

Summary report on DAsKIT video-conference, 23 June 2020

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The main topics of this video-conference were:

1. Recent news on the DAsKIT countries
2. Status, progress on actions (local implementation, validation and diagnostics of surfDA at CY43T2) and actual issues
3. Planning of "2020 Joint LACE Data Assimilation & DAsKIT Working Days", Vienna
4. Planning of next actions & AOB

Short status per country:

ALGERIA

data acquisition:

SYNOP (3-hour GTS; 1-hour GTS automatic stations), TEMP (5 stations/day), AMDAR (1-hour GTS BUFR) and ASCAT (MetopA, MetopB/1-hour GTS BUFR).

data pre-processing:

SYNOP (conversion to BUFR; duplications and amends are tackled); TEMP (filtered over ALADIN domain); AMDAR (filtered over ALADIN domain; selection of template 311010); ASCAT (filtered over ALADIN domain).

Plans: pre-processing of GPS data.

monitoring tools:

OBSMON installation is on-going; MANDALAY (CY40T1).

verification tools:

HARP not installed.

surface DA:

AROME OL_MAIN (CY40T1_bf07) is being cycled under test mode with GTS SYNOP data (first results available for a 20-day cycling period), but without blendsur.

upper-air DA:

BATOR (CY40T1_bf07): SYNOP, TEMP, AMDAR;

BATOR (CY43T2_bf10): tested for SYNOP, TEMP, AMDAR;

CY43T2_bf10: successfully test of: bator, screening, e927, e131 and e001;

B-matrix computed for ALADIN (6km);

6-hour pre-operational 3D-Var for ALADIN at 00,06,12,18UTC (CY40T1_bf07); for AROME (00,12UTC); B-matrix has been computed from AEARP downscaling and a 3D-Var cycling is being implemented for AROME at CY40T1_bf07; B-matrix has been computed from AEARP downscaling and a 3D-Var cycling is being implemented for AROME with an hybrid cycle (CY40T1_bf07 for BATOR and CT43T2_bf10 for 001); on-going validation of ALADIN 3D-Var with multiple observations types (1 week forecasts in three regions (north, interior and south, using ALADIN at dynamical adaptation; ALADIN 3D-Var with single observation (SYNOP) and ALADIN 3D-Var with the three types of observations (one per type); results (favourable for multi-observation type) are available.

Plans: compute a new B-matrix to ALADIN (6 km).

combined surface+ upper-air DA:

Plans: building a pre-operational version of 3D-Var cycle, combined with OI_MAIN, for AROME at CY43T2.

reported issues:

- a segmentation fault in the forecast step with INIT_SURF file when running blendsur routine (CY40T1_bf07) was still reported;
- a screening problem has been reported, when the 3 observation types are used (CY43T2_bf10): SYNOP, TEMP and AMDAR.

BELGIUM

data acquisition:

SYNOP, TEMP, AMDAR from GTS (BUFR), ground-based GPS (E-GVAP samples from Royal Observatory of Brussels, ROB).

data pre-processing:

Python script that deals with duplications and amends; SAPP (ECMWF) server is installed; GPS data is converted from COST format to GTS BUFR with an UK tool (met Office) from E-GVAP. In a first approach, statistics on the observation error had to be determined, in particular, mean bias and error density, which are used when varBC method is not in use. However, in this case a 'whitelist' has to be used to enable this observation type.

Plans: configuration of SAPP to local needs.

monitoring tools:

OBSMON is technically working but after the latest HIRLAM DA WD, when this problem was discussed, a prevailing problem remains; MANDALAY installation (CY43T2_bf10).

verification tools:

HARP.

surface DA:

3-hour cycling of an eflow suite for surface DA (OI_MAIN) was set in operational mode for CY43T2_bf10 by switching off CANOPY but without further validation from the one presented up to December;

CANARI surface analysis in ALARO (4km) is being cycled with a 3-hour frequency.

upper-air DA:

computing B-matrix for ALARO 4.0 and AROME 1.3 by the NMC method (period: 01.02.2019-01.08.2019);

3-hour cycling of 3D-Var setup for ALARO4.0 and AROME1.3.

combined surface+ upper-air DA:

BATOR (CY43T2_bf10): tested for SYNOP, TEMP, AMDAR;

3-hour cycling of 3D-Var+OI_MAIN (AROME1.3, CY43T2_bf10);

3-hour cycling of 3D-Var+CANARI (ALARO4.0, CY43T2_bf10).

