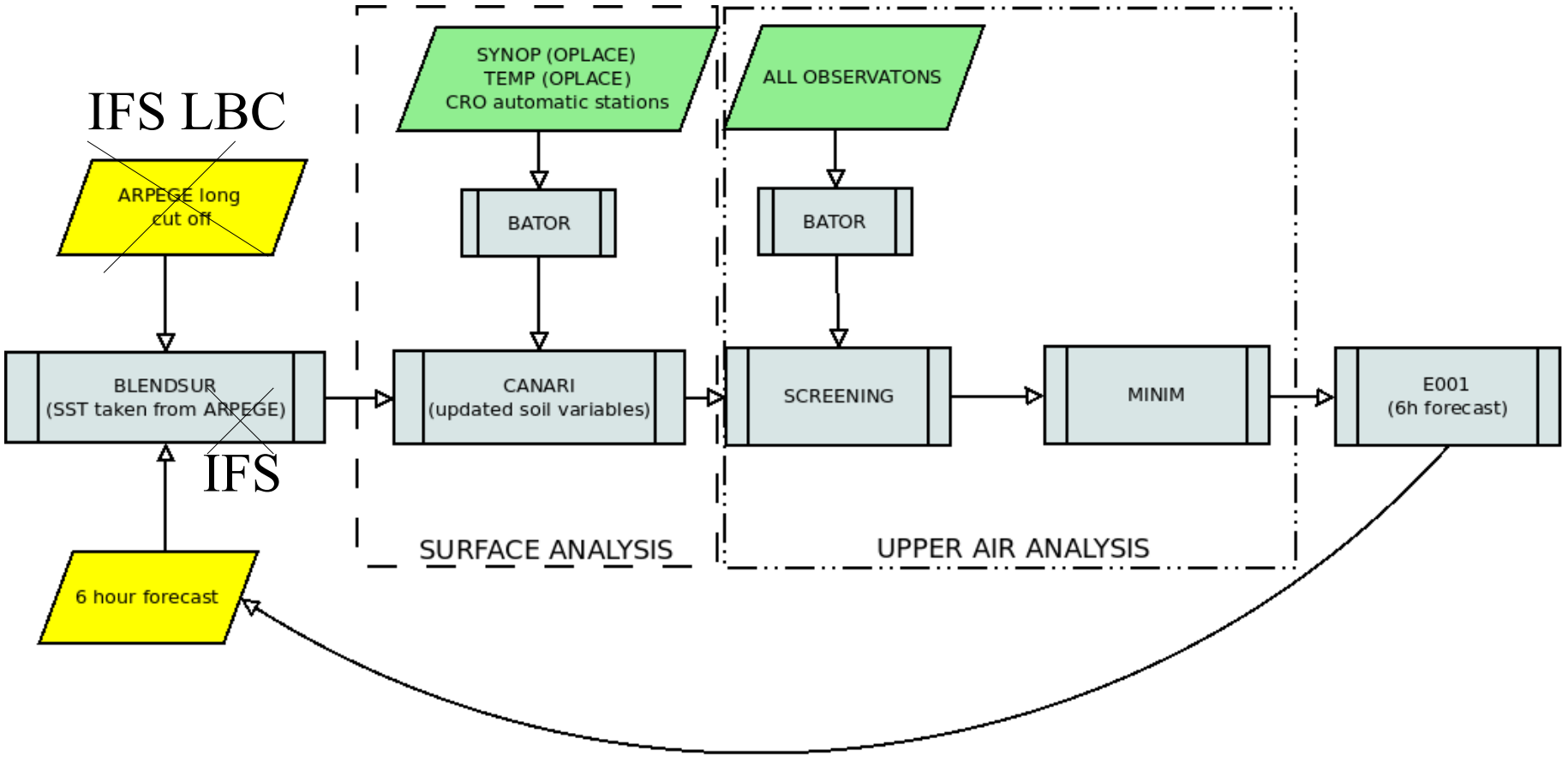
ALADIN HR domain

- 8 km horizontal resolution
- 37 levels, 229x205 (240x216) grid points
- 32T3: ALARO0-3MT, old radiation scheme, DFI
- 72 hours forecast, 1-3 hourly output

ALADIN HR22 domain

- 2 km horizontal resolution: 439x439 (450x450) grid points
- hourly 2 km dynamical adaptation up to 72 hrs @ 15 levels for 10 m wind forecast, model version AL29T2-mxl
- 24 hrs **2 km full NH** model run @ 37 levels, started from 00UTC 6h forecast, model version AL36T1, ALARO0 set-up (operational since July 2011.)

Assimilation setup



- Cy35t1: CANARI, BATOR, screening, minimization; 6hr cycle
- Cy32t3: e001, e927
- OPLACE: SYNOP and automatic stations, TEMP, AMV, AIREP, NOAA16, NOAA18, MSG9/10

Development from last WD

- Coupling to ECMWF – from 01.01.2014. operational
- 4 runs per day (00, 06, 12, 18 UTC), 72hrs forecast
- No progress on radar data assimilation
- CY38t1_bf03 – tests in progress;
  - all data assimilation configurations tested – results comparable with cy35t1

CY38t1_bf03

- Data assimilation cycle (CY38t1_bf03) in “parallel run” started at 01.11.2013.
- New settings:
  - ENSB B matrix instead NMC used in current operational settings
  - NOAA19 amsua/mhs
  - METOP amsua/mhs – passive assimilation (fail(EXPERIMENTAL)) in mf_blacklist)
  - VARBC coldstart option used
  - B matrix tuned over period of 1 month (3 iterations) REDNMC=1.2, QREDNMC=1.4, SIGMAO=0.8 using tuneBG tool

CY38t1_bf03

- VARBC setup and issues
  - Coldstart tested (01.11.2013 – 31.12.2013)
  - Predictor 5 not used (namelist and source code modification)
  - AMSUA (NOAA18 and NOAA19)– problem with geopotential analysis

TEMP

Var	Total	Active	Pass	Reject	Black	O-G Mean	O-A Mean	O-G STD	O-A STD
Report	1105	1105	0	0	0	---	---	---	---
Geo	14451	13620	0	297	537	0.18	1.72	10.67	12.76
T	37283	37027	0	59	197	0.01	0.08	1.35	1.01
U	35110	34891	0	59	162	-0.03	0.01	3.39	2.20
V	35110	34891	0	59	162	-0.07	-0.01	3.47	2.25
Q	35348	23001	0	349	12180	0.03	-0.01	0.71	0.43
RHU	34273	22486	0	177	11648	-4.90	0.00	20.87	0.00

