ALADIN status review

http://www.cnrm.meteo.fr/aladin/
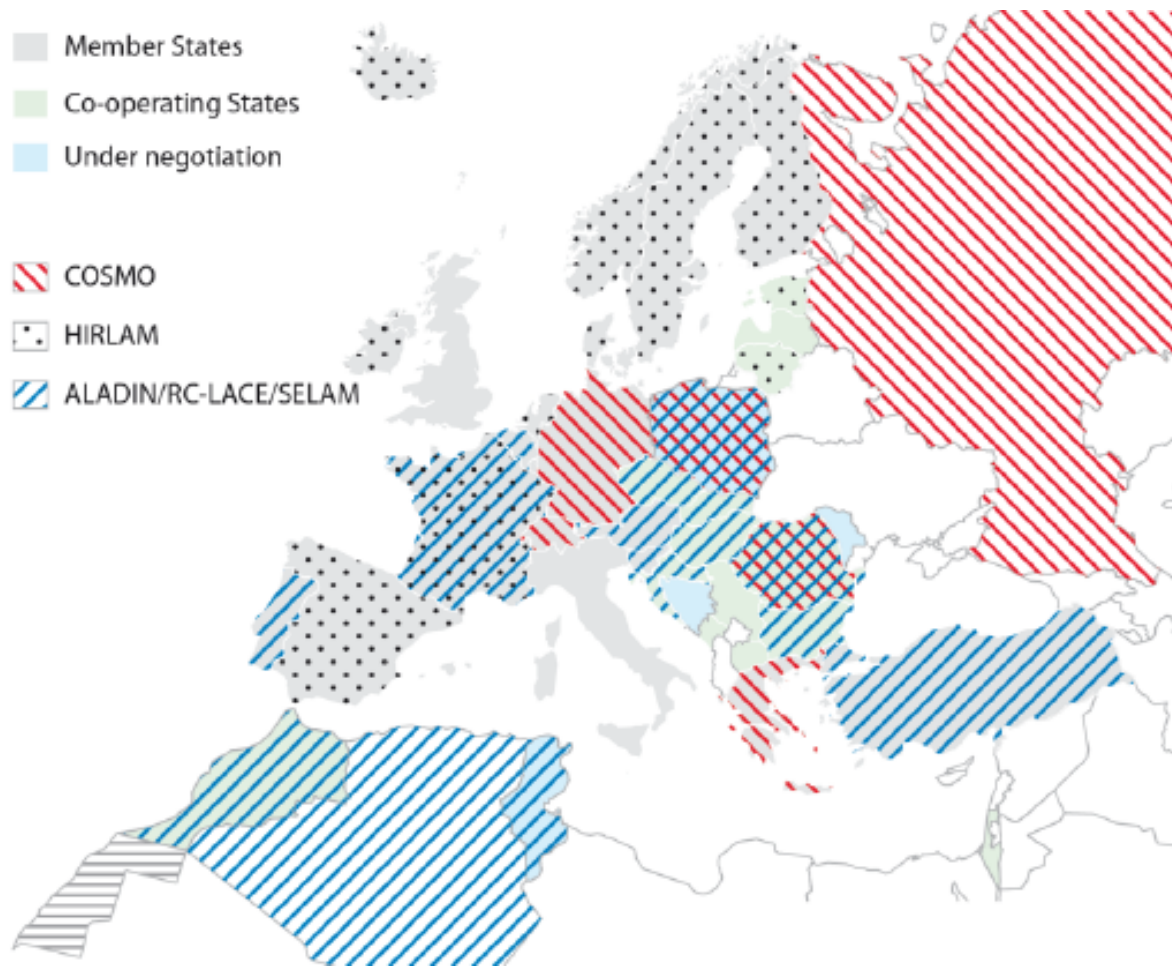
How the world sees us

26 countries working/delivering a *shared code/model* (taken from the ESCAPE project)

Governance

- PAC/HAC meeting:
  - Clarification on used terminology:

  HAC/PAC recommended to use the ALADIN-HIRLAM shared system as a name for the common system, HARMONIE being only used for HIRLAM Reference model (RCR).

