



# Core program on Data Assimilation

<http://www.cnrm.meteo.fr/aladin/>



# The ALADIN strategy 2008-2017

## 2008:

“as regional observing systems develop, data assimilation will become the main factor in the short range forecast performance of NWP institutes: most partners will run their own 3D-Var data assimilation, use a neighbouring country's assimilation, or face increasing challenges about their national NWP activity. **The use of regional data assimilation means a growing interdependence between NWP and regional observing system deployment & processing.** The bigger NWP centres will start using simplified versions of 4D-Var and ensemble data assimilation;”

Operational configurations	RUN OVER															
	Algeria	Belgium	Bulgaria	Morocco	Poland	Portugal	Tunisia	Turkey	Austria	Croatia	Czech Rep	Hungary	Romania	Slovakia	Slovenia	France
Algeria	ALADIN 12							ALADIN 12	ALADIN 12							ALADIN 12
Belgium		ALARO 4														
Bulgaria			ALADIN 7													
Morocco	ALADIN 18	ALADIN 18	ALADIN 18	AROME 2.5		ALADIN 10	ALADIN 18	ALADIN 18	ALADIN 18	ALADIN 18	ALADIN 18	ALADIN 18	ALADIN 18	ALADIN 18	ALADIN 18	ALADIN 18
Poland		ALARO 4	ALARO 4		AROME 2.5				AROME 2.5	ALARO 4	AROME 2.5	AROME 2.5	ALARO 4	AROME 2.5	AROME 2.5	
Portugal						AROME 2.5										
Tunisia							ALADIN 12									
Turkey			AROME 2.5					AROME 2.5		ALARO 4.5			ALARO 4.5		ALARO 4.5	
RUN BY	Austria		ALARO 5						AROME 2.5	AROME 2.5	AROME 2.5	AROME 2.5		AROME 2.5	AROME 2.5	
	Croatia								ALARO 8	ALARO 2	ALARO 8	ALARO 8		ALARO 8	ALARO 2	
	Czech Rep		ALARO 4.7	ALARO 4.7		ALARO 4.7			ALARO 4.7	ALARO 4.7	ALARO 4.7	ALARO 4.7	ALARO 4.7	ALARO 4.7	ALARO 4.7	
	Hungary		ALARO 8	ALARO 8		ALARO 8			ALARO 8	ALARO 8	ALARO 8	AROME 2.5	ALARO 8	AROME 2.5	AROME 2.5	
	Romania			ALARO 6.5						ALARO 6.5	ALARO 6.5	ALARO 6.5				
	Slovakia		ALARO 9	ALARO 9		ALARO 9			ALARO 9	ALARO 9	ALARO 9	ALARO 9	ALARO 9	ALARO 9	ALARO 9	
	Slovenia		ALARO 4.4						ALARO 4.4	ALARO 4.4	ALARO 4.4	ALARO 4.4		ALARO 4.4	ALARO 4.4	
	France		AROME 1.3													