TEMP

Var	Total	Active	Pass	Reject	Black	O-G Mean	O-A Mean	O-G STD	O-A STD
Report	1183	1183	0	0	0	---	---	---	---
Geo	15471	14555	0	351	571	0.21	0.73	10.70	11.09
T	39888	39623	0	62	203	0.01	0.08	1.35	1.06
U	37634	37416	0	50	174	-0.03	0.00	3.37	2.38
V	37634	37416	0	50	174	-0.06	-0.01	3.47	2.42
Q	37782	24586	0	351	13046	0.02	-0.00	0.69	0.47
RHU	36634	24012	0	183	12481	-5.37	0.00	20.54	0.00

CY38t1_bf03

NOAA-19 AMSU-A

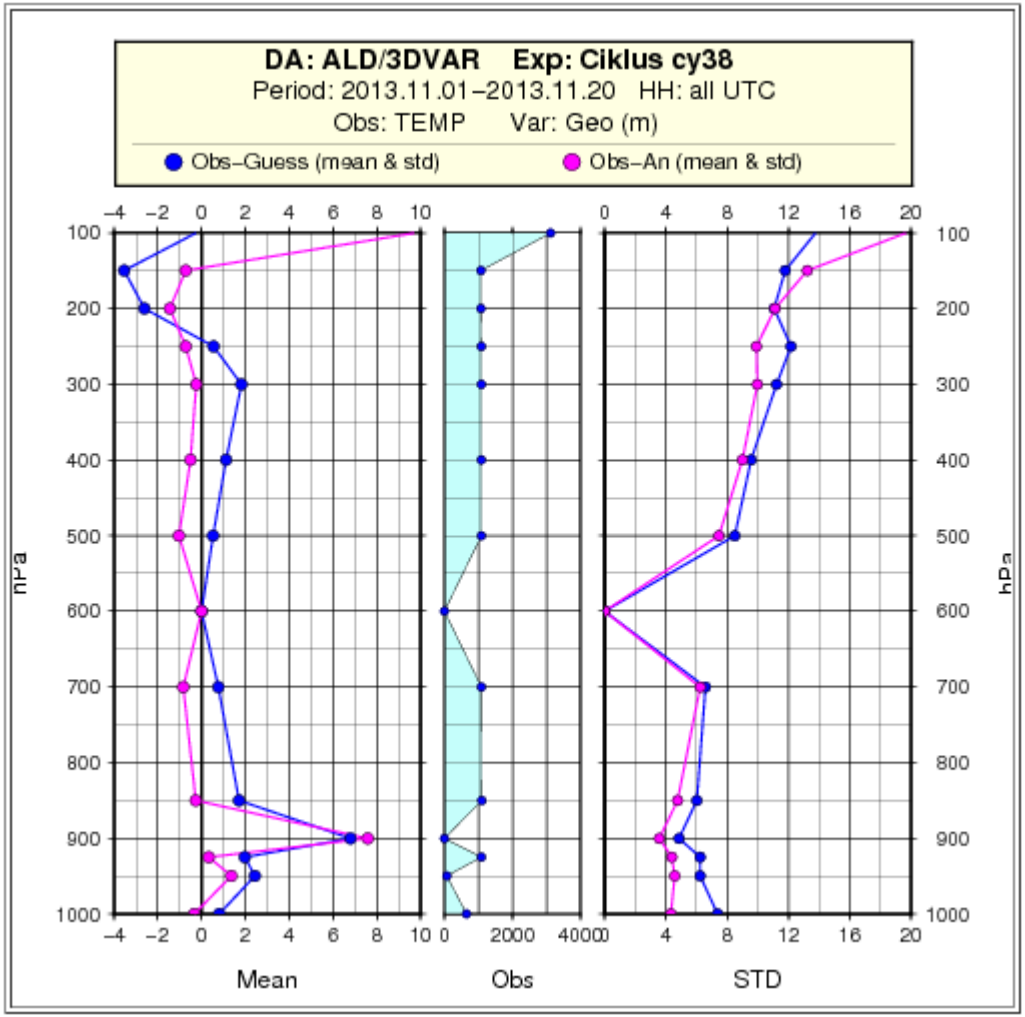
Channel	Total	Active	Pass	Reject	Black	O-G Mean	O-A Mean	O-G STD	O-A STD
1	34920	0	0	12179	34920	0.00	0.00	0.00	0.00
2	34920	0	0	12192	34920	0.00	0.00	0.00	0.00
3	34897	0	0	12074	34897	0.00	0.00	0.00	0.00
4	34897	0	0	2120	34897	0.00	0.00	0.00	0.00
5	34897	1168	0	13152	32998	-0.51	-0.04	0.26	0.10
6	34897	1469	0	4999	32509	-0.46	-0.17	0.22	0.20
7	34588	1583	0	813	32192	-0.45	-0.29	0.33	0.34
8	34897	9610	0	18548	6739	0.22	0.16	0.72	0.51
9	34897	9610	0	18548	6739	-0.19	-0.01	0.28	0.19
10	34897	9610	0	18548	6739	-0.26	0.08	0.41	0.23
11	34897	9610	0	18548	6739	-0.09	-0.10	0.81	0.25
12	34897	9610	0	18548	6739	1.39	0.24	1.00	0.34
13	34897	9153	28158	22297	6739	4.53	4.17	2.34	2.29
14	34897	0	0	34897	34897	0.00	0.00	0.00	0.00
15	34897	0	0	12151	34897	0.00	0.00	0.00	0.00