  PAC/HAC recommended a clear action on the PMs : to define and propose for approval at the next joint ALADIN GA & HIRLAM Council meeting the list of the potential ALADIN-HIRLAM common codes with the identification of the ALADIN and the HIRLAM contributions to these common codes and the mutual commitment to the maintenance of these codes. In case of disagreement during the establishment of this list, the controversial points should be submitted to HAC/PAC for an email consultation[2].

  Bengtsson et al. 2017

- General Assembly/HIRLAM Council:
  - Signature of the new ALADIN-HIRLAM collaboration agreement!

Five issues to be clarified

2. ALADIN and HIRLAM consortia will work together with the aim of forming one single consortium by the end of the 2016-2020 MoUs. To this aim, the following issues have to be resolved:

- code ownership (software IPR) : current situation and suitable evolutions. In particular advantages vs drawbacks of open source solutions should be assessed;
- data policy (access to model outputs) ; to this aim a map of the various current operational configurations of the limited area system should be produced and scenarios for data dissemination should be assessed;
- global picture of annual contribution of countries to the various types of activities (from fundamental research to code implementation);
- identification of common activities and specific activities (possibility of core and optional programs);
- branding (including suitable evolution of the name of the system).

Ownership (what is the common code?)

AH agreement:

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;

- These definitions are based on *configurations.*

- There is an unlimited number of configurations.

- We 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.

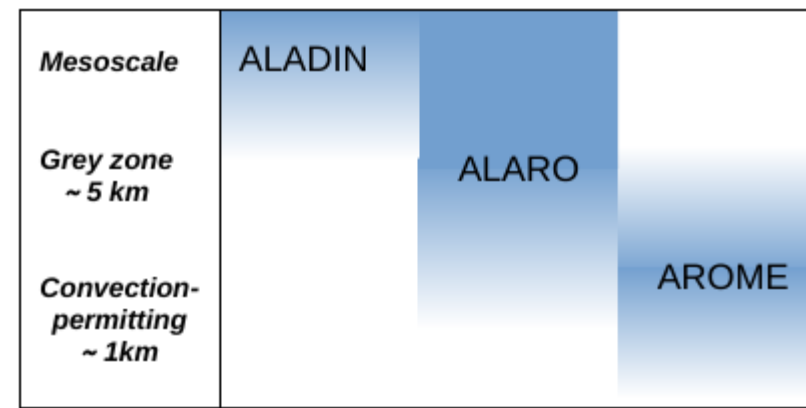- I propose to define *common activities* as the activities that lead to *common codes*.

The CMCs

Table 2. The AROME CMC

| parameterization/dynamics	scheme	references
dynamics	non-hydrostatic ALADIN	Bénard et al. (2010)
radiation	RRTMG_LW, SW6	Iacono et al. (2008), Mlawer, Morcrette (2001)
turbulence	CBR	Cuxart et al. (2000), Bougeault and Lacarrere (1989)
microphysics	ICE3	Pinty and Jabouille (1998)
shallow convection	PMMC09	Pergaud et al. (2009)
deep convection	–	
clouds		Bechtold et al. (1995); Pergaud et al. (2009)
sedimentation scheme		Bouteloup et al. (2011)
surface scheme	SURFEX	Masson et al. (2013)
LBC scheme	Davies scheme	Davies (1976), Radnóti (1995), Termonia et al. (2012)

