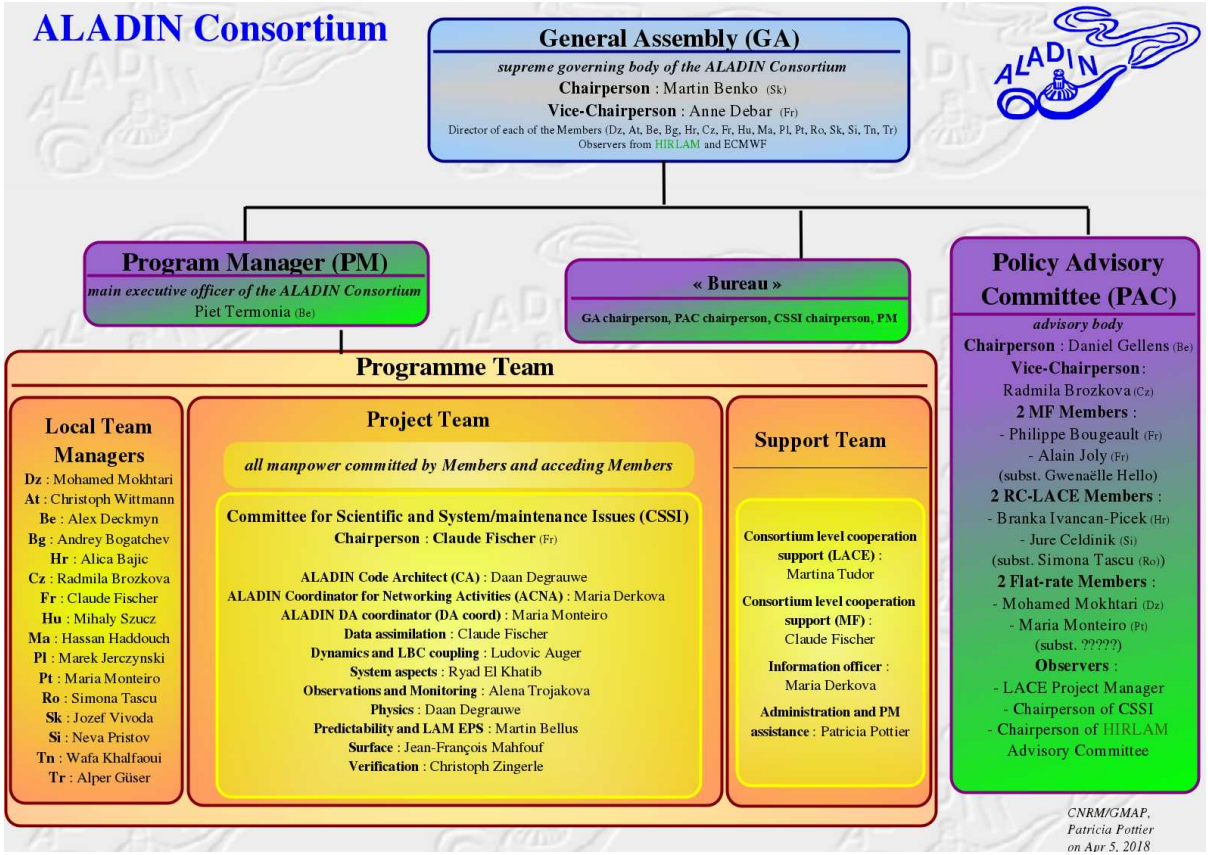
ALADIN status overview

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

EWGLAM meeting, 1 November, Salzburg, Austria, 2018

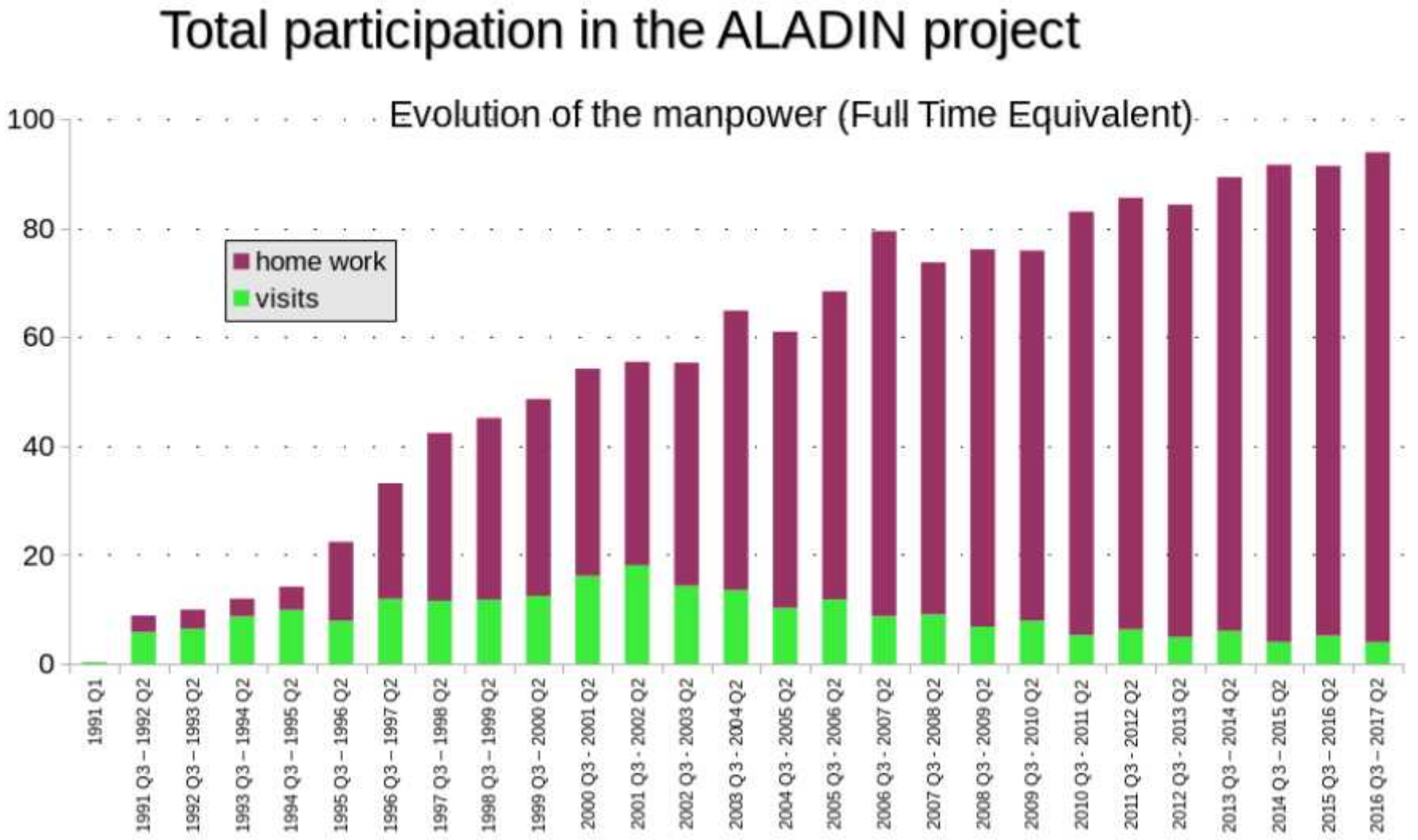
The Members of the consortium

Governance



- Changes:
  - New PAC chair: Daniel Gellens
  - New LACE PM: Martina Tudor
  - New ALADIN Data assimilation coordinator: maria Monteiro