ALADIN/ALARO/AROME configurations

horizontal resolution in km

with DA without DA

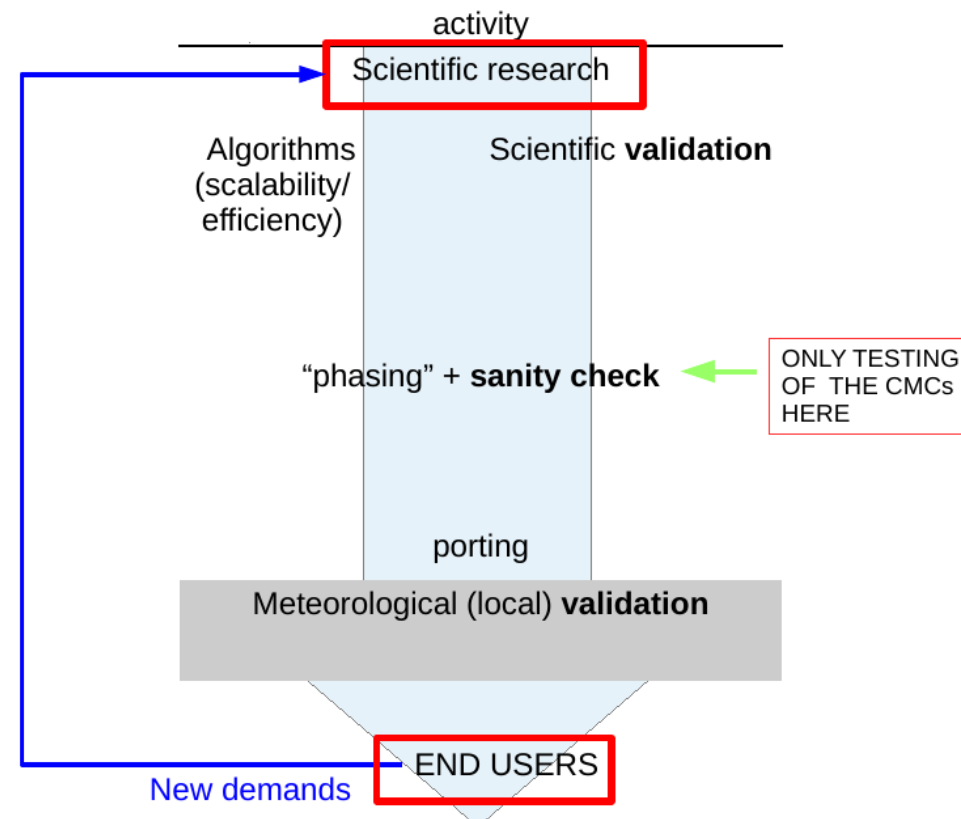




# Identification of common and specific activities (possibly of core and optional programs)

Common activities	Are necessary to create the export versions: code architect (CA), coordination (ACNA), Code Versioning (CV) for the export cycles. Basically activities to execute the “ <b>From science to operations</b> ” diagram. These are subject to <b>ToRs</b> .
Core programs	commonly agreed program of recognised strategic importance that will benefit all partners
Specific activities	all activities carried out outside of the core programs that, <ol style="list-style-type: none"> <li>1. are needed by a limited group of member states who invest resources in it. (this include initiatives by one single Member). <b>OR</b></li> <li>2. do not lead in the short term to the creation of a new CMC or a major extension of the sanity check <b>OR</b></li> <li>3. are not needed to guarantee operations</li> </ol>

## From science to operations





# Ownership (what is the common code?)

5.1 For the duration of this Agreement the definitions shall be the following:

The shared ALADIN-HIRLAM System shall mean the complete code that is necessary for executing all configurations that are part of the agreed collaboration according to this Agreement. The ALADIN-HIRLAM System is composed of shared codes of four different types:

the ALADIN Common Codes, defined as the codes jointly developed, maintained and owned by the ALADIN Consortium;

the HIRLAM Common Codes, defined as the codes jointly developed, maintained and owned by the HIRLAM Consortium;

the ALADIN-HIRLAM Common Codes defined as the codes jointly developed and maintained by both consortia;

## AH agreement:

- These definitions are based on **configurations**.
- There is an endless number of configurations.
- We only commit (both in sanity checks as in support for porting) to a limited number of configurations: the **Canonical Model Configurations**.
- **The ALADIN-HIRLAM Common Codes** should be based on the CMCs.
- I propose to define **common activities** as the activities that lead to **common codes**.