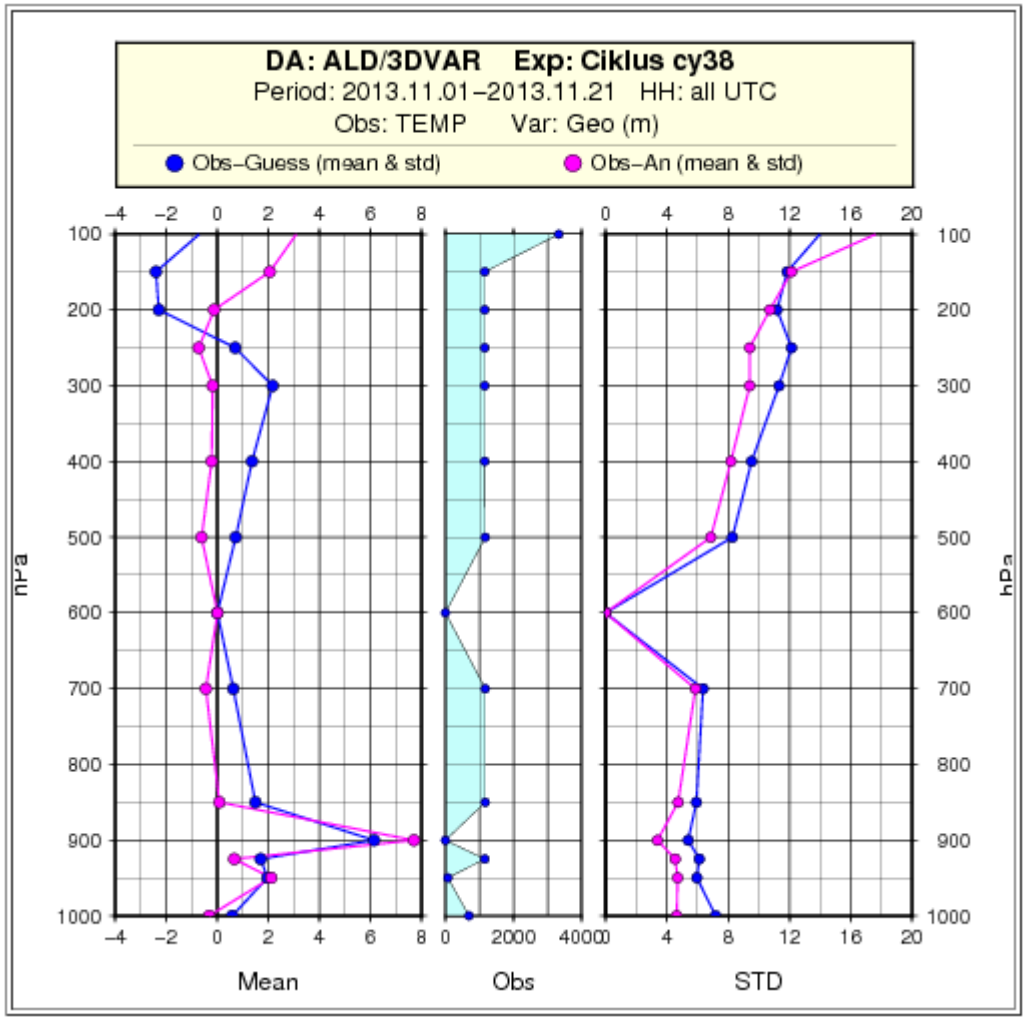
NOAA-19 AMSU-A

Channel	Total	Active	Pass	Reject	Black	O-G Mean	O-A Mean	O-G STD	O-A STD
1	38075	0	0	13423	38075	0.00	0.00	0.00	0.00
2	38075	0	0	13437	38075	0.00	0.00	0.00	0.00
3	38049	0	0	13315	38049	0.00	0.00	0.00	0.00
4	38049	0	0	2378	38049	0.00	0.00	0.00	0.00
5	38049	1238	0	14521	36025	-0.49	-0.08	0.26	0.10
6	38049	1528	0	5396	35551	-0.44	-0.23	0.22	0.19
7	37740	10340	30542	20202	7198	-0.24	-0.22	0.39	0.38
8	38049	10420	30783	20363	7266	0.20	0.19	0.72	0.70
9	38049	10420	30783	20363	7266	-0.11	-0.11	0.30	0.29
10	38049	10420	0	20363	7266	-0.21	0.07	0.43	0.20
11	38049	10420	0	20363	7266	0.00	-0.06	0.78	0.25
12	38049	10420	0	20363	7266	1.80	-0.07	1.01	0.59
13	38049	9716	22548	24737	7266	5.07	3.42	2.43	2.29
14	38049	0	0	38049	38049	0.00	0.00	0.00	0.00
15	38049	0	0	13399	38049	0.00	0.00	0.00	0.00

Ch 7,8,9,13 - PASSIVE

CY38t1_bf03


DA: ALD/3DVAR Exp: Ciklus cy38
Period: 2013.11.01–2013.11.20 HH: all UTC
Obs: TEMP Var: Geo (m)
Obs–Guess (mean & std)
Obs–An (mean & std)
hPa
Mean
Obs
STD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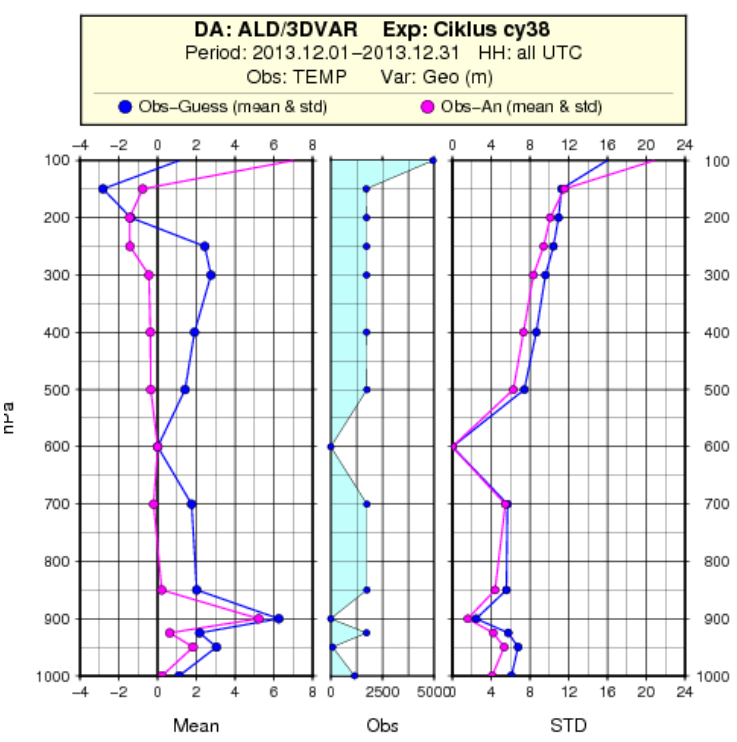
Period: 2013.11.01–2013.11.21 HH: all UTC
Obs: TEMP Var: Geo (m)
Obs–Guess (mean & std)
Obs–An (mean & std)
hPa
Mean
Obs
STD