Plans: to use GPS data with variational Bias Correction and other data sources like MODE-S and OPERA-ODIM radar;

validation of combined DA solution OI_MAIN+ 3DVar.

operational systems:

CY43T2 by surface DA (coupling with ARPEGE).

reported issues:

SQLite files from prep-OBSMON are delivered empty (see 'Recommendations & actions').

BULGARIA

data acquisition:

SYNOP, TEMP from GTS (BUFR), local SYNOP (converted to BUFR).

data pre-processing:

new tools to split compressed BUFR file into single BUFR file have been developed in-doors using eccodes; duplications are then removed using the same tools.

monitoring tools:

OBSMON, MANDALAY ported locally.

verification tools:

HARP ported and some tests just started; local surface verification tool.

surface DA:

BATOR (CY43T2_bf10): SYNOP (locally); AMDAR (tests in beaufix);

OI_MAIN (CY40T1_bf07) for AROME-BG was migrated from beaufix (Météo-France HPC platform) and cycled for 2 weeks with BUFR data and ODB validation; a newcomer has arrived and efforts are being put onto its training;

porting of surfDA for AROME-BG to CY43T2_bf10.

operational systems:

CY43T2 by dynamical adaptation is running in operational suite since November 2019:

ALADIN (105L/5km/72h/06,18UTC runs) and AROME(60L/2.5km/36h/06,18UTC runs);

Plans: 2 daily runs at (00UTC and 12UTC; so far shifted model runs); new machine in 2020.

MOROCCO

data acquisition:

GTS BUFR SYNOP (local and automatic), TEMP and AMDAR from GTS (BUFR); local GPS, ATOVS (BUFR).

monitoring tools:

OBSMON installation: on-going in the local machine.

verification tools:

HARP not yet.

surface DA:

BATOR (CY41T1): SYNOP, TEMP and AMDAR from GTS (BUFR); surface DA runs for AROME-MOROCCO in beaufix; waiting to port and cycle to the new local machine.

upper-air DA:

3-hour cycling 3D-Var for AROME-MOROCCO has been cycled in the new machine (CY41T1) and should enter in pre-operational suite up to the end of 2020; B-matrix diagnostics have been done, comparing the downscaling with the ensemble method.

combined surface+upper-air DA:

Plans: combined OI_MAIN+3DVar should now be cycled in the new machine and then ported at CY43T2 (beginning of 2021).

operational systems:

Plans: a new HPC platform has been acquired and the CY43T1_bf10 should enter into operations after CY41T1.

POLAND

data acquisition:

OPLACE data is used;

conversion of local SYNOP to BUFR.

monitoring tools:

OBSMON installed and tested with DAsKIT WD data (see reported issues).

verification tools:

HARP-v2 runs for DA cycle but not in use.

surface DA:

6-hour cycling of a surface DA based on CANARI (not SURFEX) for ALARO (CY40T1_bf07 and CY43T2_bf10), new LBC 4 km; 66-hour forecasts, introduction of new precipitation types.

AROME CY43T2 under test

operational systems:

ALARO CY43T2_bf10 (newLBC, 70L, 2.5km; 4x a day, up to 72h);

AROME CY43T2_bf10 (?L, 2.5km; 4x a day; up to 30h).

Plans:

AROME CY43T2_bf10 (?L, 2.5km; 4x a day; up to 36h)

reported issues:

OBSMON: problems when testing local data with graphical/shiny part of OBSMON; the implementation of the conversion tool (from the local experiment's output data to shiny recognised format) is missing.

PORTUGAL

data acquisition:

SYNOP, TEMP, AMDAR from GTS (BUFR); OIFS radar data.

data pre-processing:

local handling of duplications and amends (FORTRAN): SYNOP and TEMP (missing validation); following local implementation of SAPP (SYNOP WMO BUFR data).

monitoring tools:

home-made (metview plotting for SYNOP); local OBSMON_V3.3.2 (shiny part) and MANDALAY (CY40T1_bf07) implementation is on-going.

verification tools:

local (home-made IPRODS-IVERIF) surface verification tool;

Plans: HARP implementation.

surface DA:

3-hour cycling of a standalone surface DA scheme (OI_MAIN, CY40T1_bf07, AROME, 60L, 2.5km); on-going validation of 48-hour forecasts of AROME-PT2 (CY40T1_bf07, 60L/46L)

initialised by surface DA using as reference the same AROME-PT2 model configuration, initialised by dynamical adaptation for the two periods: WINTER: 10dez2018-10fev2019

