Progress on the CORE programme on DA

http://www.umr-cnrm.fr/aladin/

Goals *vs.* achievements

SPDA Goal: develop a cross-consortia coordination to set-up a basic 3D-Var data assimilation cycle with a limited set of observations suitable for operational implementation

1. Data acquisition
2. Data pre-processing
3. BATOR pre-processing
4. Surface Data Assimilation
5. Combined surface+upper-air Data Assimilation
6. Conclusions & Outlook

After the Joint RC-LACE DA & DAsKIT Working Days…

Data Acquisition

Goal (till 2020): local acquisition of WMO BUFR SYNOP, TEMP, (E-)AMDAR

. GTS BUFR SYNOP, TEMP: *Algeria, Belgium, Bulgaria, Morocco, Portugal, Turkey*

. GTS BUFR E-AMDAR: *Algeria, Belgium, Morocco, Portugal, Turkey (missing: Bulgaria)*
PLANS (short-term): Bulgaria will check if can get E-AMDAR locally

. OPLACE users: *Poland,Tunisia*

PLANS (long-term): GPS, OIFS radar, ATOVS, ASCAT ???

Data pre-Processing

Goal (till 2020): WMO BUFR SYNOP, TEMP, (E-)AMDAR

. SYNOP (duplications between original GTS messages and retards): *Algeria, Belgium, Bulgaria, Portugal (missing: Poland→OPLACE, Tunisia→OPLACE, Turkey→SAPP)*

. TEMP (duplications due to amends should have similar rules as SYNOP and in CY43T2 there is nothing to be done in BATOR):
PLANS (short-term): DAsKIT partners should start pre-processing TEMP

. AMDAR (no duplications, but needs the filtering of descriptor 311001): *Algeria (missing: all the others)*
PLANS (short-term): do we need other descriptors ? See question/answer to M-F
PLANS (long-term): SAPP (ECMWF) -> *Belgium, Bulgaria, Portugal, Turkey*

BATOR pre-Processing

Goal (till 2020): WMO BUFR SYNOP, TEMP, (E-)AMDAR

. conventional observations at CY40T1: *Algeria, Bulgaria, Morocco(CY41T1), Poland, Portugal, Tunisia, Turkey*

. conventional observations at CY43T2: *Belgium*
PLANS (short-term): DAsKIT partners will port BATOR to CY43T2 pre-processing during the 1Q2020

PLANS (long-term): blacklisting, adapt to SAPP BUFR data, new conventional and not conventional data types ??

Surface Data Assimilation

Goal (till 2020): CANARI (with in-line OI_MAIN > AROME)

. Local cycling under testing/validation: *Algeria, Belgium, Bulgaria, Poland (ALARO with CANARI), Portugal, Turkey (missing: Morocco*, Tunisia*); *new machine*

. Issues: BATOR (HDF5 should be complied and linked at 1.10 library at least), blendsur, T2M/H2M (H+00), LNOTS_T

PLANS (short-term): countries will validate the surface DA in the cycles they already installed locally,

Cycle 40T1: *Algeria, Bulgaria, Poland, Portugal, Morocco, Turkey*
Cycle 43T2: *Belgium, Bulgaria, Tunisia*

Goal: observations monitoring (OBSMON)
. Local installation: *All*
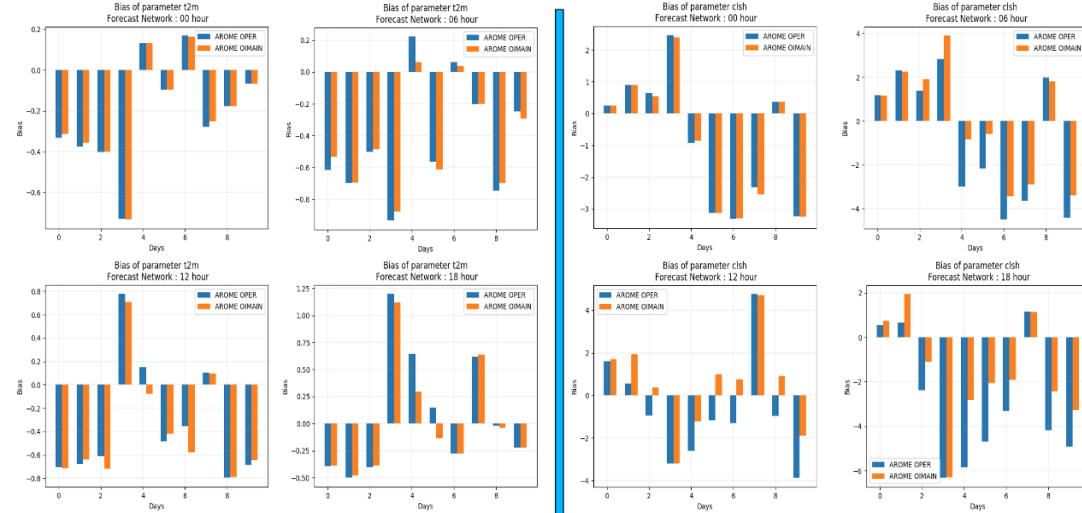. Local implementation: *None*