CY38t1_bf03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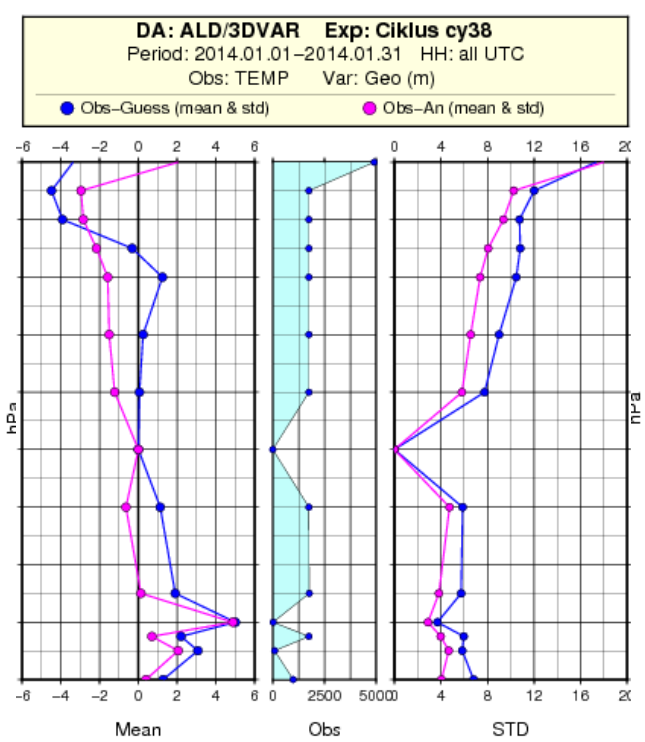
Period: 2013.12.01–2013.12.31 HH: all UTC
Obs: TEMP Var: Geo (m)
Obs–Guess (mean & std)
Obs–An (mean & std)
hPa
Mean
Obs
STD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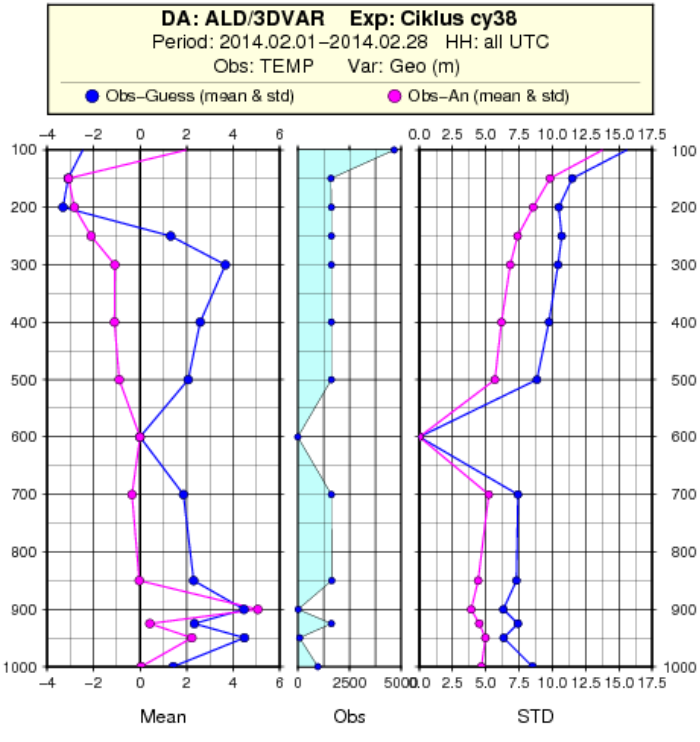
Period: 2014.01.01–2014.01.31 HH: all UTC
Obs: TEMP Var: Geo (m)
Obs–Guess (mean & std)
Obs–An (mean & std)
hPa
Mean
Obs
STD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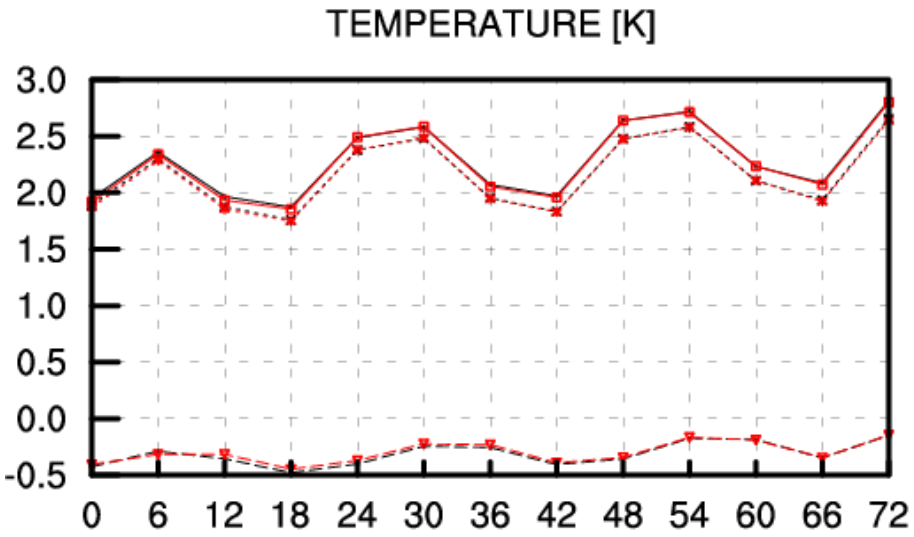
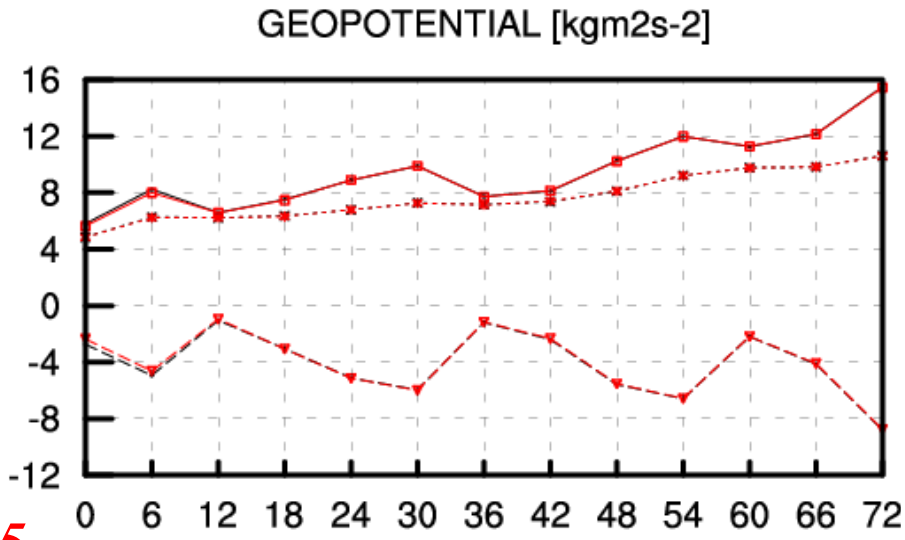
Period: 2014.02.01–2014.02.28 HH: all UTC
Obs: TEMP Var: Geo (m)
Obs–Guess (mean & std)
Obs–An (mean & std)
Mean
Obs
STD

