

Summary report of the 2019 DAsKIT WD, Prague, 18-20 September (from the joint discussion session).

See List of Participants and Agenda in attach.

The 2019DAsKIT Working Days (WD) were jointly planned with RC LACE in order to optimise efforts and share available expertise in the different topics of Data Assimilation (DA). The event was hosted by CHMI in Prague during 18-20 September and the local team took charge of its organization.

The event started with the welcome message passed by Radmila Brožková: some years ago we were struggling to show better results using Data Assimilation with respect to the dynamical adaptation and there were discussions whether it is worth to continue. Fortunately we have not given up the effort and today the added value of DA to model performance is clearly recognized. However, the wide range of observational systems (with different intrinsic errors) and the complexity of the methodologies to better filter the atmospheric phenomena signal from observational information, when initializing those models, leads us to a coordination of all the available intellectual capacity. In this way, RC-LACE is happy to host the DAsKIT program working days together with RC-LACE DAWD and welcomes the willingness of its participants to contribute to a common know-how.

These WD followed the same structure as last year. The first day was dedicated to the joint presentation of the national status reports as well as to the presentation of the progress on specific DA topics among the consortia (SAPP in HIRLAM, OPLACE in RC LACE, surface in Météo-France (MF; cancelled because of technical reasons) and upper-air DA in HIRLAM). During the second day, the two groups (LACE and DAsKIT) were split taking into account its actual main developments. DAsKIT sessions, in particular, were dedicated to the validation and diagnostics of surface Data Assimilation; to pre-processing of AMDAR BUFR; to the scientific aspects of B-matrix computation and diagnostics; to 3D-Var initial steps and verification packages. Finally, on the last day, joint and separate discussions have taken place in order to better plan future actions and the RWP2020.

During last years' WD it was emphasized Data Assimilation systems implementation requires a change in mentality (when compared to downscaling initialisation) since a cycling dependency has to exist between different model runs; besides, tools have been prepared to allow DAsKIT countries to implement a cycling system in-doors. This year the main topic was a natural sequence of the work done by countries since last years' WD. Main achievements encompass:

1. this year the staffing issue was less reported, but some countries were still devoting their major efforts to the acquisition of new machines (Morocco and Tunisia) or to the new cycle porting.
2. 4/8 countries (Algeria, Belgium, Poland and Portugal) have shown preliminary results on surface DA.

3. as expected, preliminary scores (CY40T1 or CY43T2) seem to indicate surface DA has an impact over screen level fields (H2M and T2M): dependent on the diurnal cycle (positive for a stable SBL (night time); negative for an unstable SBL (day time)); broader for H2M than for T2M. The impact over the V10M depends on lowest model level.
4. T2M and H2M scores show a contrast from the initialisation to the remaining model time steps and this should be further investigated.
5. the impact, over T2M and H2M forecasts performance, due to the computation method of the T2M during the coupling files generation (LNOTS_T=TRUE or =FALSE) was illustrated.
6. diagnostic tools/actions, specific for the analysis of surface DA, based on the A-H common Data Assimilation training available for the website at <https://hirlam.org/trac/wiki/HarmonieSystemDocumentation/Training/HarmonieSystemTraining2019>, were prepared and shared in beaufix.
7. a common action on AMDAR pre-processing took place, based on the experience of DASKIT colleagues (Algeria and Morocco). In particular, an application of the tool bufr_filter was experienced as well as the technique for back-phasing.
8. a set of scripts on CY40T1 for combined surface+3D-Var (from Máté Mile, OMSZ) has been shared in beaufix in order to allow DASKIT to start learning from it. Note that it should be updated (in particular by taking into account the surface DA basic kit shared last year) and ported to CY43T2.
9. a review on B-matrix computation was provided by DASKIT colleagues (Morocco and Tunisia); besides, the studies of Jk over Tunisia Mediterranean were announced.
10. the progress on the latest developments of the HARP verification tool was reported and the Rfa tool to handle FA files was demonstrated after being ported to beaufix.
11. a live demonstration of the OBSMON tool was performed (Roger Randriamampianina, RR) and countries were invited to request a login user on the hirlam.org page to Daniel Santos in order to access the standalone package.

The following remarks from DASKIT, RC LACE (and HIRLAM) discussions with interest for DASKIT activities, were outlined:

12. B-matrix diagnostic tools are available from RC LACE web page (<http://www.rclace.eu/forum/viewtopic.php?f=30&t=62&start=20#p2143>).

13. the perturbation of observations in order to create a B-matrix by the EDA method is done through “screening” tasks (LPERTURB).

14. Rfa has been installed in beaufix and can be used as a reference once migrated to the local systems (see /home/gmap/mrpe/deckmyn/public/R-libs).