Surface Data Assimilation

Preliminary results (Verification using observation)
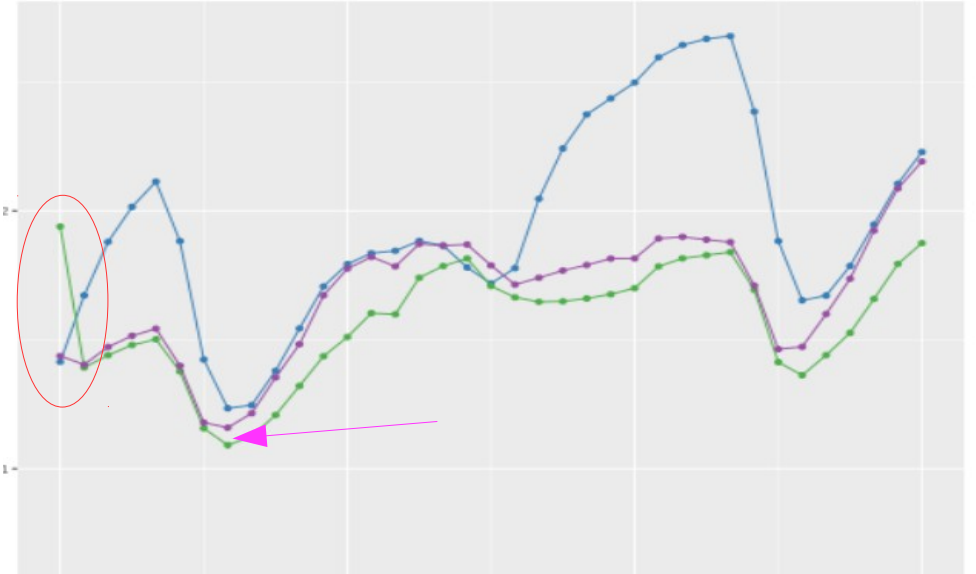**(Comparison between AROME-OPER and CANARI-OIMAIN**

AROME-Algeria

T2m scores for AROME Oper and CANARI-OIMAIN
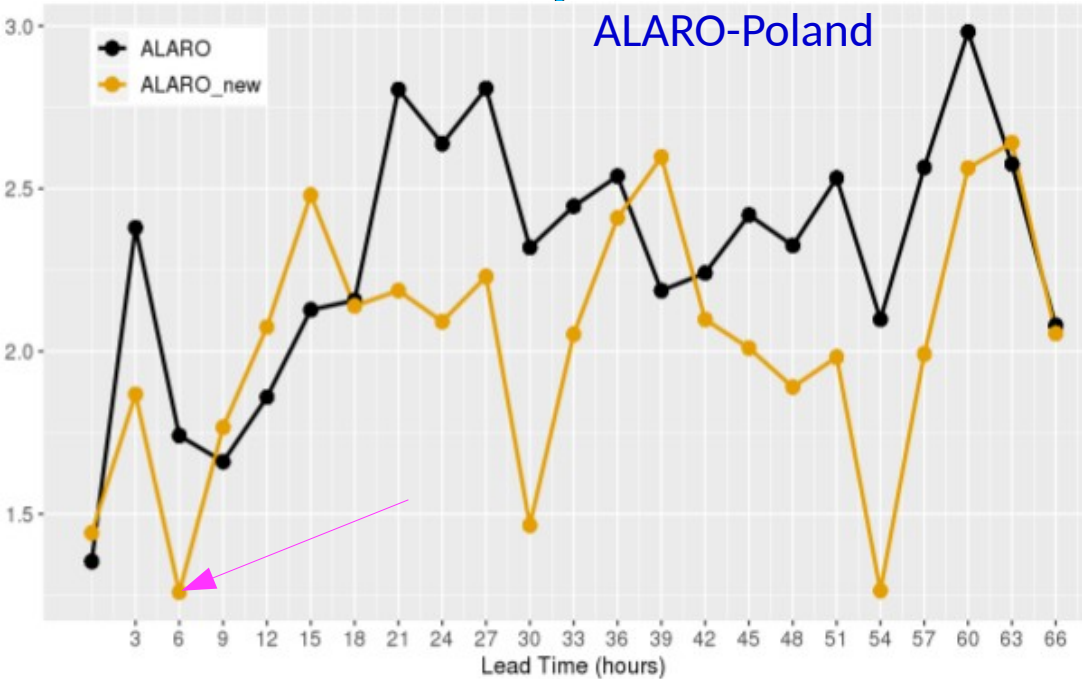for the four Networks : 00 , 06 , 12 and 18h

H2m scores for AROME Oper and CANARI-OIMAIN
for the four Networks : 00 , 06 , 12 and 18h