CY38t1_bf03

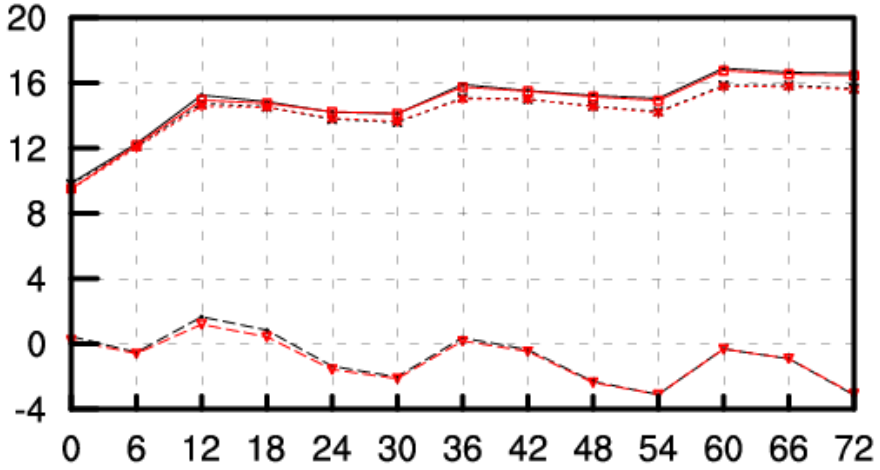
Scores for March 2014 vs. SYNOP and TEMP

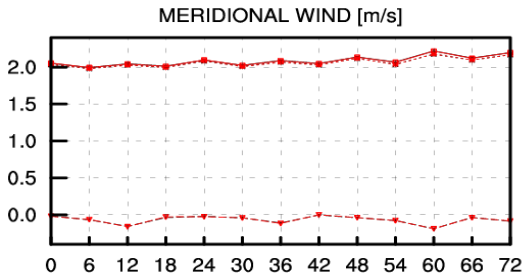


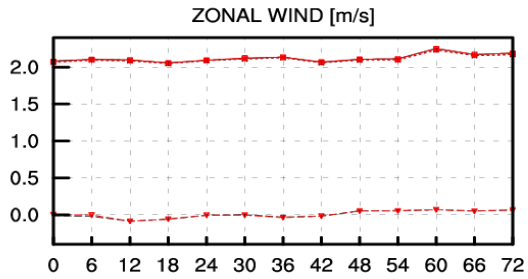


CY35

CY38







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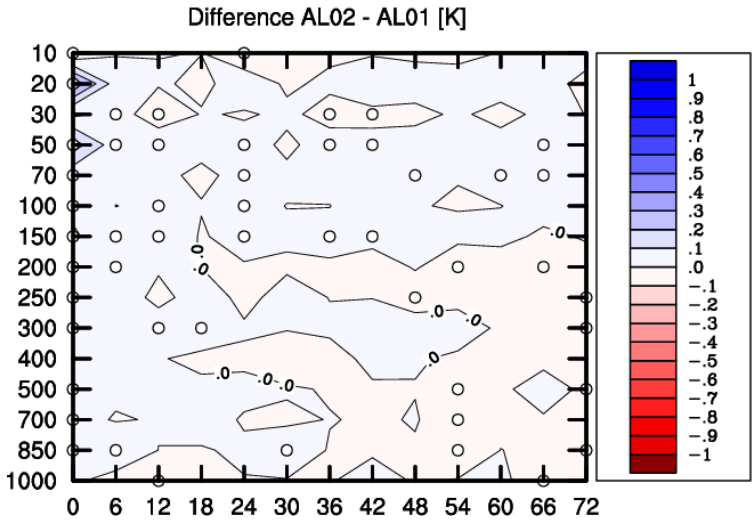
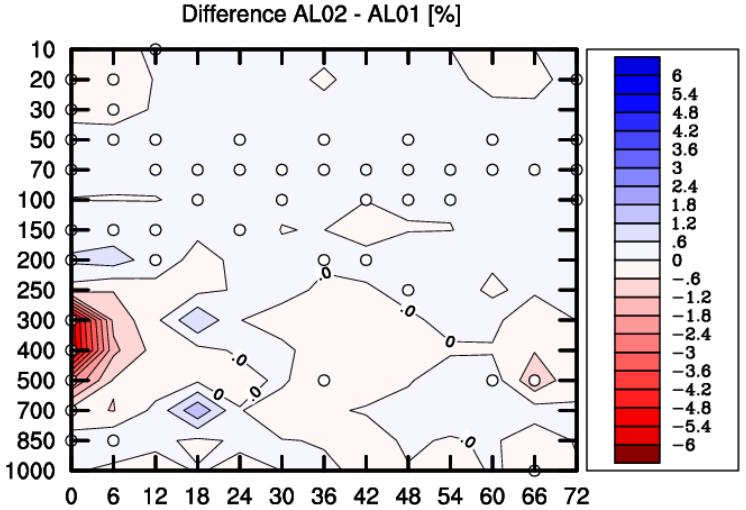
CY38t1_bf03