Table 3. The ALARO CMC

parameterization/dynamics	scheme	references
dynamics for dx > 4km	hydrostatic ARPEGE/ALADIN	Temperton et al. (2001), Radnóti et al. (1995)
dynamics for dx < 4km	non-hydrostatic ALADIN	Bénard et al. (2010)
radiation	ACRANEB2	Mašek et al. (2016), Geleyn et al. (2017)
turbulence	TOUCANS	Durán et al. (2014), Marquet and Geleyn (2013)
microphysics	Lopez	Lopez (2002)
shallow convection	TOUCANS	Durán et al. (2014), Marquet and Geleyn (2013)
deep convection	3MT	Gerard et al. (2009)
sedimentation scheme		Geleyn et al. (2008)
orographic gravity wave drag		Catry et al. (2008)
surface scheme	ISBA	Noilhan and Planton (1989)
LBC scheme	Davies scheme	Davies (1976), Radnóti (1995), Termonia et al. (2012)

|	
dixit "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 "*From science to operations*" diagram. These are subject to **ToRs.**
dixit "Core programs"	commonly agreed program of recognised strategic importance that will benefit all partners
dixit "Specific activities"	all activities carried out outside of the core programs that, 1. are needed by a limited group of member states who invest resources in it. (this include initiatives by one single Member). **OR** 2. do not lead in the short term to the creation of a new CMC or a major extension of the sanity check **OR** 3. are not needed to guarantee operations

From science to operations
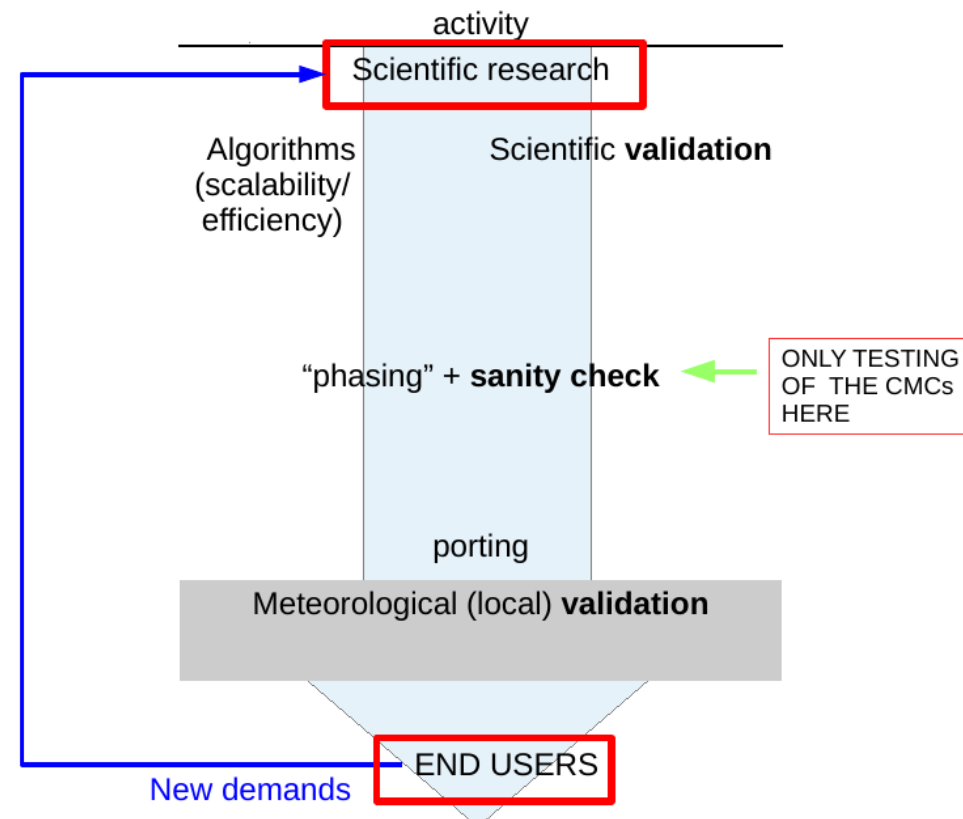
Overview status of porting the export version in ALADIN countries (*courtesy by M. Derkova, ACNA*)