# Terminology (for the time being)

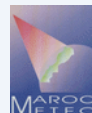
- HARMONIIE is the HIRLAM RCR
- Use ALADIN-HIRLAM System for the rest





# Core program on a DA basic kit

- A first web meeting took place to discuss the feasibility of a core program on DA
- Participants: J. Onvlee, P. Termonia, R. Randriamampianina, D. Santos, M. Mile, C. Fischer, A. Trojakova, M. Derkova, D. Degrauwe, A. Deckmyn.
- Next actions:
  - Make an inquiry among LTMs about their interests, expectations and plans to install data assimilation. This could be ACNA task => call ACNA videoconf shortly after GA
  - Based on the inquiry outcomes propose & organize a flat-rate working days/week to discuss plans for the basic DA kit, define the work needed and discuss potential problems (to list too complex pbs that are foreseen)
  - Make a doodle for the dates - early in 2017, well in advance before the LTM and HMG-CSSI meetings in Helsinki, 2.-7.4.2017
  - post-meeting note by AT: inquiry also on which CMC the data assimilation is planned? AROME (1-2km) or ALARO/ALADIN (4-10km)?





# DA basic kit

- For those countries who want to join, should know that
  - The main difficulty is in the local handling of the observational data. It has been said during the meeting that OPLACE might provide the best solution. Possible use of OPLACE as to discussed
  - data assimilation requires a different state of mind than downscaling. You have to maintain a data assimilation cycling process.
  - It can not be promised to provide a system that is capable of assimilating all of the data (e.g. some data handling can be local in your Institute).
  - **It requires at least 1 FTE from your team (to be sent to the kick-off meeting)**
  - A stepwise approach will be taken starting with a simple system.
  - HIRLAM plans to rewrite its scripting system. This can be an opportunity to write it together and make it part of the AH Common Codes.





# Remarks (see document Alena)

- Project (with clear operational deliverables) should be feasible for any country with dedicated manpower. Considering that 3DVAR and surface OI analysis is operational in many countries, it is feasible to have operational 3DVAR and surface OI with conventional (SYNOP, TEMP, AMDAR) observations in 2-3 years (assuming availability of computing and human resources 1-2FTE).
- We need a coordinator: someone in this group?







# Observation preprocessing (document Alena)

- Preprocessing of observations basically means to
  - get data from GTS (mainly in BUFR format – I have to check the status of TAC2BUFR migration for North Africa, Turkey and Bulgaria)
  - store data in a local database (or in a directory structure on disk) and handle somehow GTS duplication and corrections messages!
  - convert GTS data to ODB format (via BATOR).





# Installation of atmospheric (3DVAR/blending) and surface (OI) analysis systems (document Alena)

- compile all executables/model configurations (e002, e131, e701, OI\_MAIN) and additional tools (odbtools, addsurf, blend, ...)
- prepare scripts to test the configurations + setup of assimilation cycle / scripting system
- validate all configurations to avoid porting issues in compilations & scripts
- in order to run e131 (upper-air 3DVAR analysis) one needs the background errors, which are domain specific. There exists tricks to interpolate background errors from the larger domains, but I would not suggest to use this option.
- pre-operational evaluation/testing.





# Benefit from the DA in the global model?

- Blending?
- Nudging methods?





# Remarks/questions

- The ALADIN-HIRLAM scripting system (**link with HIRLAM**, Daniel)
- Observations to be used: SYNOP, TEMP, AMDAR (?)
- Work on BATOR (**link with HIRLAM**, Eoin)
- Use OPLACE (?)
- Avoid duplication of work
- How to deal with the spread in computational resources
- Obsql
- Work on a common (frozen?) cycle.
- Scripting system should be well designed. What is the timescale do develop it?
- Having a reference setup in MF or ECMWF? Ask for a special project?
- Scientific aspects, training/exchange of expertise (University of Ghent?)





# SCOPE of the meeting

For each work package:

Work package lead							
Work package title							
Short name of participant							
Person/months per participant:							

Objectives

Description of work (where appropriate, broken down into tasks), lead partner and role of participants

Deliverables (brief description and month of delivery)

Code contributions (brief description, month of delivery and cycle)

- *Write the core plan:*
  - Understand the needs of the participants
  - Make a realistic plan



Thank you for your attention