15. the libraries of ODBSQL should be enough to install the post-processing part of OBSMON (it was proposed to do an installation in beaufix platforms, but that would need ODBSQL; at ECMWF platforms these libraries are available on the environment).

16. SAPP BUFR templates for SYNOP, TEMP and AMDAR have to be tested in BATOR (CY43T2); tests with SAPP BUFR SYNOP in BATOR (CY40T1) were not recognised by the software; support may need to be asked to Ireland colleagues.

17. on the warming up of the surface DA it was pointed out (RR) that the analysis error convergence can take up to 1 year of cycling; however for the upper-air this warming up is shorter. In order to access to rapid experiment results, some countries use a typical period of 10 days.

18. DAsKIT participants emphasized the need to access regular DA users' training, as the recent 2019 A-H common training on Data Assimilation, held in Budapest. The training material is available from <https://hirlam.org/trac/wiki/HarmonieSystemDocumentation/Training/HarmonieSystemTraining2019> and countries were suggested to take a look. The possibility to use this material on a remote webinar session in order to not overload the lecturers was mentioned (RR and Piet Termonia) which was very welcome by the DAsKIT participants.

19. DAsKIT participants have shown less commitment to attend the DA coding training and have shown interest in just a few topics: the 2D_OI scheme and on B-matrix modelling (including Jk).

20. the revisiting of the ALADIN RWP2020 was announced: it pointing out to a step-by-step strategy to allow an optimal and parallel progress on the DAsKIT countries. Countries were suggested to update their expected commitments.

21. all countries were invited to document their issues at the LACE forum, on the page dedicated to DAsKIT issues <http://www.rclace.eu/forum/viewtopic.php?f=21&t=580> or to the DA coordinator.

22. all countries were invited to follow the DAsKIT actions through the ALADIN dedicated web page at <http://www.umn-cnrm.fr/aladin/spip.php?rubrique74>

23. E-GVAP data will soon be available through OPLACE. For networks with status “operational” data will be provided in BUFR. For the “test” networks which are shared as ASCII files, the conversion script to OBSOUL format will be provided.

24. Importance of QC was emphasized in several LACE presentations. It is recommendable to perform updates to the local black/whitelist, especially when using observations not assimilated at MF (e.g., automatic stations in LACE).

25. radar observations from OPERA are more and more investigated in LACE. As a first step only reflectivity would be used, due to problems with wind aliasing. The homogenization software (HOOF) is available on LACE forum.

The following coming events with interest to DAsKIT were announced:

23. HARP (users) training will occur during October at the DMI.

24. Working Days in 2020 will continue to be joint with LACE. It will be hosted by ZAMG in Vienna. The structure of the event will encompass:

DAY 1 - Joint national status report;

DAY 2 - MORNING: Joint dedicated topics presentation; AFTERNOON: DAsKIT practical session; ('OBSMON practices' is a possible candidate, but other topics proposals are welcome);

DAY 3 - MORNING: Joint and separated conclusions & planning sessions.

25. the last 2019 video-conference will take place in December 2019 and a doodle should be arranged in order to choose the appropriate date.

As for next (short-term) steps for DAsKIT countries, it was decided:

i) the tuning and joint validation of a basic surface DA set (either at CY40T1 or CY43T2 depending on the country) will continue;

ii) the joint pre-processing of TEMP (WMO BUFR);

iii) the step-by-step move to a combined solution of surface+3D-Var DA (CY43T2); in particular,

iv) the joint porting of BATOR to CY43T2 during the 1Q2020.

Joint LACE Data Assimilation Working Days and ALADIN Data Assimilation basic kit Working Days

18-20 September 2019, Prague

Wednesday (18th September 2019), between 9:00 – 18:00

- 09:00 – 09:15 Welcome and Opening
09:15 – 10:30 First common block of progress/status presentations, 15 min/pres.
Algeria, Bulgaria, Poland, Portugal, Morocco
10:30 – 11:00 **Coffee break (Room 1)**
11:00 – 12:00 Second common block of progress/status presentations, 15 min/pres.
Tunisia, Turkey, Austria, Hungary
12:00 – 13:30 **Lunch break**
13:30 – 14:45 Third common block of progress/status presentations, 15 min/pres.
Croatia, Belgium, Czech Republic, Slovakia, Slovenia
14:45 – 15:15 Discussion
15:15 – 15:45 **Coffee break (Room 1)**
15:45 – 16:00 Status of Surf DA in Météo France (C. Birman, remotely)
16:00 – 17:00 Questions to Météo-France (C. Birman, C. Fischer, remotely)
17:00 – 17:15 Status of SAPP (R. Darcy, remotely)
17:15 – 17:30 Status of OPLACE (A. Trojakova)
17:30 – 17:45 Status of HIRLAM upper-air DA activities (Roger Randriamampianina)
17:45 – 18:00 Discussion (questions to HIRLAM)