countries		Oct2015	Apr2016	Oct2016
Algeria	ALADIN	no	ported	ported
Austria	ALARO / AROME	ported	e-suite	operational
Belgium	ALARO	ported	ported	e-suite
Bulgaria	ALADIN	ported	ported	e-suite CY41
Croatia	ALARO	no (but CY41)		
Czech R.	ALARO	not planned (HPC upgrade 2017)		
France	AROME	operational	operational	operational
Hungary	ALARO / AROME	no	ported	ported
Morocco	ALADIN / AROME	ported	ported	ported
Poland	ALARO / AROME	operational	operational	operational
Portugal	ALADIN / AROME	not planned (HPC upgrade 2017)		
Romania	ALARO	ported	operational	operational
Slovakia	ALARO	ported	ported	operational
Slovenia	ALARO	no	no	ported
Tunisia	ALADIN	no	ported	ported
Turkey	ALARO	ported	ported	operational
	AROME	not planned (HPC upgrade 2017)		
ported/operational		10/2	13/3	14/6

Core program on a DA basic kit

- Almost all countries have activities on DA, but a fair number don't have a 3Dvar in operations...

- 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.

  – Based on the inquiry outcomes propose & organize a flat-rate working days/week to discuss plans, define the work needed and discuss potential problems

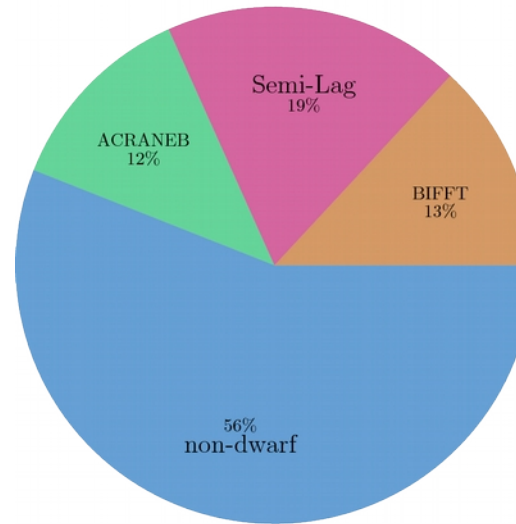 – A meeting was organized in Lisbon (22-23 March).
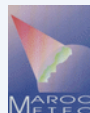
DA "*basic*" kit

- 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 was presented and discussed.

- Identification of data where a common action is possible, 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.

- A concrete action was kicked-off the make to start working on data handling.

- Data assimilation requires a different state of mind than downscaling. You have to maintain a data assimilation cycling process.

- 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?
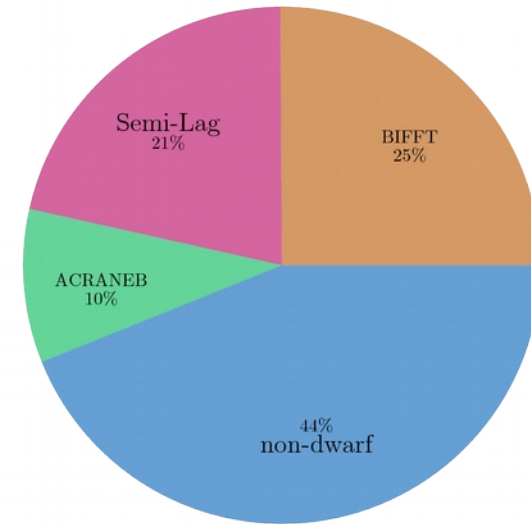
Dynamics

- **ESCAPE WP4**

  - Identify LAM Dwarfs in the ESCAPE project

  - Mid-Term Review planned in June.

  - Full 3D reference setups are running in ECMWF

  - LAM profiling has been done

    - Bi-FFT is the main Dwarf.