RMSE for March 2014 vs. TEMP

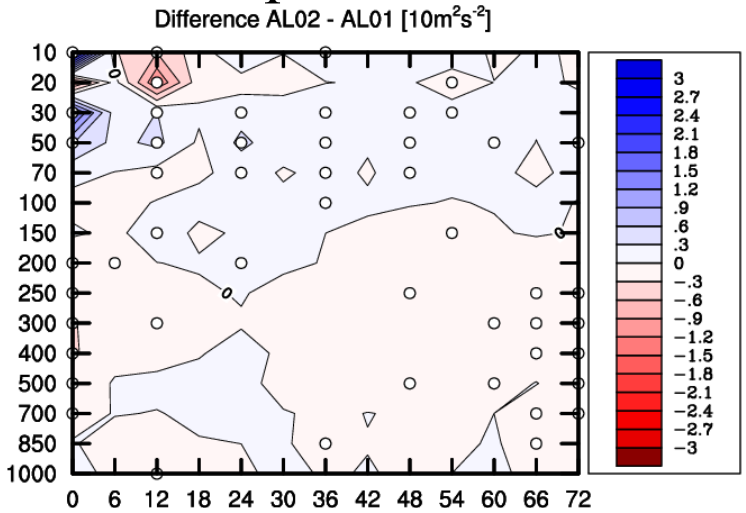
Temperature



Relative Humidity



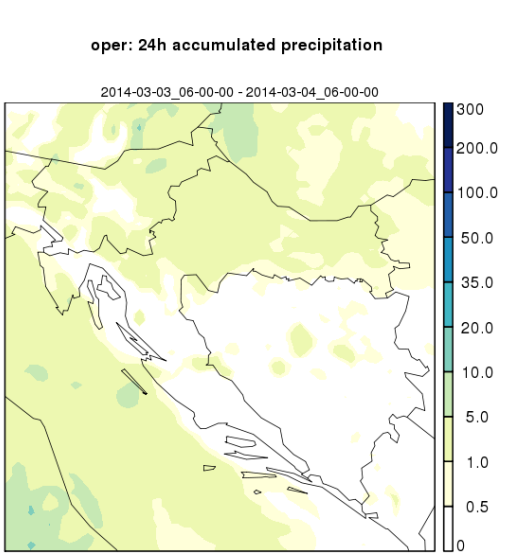
Geopotential

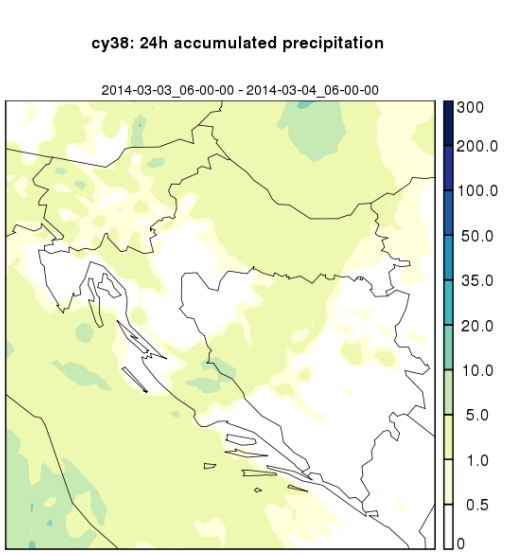


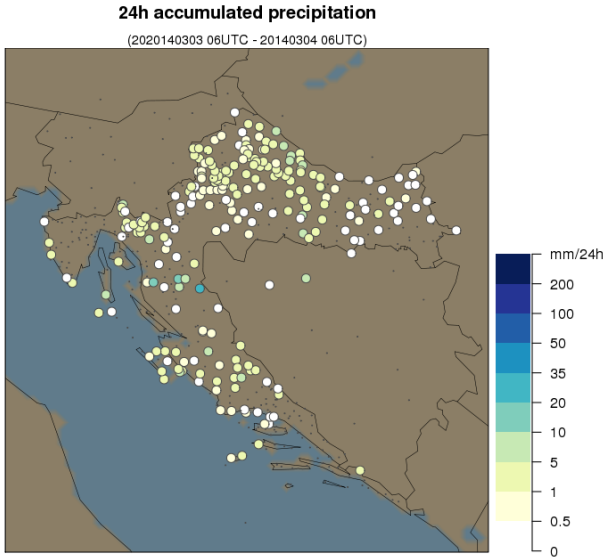
CY35 better

CY38 better

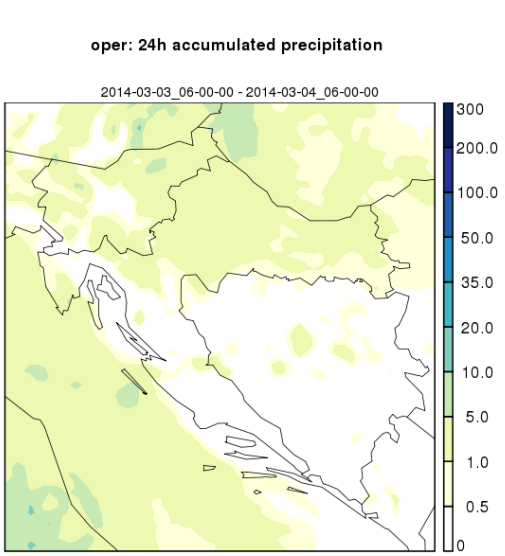
CASE 1

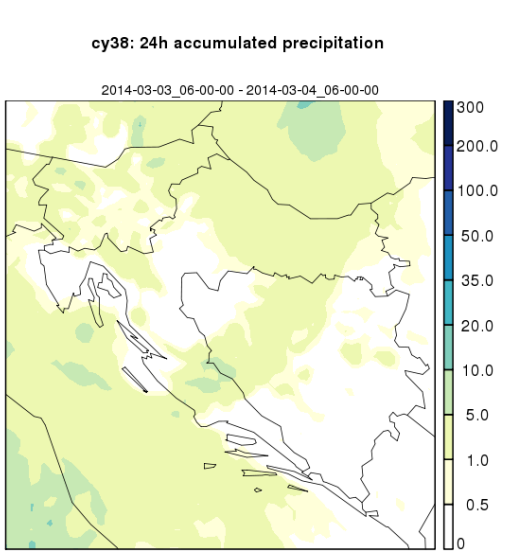

oper: 24h accumulated precipitation
2014-03-03_06-00-00 - 2014-03-04_06-00-00
300
200.0
100.0
50.0
35.0
20.0
10.0
5.0
1.0
0.5
0

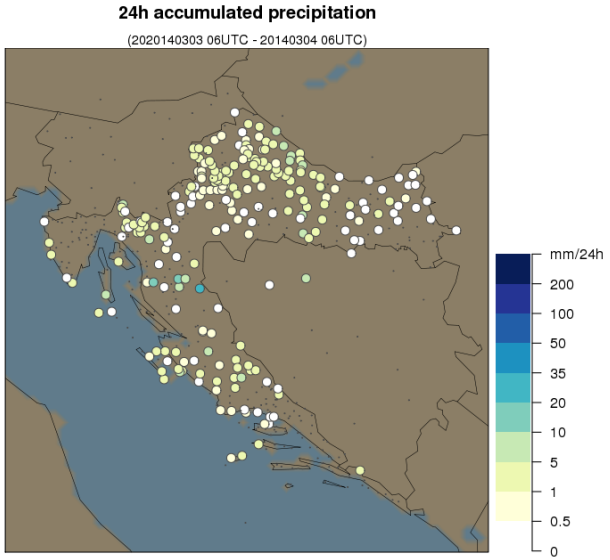

cy38: 24h accumulated precipitation
2014-03-03_06-00-00 - 2014-03-04_06-00-00
300
200.0
100.0
50.0
35.0
20.0
10.0
5.0
1.0
0.5
0


24h accumulated precipitation
(2020140303 06UTC - 20140304 06UTC)
mm/24h
200
100
50
35
20
10
5
1
0.5
0

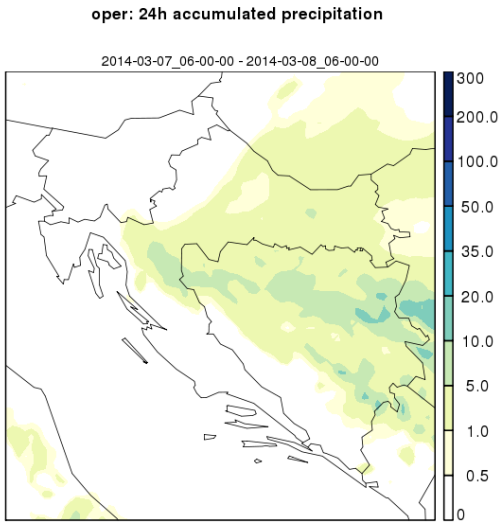
CASE 1

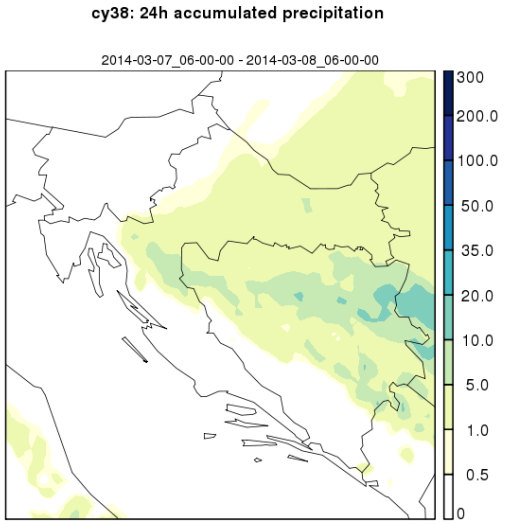

oper: 24h accumulated precipitation
2014-03-03_06-00-00 - 2014-03-04_06-00-00
300
200.0
100.0
50.0
35.0
20.0
10.0
5.0
1.0
0.5
0