DAWD (Room 1)

Thursday (19th September 2019), between 9:00 – 18:00

- 09:00 – 10:30 Session on radar data assimilation
- Features of Bator cy46 in cy43 (M. Neštiak)
 - Dealiasing of radial winds (V. Švagelj)
 - Assimilation of OPERA reflectivity data: first trial (B. Strajnar)
 - Discussion on radar DA
- 10:30 – 10:50 **Coffee break (Room 1)**
- 10:50 – 12:00 Session on upper-air data assimilation
- VARQC under the framework of AROME-RUC (F. Meier)
 - QC analysis of SYNOP, wind profiler, AMV/HRW and aircraft observations. (A. Bučánek / A. Trojáková)
 - Discussion on upper-air observations
- 12:15 – 13:30 **Lunch break**
- 13:30 – 15:30 Session on upper-air data assimilation (cont.)
- Mode-S data assimilation at SHMU (K. Čatlošová)
 - Current work on attenuation of microwave links (P. Smerkol/B. Strajnar)
 - Discussion on E-GVAP dissemination and data assimilation (intro. by A. Trojáková)
 - Experiments with hourly RUC (A. Várkonyi)
- 15:30 – 16:00 **Coffee break (Room 1)**

DAsKIT (Room 2)

Thursday (19th September 2019), between 9:00 – 18:00

- 09:00 – 10:30 Session on diagnostics and validation of surface data assimilation
- Diagnostics and validation
 - Practical session
- 10:30 – 10:50 **Coffee break (Room 2)**
- 10:50 – 12:00 Session on diagnostics and validation of surface data assimilation (cont.)
- Practical session (cont.)
 - Discussion
- 12:15 – 13:30 **Lunch break**
- 13:30 – 15:30 Session on upper-air data assimilation
- B-matrix computation overview (F. Hdidou)
 - B-matrix diagnostics (W. Khalfaoui)
 - Discussion
 - Moving to Upper-air DA: DAsKIT upper-air 3D-Var KIT (intro by M. Monteiro)
- 15:30 – 16:00 **Coffee break (Room 2)**

DAWD (Room 1)

16:00 – 18:00 Session on surface data assimilation

- SURFEX/surface data assimilation (J. Vural/S. Schneider)
- Offline soil moisture analysis within SURFEX-SODA framework (V. Tarjáni)
- Discussion on surface DA

DAsKIT (Room 2)

16:00 – 17:00 Session on pre-processing

- Issues with AMDAR pre-processing (I. Dehmous, remotely)
- Issues with AMDAR pre-processing (Z. Sahlaoui, remotely)
- Practical session

17:00 – 18:00 Session on verification

- Status of HARP verification tools (A. Deckmyn)
- Practical session

Friday (21st September 2018), between 9:00 – 12:00

09:00 – 10:00 Common discussion DAWD and DAsKIT (status M. Monteiro, B. Strajnar)

10:00 – 10:20 Coffee break (Room 1)

DAWD (Room 1)

10:20 – 12:00 LACE DA discussion and planning

DAsKIT (Room 2)

10:20 – 12:00 DAsKIT final discussion and planning: conclusions and further actions on pre-processing of conventional observations, surface data assimilation validation, upper-air data assimilation and verification.

List of DAWD participants

Antonín Bučánek (CHMI, Czech Republic)
Alena Trojáková (CHMI, Czech Republic)
Radmila Brožková (CHMI, Czech Republic)
Patrik Benáček (CHMI, Czech Republic)
Antonio Stanešić (DHMZ, Croatia)
Suzana Panežić (DHMZ, Croatia)
Mario Hrastinski (DHMZ, Croatia)
Martina Tudor (DHMZ, Croatia)
Benedikt Strajnar (ARSO, Slovenia)
Vito Švagelj (ARSO, Slovenia)
Michal Nestiak (SHMU, Slovak Republic)
Martin Imrišek (SHMU, Slovak Republic)
Viktor Tarjáni (SHMU, Slovak Republic)
Katarína Čatlošová (SHMU, Slovak Republic)
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Florian Meier (ZAMG, Austria)
Jasmin Vural (ZAMG, Austria)
Anikó Várkonyi (OMSZ, Hungary)

List of DAsKIT participants

Mohamed Mokhtari (ONM, Algeria)
Alex Deckmyn (RMI, Belgium)
Piet Termonia (RMI, Belgium)
Boryana Tsenova (NIMH, Bulgaria)
Rilka Valcheva (NIMH, Bulgaria)
Bogdan Bochenek (IMGW, Poland)
Maria Monteiro (IPMA, Portugal)
Haythem Belghrissi (INM, Tunisia)
Roger Randriamampianina (MetNorway, Norway)