    - We are working on grid point solvers (plan to become more concrete after the CSSI/HMG meeting)
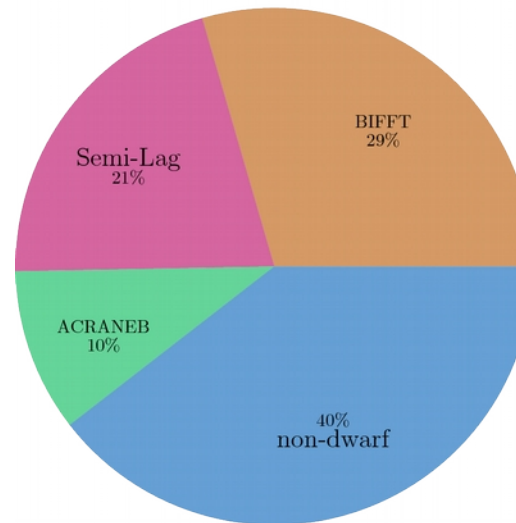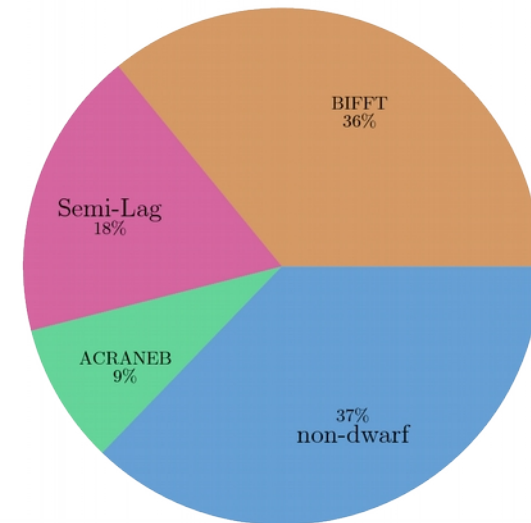
  - See talk Steven.

$N_{\mathrm{MPI}} = 1$

Semi-Lag 19%
ACRANEB 12%
BIFFT 13%
56% non-dwarf

$N_{\mathrm{MPI}} = 36$

Semi-Lag 21%
BIFFT 25%
ACRANEB 10%
44% non-dwarf

$N_{\mathrm{MPI}} = 144$

BIFFT 29%
Semi-Lag 21%
ACRANEB 10%
40% non-dwarf

$N_{\mathrm{MPI}} = 576$

BIFFT 36%
Semi-Lag 18%
ACRANEB 9%
37% non-dwarf

Validation of the ALARO-0 model within the EURO-CORDEX framework

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[1]Royal Meteorological Institute, Brussels, Belgium
[2]Centre of Excellence PLECO (Plant and Vegetation Ecology), Department of Biology, University of Antwerp, Wilrijk, Belgium
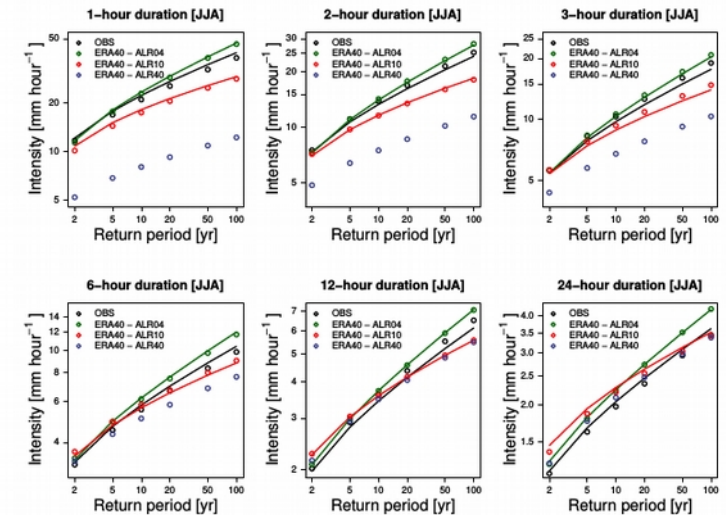[3]Department of Physics and Astronomy, Ghent University, Ghent, Belgium

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Precipitation

Figure 5. Scores for precipitation for all domains (first column), seasons (second column) and metrics.

IDF relationship based upon power law

Courtesy PhD R. De Troch

This model was configured from the ALADIN System but could be considered as a configuration of the ALADIN-HIRLAM System

Have a nice and fruitful meeting!