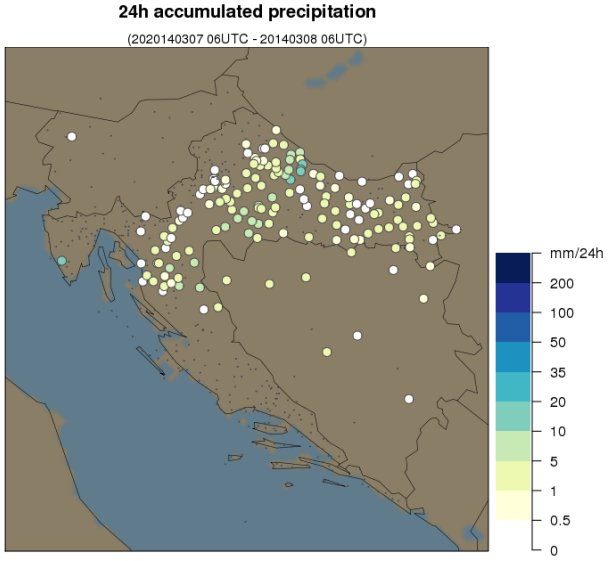

cy38: 24h accumulated precipitation
2014-03-03_06-00-00 - 2014-03-04_06-00-00
300
200.0
100.0
50.0
35.0
20.0
10.0
5.0
1.0
0.5
0


24h accumulated precipitation
(2020140303 06UTC - 20140304 06UTC)
mm/24h
200
100
50
35
20
10
5
1
0.5
0

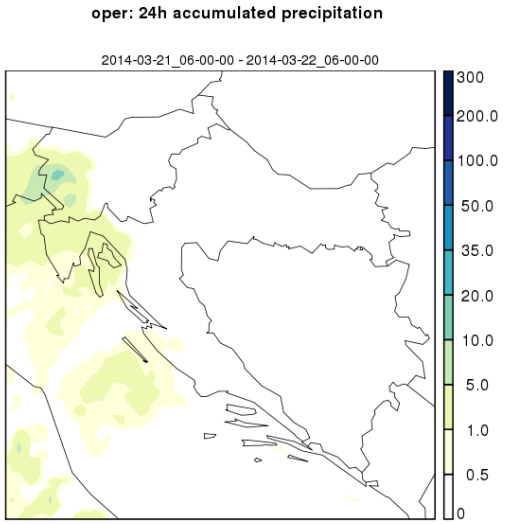
CASE 2


oper: 24h accumulated precipitation
2014-03-07_06-00-00 - 2014-03-08_06-00-00
300
200.0
100.0
50.0
35.0
20.0
10.0
5.0
1.0
0.5
0


cy38: 24h accumulated precipitation
2014-03-07_06-00-00 - 2014-03-08_06-00-00
300
200.0
100.0
50.0
35.0
20.0
10.0
5.0
1.0
0.5
0


24h accumulated precipitation
(2020140307 06UTC - 20140308 06UTC)
mm/24h
200
100
50
35
20
10
5
1
0.5
0

CASE 3


oper: 24h accumulated precipitation
2014-03-21_06-00-00 - 2014-03-22_06-00-00
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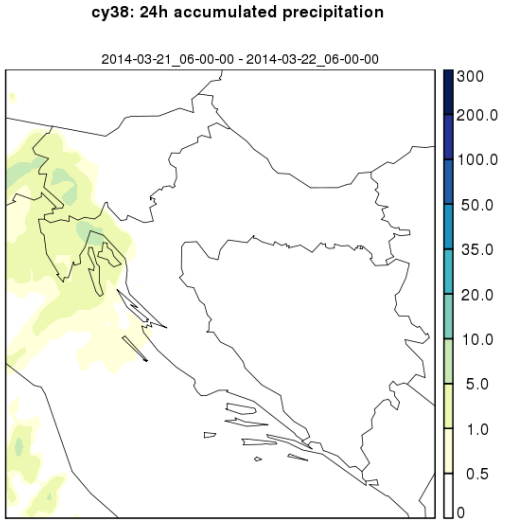
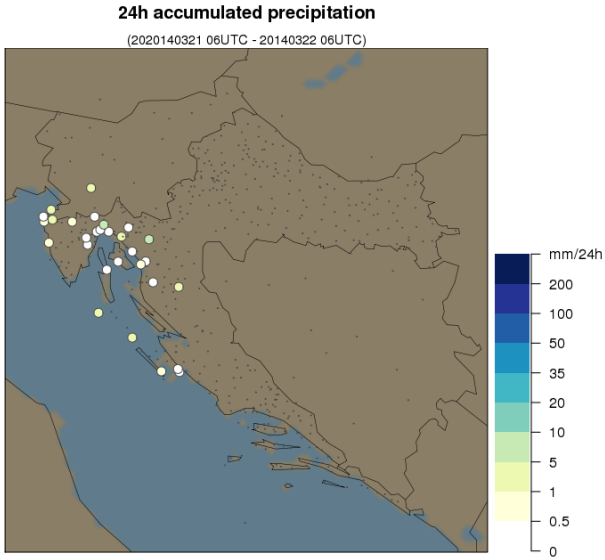
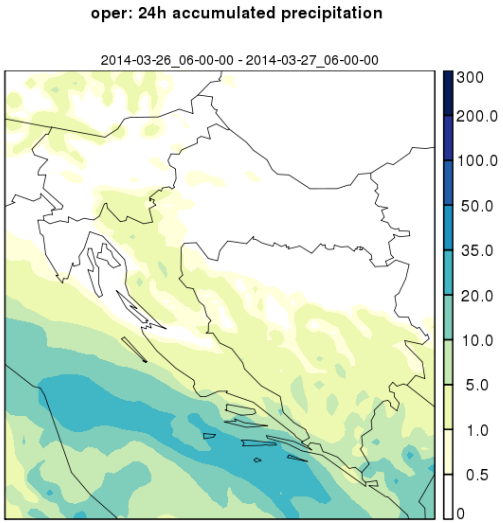
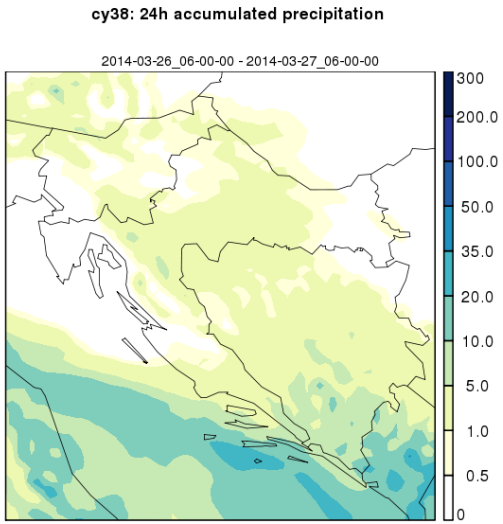
200.0
100.0
50.0
35.0
20.0
10.0
5.0
1.0
0.5
0