(cold and rainy period); SUMMER: 01ago2018-09set2018 (extreme temperatures).

combined surface+ upper-air DA:

BATOR (CY43T2_bf10, ported to ECMWF): SYNOP, TEMP, AMDAR;

B-matrix computed by AEARP downscaling and tested in beaufix for AROME-PT2

OI_MAIN+3D-Var, with AROME DA VarBC (CY40T1); 20-day validation on beaufix platforms of combined AROME_PT2 OI_MAIN+3D-Var (CY42T2) has revealed a slightly improving using conventional + OIFS HDF5 volumetric data, in particular for larger amounts of 24-hour accumulated precipitation (Skill Scores and Probability of Detection), keeping the False Alarm Rates;

Porting beaufix experiment to the ECMWF machines (at CY43T2_bf10, with an adaptation of Slovenia (ARSO) scripts ported to ecgate): one network done; however screening is rejecting all Portuguese radar data; HOOOF tool was added for pre-processing; 'monitor' verification tool has been plugged-in, but it shows some issues.

operational systems:

dynamical adaptation of AROME-PT2 (CY40T1_bf07, 60L, 2.5km);

Plans: move to ECMWF computing platforms (CY43T2_bf10).

reported issues:

installing BATOR CY43T2_bf_09 installation in the local machine (IBM-p7) since the native compiler does not supports FORTRAN2008 features; installation in the local machine (IBM_p7) with gcc since it was not possible to install gcc compiler with older software on the machine which does have maintenance support.

'Monitor' executable aborts at ECMWF.

TUNISIA

data pre-processing:

OPLACE; local SYNOP; TEMP and WIND PROFILER.

monitoring tools:

OBSMON and MANDALAY implemented on the local machine.

verification tools:

HARP not installed.

surface DA:

BATOR (CY43T2_bf10, new HPC): SYNOP;

surface DA (OI_MAIN) has been implemented in beaufix but not yet on the local machine;

Plan: move to CY43T2_bf10 in the new HPC.

upper-air DA:

6-hour DA cycling (ALADIN, AROME).

combined surface+ upper-air DA:

B-matrix has been computed by the ensemble method and tested in beaufix for AROME;

Plans: to implement a combined surface + 3D-Var DA, with a Jk component on the new HPC platform.

TURKEY

data acquisition:

SYNOP and AMDAR from GTS (BUFR), local SYNOP (conversion to BUFR);

non-conventional observation: AMSUA, AMSUB-MHS (NOAA18-19 & METOP1-2, SEVIRI (METEOSAT11) and AMV (METEOSAT).

data pre-processing:

SAPP BUFR data (SYNOP) was tested with export version for local observations.

monitoring tools:

OBSMON has been installed and tested with provided observations; a python script has been created to visualize MANDALAY output.

verification tools:

Plan: HARP implementation.

surface DA:

BATOR (CY43T2_bf10): tested with local observations;

CANARI (CY43T2_bf10): tested successfully with local SYNOP (t2, rh2); diagnostics done for one SYNOP station; validation has been prepared for a 2-week period.

Plans: set-up of a surface DA (OI_MAIN) cycling to AROME-Turkey with corrected namelist.

combined surface + upper-air DA:

B-matrix has been calculated from AEARP at CY43T2 by the ensemble method;

Plans: set-up of a joint surface (OI_MAIN) + 3D-Var DA to AROME-Turkey.

operational systems:

CY43T2_bf10 is operational since September 2019 for AROME (72L, 1.7km and 48-h lead time);

CY40T1_bf07 is operational for ALARO (60L, 4.5km and 72-h lead time);

6-hour DA is being cycled for ALARO CY40T1 in test mode (at 00, 06, 12, 18UTC network times), at 4.5km, 60 levels and with LBC from ARPEGE; conventional observations: SYNOP GTS&local; TEMP local and AMDAR GTS; CANARI is used for surface DA and 3D-Var for the upper-air with 24-hour varBC. The model is integrated up to 48 hours.

reported issues:

screen-level parameters verification scores of AROME-Turkey when initialised by the surface data assimilation cycle are below the expected (for progress, see "Recommendations and actions" below).