AROME-Belgium
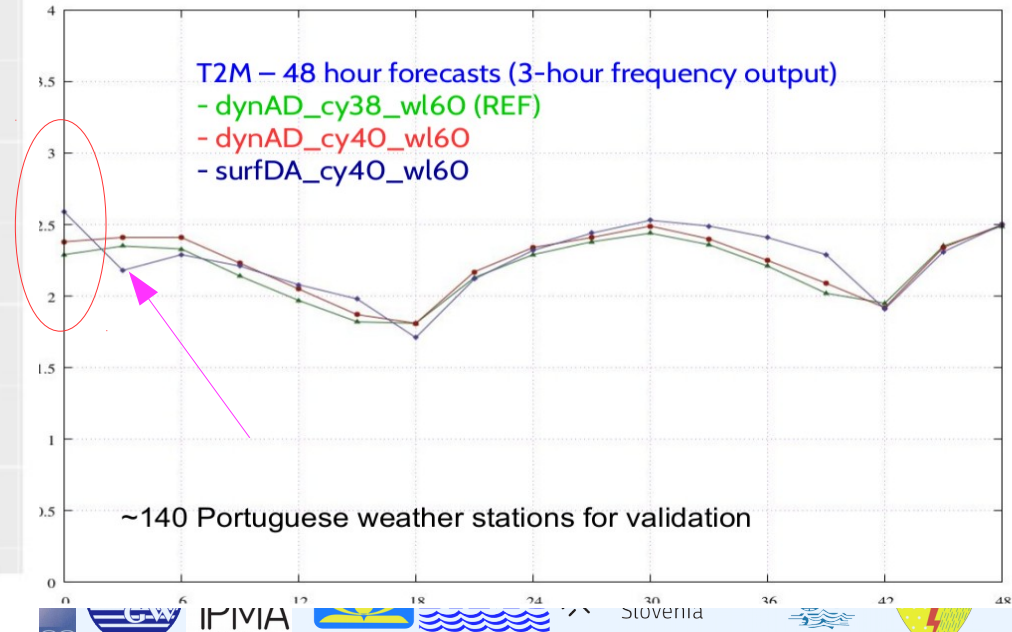

RMSE T2m
20190601 - 20190831 00h
Aggregated over all stations

ALARO-Poland

- ALARO
- ALARO_new

Lead Time (hours)

AROME-Portugal

ALLCITIES : 2018121100 - 2019010400

T2M – 48 hour forecasts (3-hour frequency output)
- dynAD_cy38_wl60 (REF)
- dynAD_cy40_wl60
- surfDA_cy40_wl60

~140 Portuguese weather stations for validation

Combined surface+upper-air Data Assimilation

Cycle 40T1: *Turkey*
Cycle 43T2: *Belgium*
PLANS (short-term): local installation as well as its implementation will be done at CY43T2. DAsKIT partners will try to have parallel progress to minimize the efforts by sharing experiences; therefore its implementation will be done step by step; the first of it will be the parallel porting of BATOR from CY40T1 to CY43T2 during 1Q2020. A set of scripts for the AROME and ALARO combined DA assimilation will be created and shared in beaufix taking into account the expertise of RC-LACE and Belgium.

Conclusions & Outlook

1. 4/8 DAsKIT countries have shown validation results on surface DA

2. scores (CY40T1) indicate surface DA has an impact over H2M and T2M: dependent on the diurnal cycle (positive for a stable SBL (night time); negative for an unstable SBL (day time)); more positive to H2M than for H2M. The impact over the V10M depends on lowest model level

3. a Summer scores degradation (T2M,H2M) at the model initialization (with SURFEX) at CY40T1: the diagnostic of these parameters at the initial time does not seems to be consistent with its prognostics at the model time steps...

4. LNOTS_T flag at the coupling namelists (CY40T1) has an impact over screen level parameter fields (Summer) when running the model by dynamical adaptation (in comparison with CY38). Its effect seems to arrive from the lateral boundaries since is revealed at each time step but it should be studied (not shown)

Conclusions & Outlook

5. New outcomes from 2019DASKIT WD are shared from beaufix:
  . Surface DA diagnostics tools
  . AMDAR pre-processing tools (BUFR filtering and BATOR back-phasing)
  . An outdated (still) set of scripts (CY40T1) to perform the combined surface (OI_MAIN)+upper-air (3D-VAR) Data Assimilation for AROME (read attentively the READ.ME files)
  . an installation of Rfa package
  . a list of questions was prepared to Météo-France

6. The RWP2020 was revisited. Focus will be put on:
  . pre-processing of TEMP (WMO BUFR)
  . joint porting of BATOR to CY43T2 (1Q2020)
  . finish validation of surface DA
  . tackle combined surface+upper-air DA (CY43T2), on a step-by-step approach

7. Coming events

2020 DAsKIT WD > next year Working Days will continue to be joint with LACE. They 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 **NEW !!!**; 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

DAsKIT video-conference > December 2019 (a doodle to chose the day will be prepared)

DA users training > should be possible each two year ! the suggestion (from HIRLAM and ALADIN PM) to organise it remotely is an option

DA coding training > there is less commitment due to local short man power problems, but there is interest for the following topics: 2D-OI scheme (CANARI); B-matrix modelling (including JK)

THANKS for your attention !