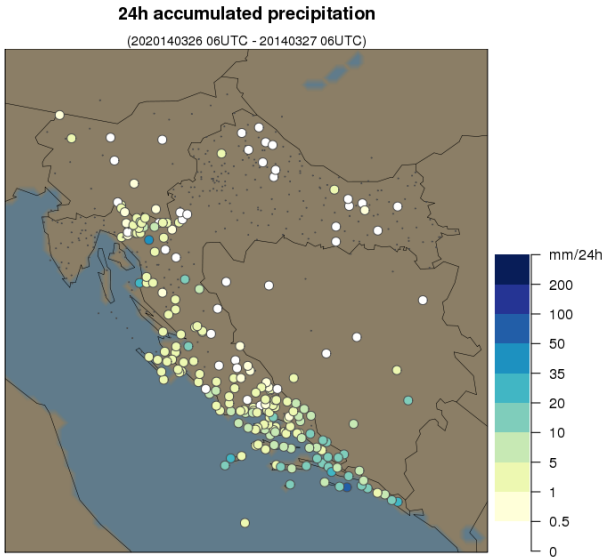

cy38: 24h accumulated precipitation
2014-03-21_06-00-00 - 2014-03-22_06-00-00
300
200.0
100.0
50.0
35.0
20.0
10.0
5.0
1.0
0.5
0


24h accumulated precipitation
(2020140321 06UTC - 20140322 06UTC)
mm/24h
200
100
50
35
20
10
5
1
0.5
0

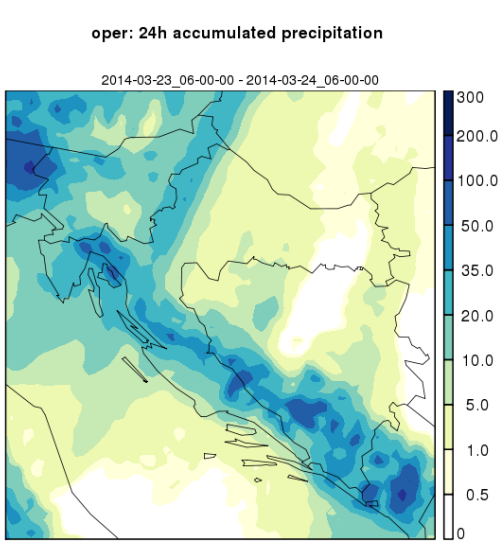
CASE 4

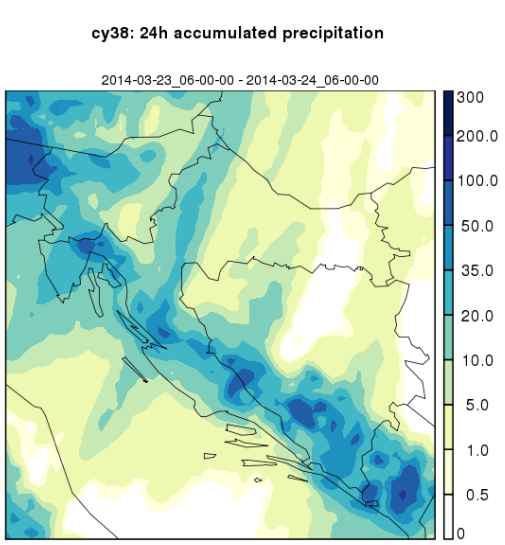

oper: 24h accumulated precipitation
2014-03-26_06-00-00 - 2014-03-27_06-00-00
300
200.0
100.0
50.0
35.0
20.0
10.0
5.0
1.0
0.5
0

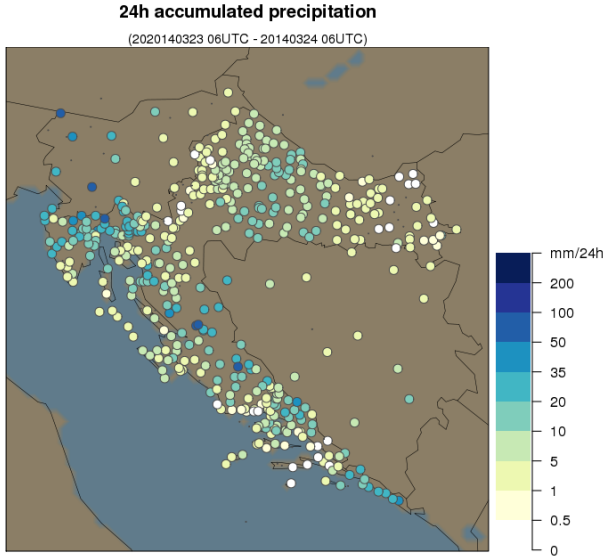

cy38: 24h accumulated precipitation
2014-03-26_06-00-00 - 2014-03-27_06-00-00
300
200.0
100.0
50.0
35.0
20.0
10.0
5.0
1.0
0.5
0


24h accumulated precipitation
(2020140326 06UTC - 20140327 06UTC)
mm/24h
200
100
50
35
20
10
5
1
0.5
0

CASE 5


oper: 24h accumulated precipitation
2014-03-23_06-00-00 - 2014-03-24_06-00-00
300
200.0
100.0
50.0
35.0
20.0
10.0
5.0
1.0
0.5
0


cy38: 24h accumulated precipitation
2014-03-23_06-00-00 - 2014-03-24_06-00-00
300
200.0
100.0
50.0
35.0
20.0
10.0
5.0
1.0
0.5
0


24h accumulated precipitation
(2020140323 06UTC - 20140324 06UTC)
mm/24h
200
100
50
35
20
10
5
1
0.5
0

Future plans

- Continue tests with cy38 and new settings
- Compute ENSB matrix from IFS ensemble
- Compute B matrix for ALARO 4km domain; tune B matrix
- Test 3hr cycling
- Test Mescan correlation function within CANARI
- Continue work on radar data assimilation