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Main conclusions:

1. at the second quarter of 2020, all DAsKIT countries have the CY43T2_bf10 implemented in-doors (except Morocco and Portugal: the first country is now focused on implementing its local suites in the new machine; and Portugal, has moved its recent developments to ECMWF HPC platforms).
2. Concerning the implementation of DA algorithms, efforts for the validation and discussion of the DAsKIT set for surface DA have slowed down in almost all the countries, however this scheme has entered into operations in Belgium; besides,
3. most of the countries are focusing now their efforts on the local implementation of a 3D-Var algorithm or a combined algorithm of surface+3D-Var, namely: Algeria, Belgium, Morocco, Portugal, Tunisia and Turkey. This implementation is done by porting a previous set (Algeria, Turkey), by building the scheme from scratch (Belgium), or by migrating it from a reference environment (Morocco, Portugal, Tunisia). Bulgaria and Poland are at this moment blocked due to lack of computer power.
4. The second main concern of DAsKIT countries is the handling of locally available data. Main observation types are: SYNOP, TEMP, AMDAR and WindProfilers (Tunisia) under BUFR format from GTS or local networks; however, some countries are now concerned with the handling of non-conventional data (for instance, GNSS (Algeria), ODIM volumetric data (Portugal)):
5. so far, countries created pre-processing tools based on eccodes (ECMWF) to handle BUFR data, as it is the example of Belgium and Bulgaria. Pre-processing consists of removing duplicates from corrections and amends and filtering a certain type of BUFR template over a particular geographical area. Pre-processing is applied to SYNOP, TEMP and AMDAR, but removing duplicates on TEMP is a process missing to the most part of the DAsKIT countries.
6. in particular, Tunisia (as a non-ECMWF member country) has successfully implemented and tested the Belgium pre-processing PYTHON tool, being user friendly and simple to install; while
7. Turkey has successfully tested SYNOP BUFR data coming from SAPP on the local (CY43T2-export) BATOR version.
8. BATOR at CY43T2 has been tested for SYNOP, TEMP and AMDAR by Algeria, Belgium, Bulgaria (SYNOP), Portugal, Tunisia (SYNOP) and Turkey;
9. MANDALAY (CY40T1 or CY43T2) has been implemented and tested with demo data in almost all countries (still on-going for Portugal) and no issues have been reported so far. Turkey has their own set of scripts to do some data monitoring with MANDALAY;
10. OBSMON has been implemented and tested in almost all the countries with demo data (still on-going for Algeria and Portugal), but none has yet started to use it on a regular basis,

though Belgium has tested it with locally produced data and faced some issues (see 'Recommendations & actions');

11. HARP has not been implemented in most of the countries; some countries start to invest on MONITOR (HARMONIE system).

12. Issues have been reported still in configuration 001 when blendsur (in CY43T2) is used (see 'Recommendations & Actions').

13. Next DAsKIT video-conference will take place in November/December 2020 and a doodle to establish the appropriate dates will be set in advance.

Recommendations & Actions:

1. all countries are invited to document their issues in the LACE forum, on the page dedicated to DAsKIT issues <http://www.rlace.eu/forum/viewtopic.php?f=21&t=580>;

2. main goal for 3Q2020 is the validation of surfDA to CY43T2 in all countries (even if in comparison with 3D-Var or a combined surface+3D-Var solution); however,

3. countries which did not succeed to achieve the goal established for the 1-2Q2020 are invited to take advantage of the work already done by countries who did it.

4. Concerning the bad scores reported with the validation of surface DA so far, they should still be checked and Météo-France was contacted to give feedback on how to best tune surface DA.

5. The issue with blendsur, reported by Algeria, joint with some new information on the way ALARO is using blendsur was also shared and has still to be checked by the DA coordinator (see previous report).

6. Concerning the issue reported by Belgium on OBSMON (getting empty SQLite, Eoin Whelan informed that src/module_obstypes.f90 should be checked to ensure selected subtypes match ODB (ECMA and CCMA) content; if not, the code should be locally changed and the corresponding odb library re-compiled).

7. Concerning local code changes in order to ingest SAPP BUFR files, Eoin Whelan informed that BUFR table updates are made available at: <https://confluence.ecmwf.int/display/BUFR/Releases>;

8. besides, he provided the information that ECMWF have a nice page for monitoring SYNOP and TEMP availability: <https://confluence.ecmwf.int/display/TCBUF/Monitoring+Maps>.

9. Concerning the RMI pre-processing tool, Alex Deckmyn will try to organize an internet place to share this tool.

10. Concerning the planning of the "2020 Joint RC-LACE DAWD and DAsKIT DA WD", countries were recommended to answer Alena's Trojakova email on the suitable date and format of the event asap, and were also invited to provide their feedback on to best elaborate the Agenda of the meeting.