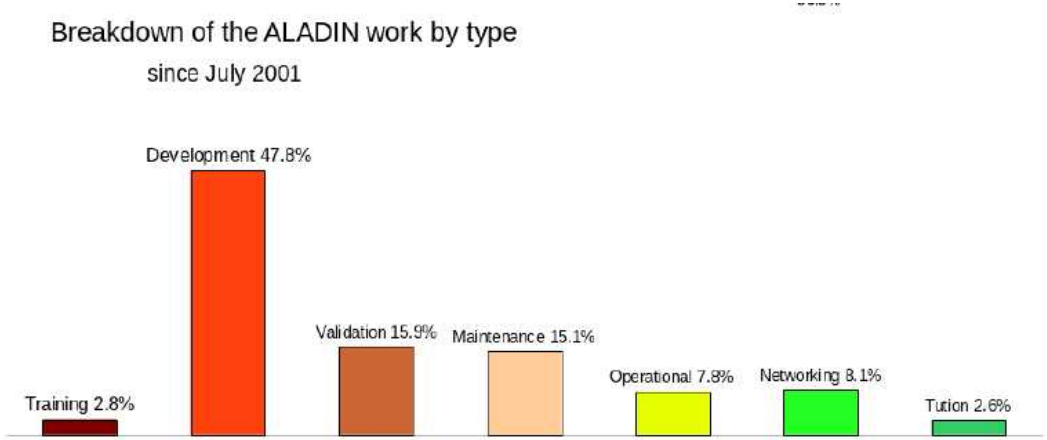
Man power

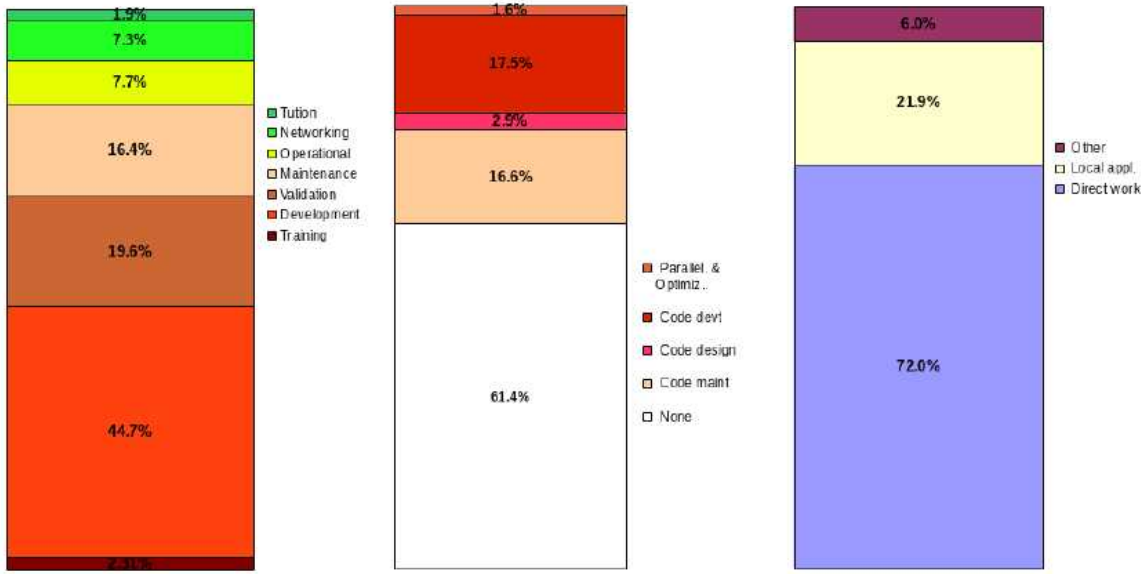


Yearly evolution of the manpower

Numbers Presented to the ALADIN GA, Nov 2017

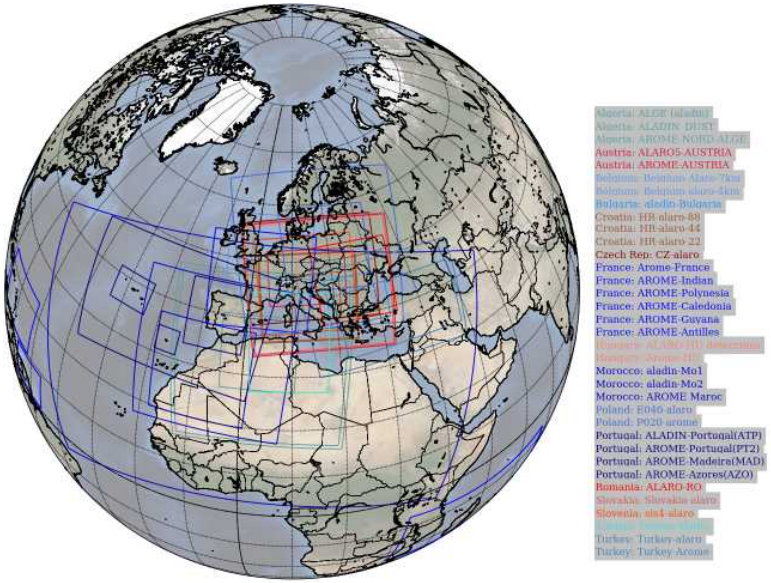
Types of ALADIN work





Numbers Presented to the ALADIN GA, Nov 2017

The operational ALADIN configurations of the ALADIN-HIRLAM System



Data of last year,will updated soon

Table 4. The current configurations of the ALADIN System running in the ALADIN partner countries, with their nationally-used name, horizontal resolution (HRES), domain size, number of vertical levels (NLEV), Version of the ALADIN System, coupling model and the used configuration (ALADIN, ALARO, AROME).

Partner	Oper. Model	HRES	Domain size	NLEV	Model version	Coupled with	Configuration
Algeria	ALADIN-ALGE	8.00	450x450	70	CY40T1	ARPEGE	ALADIN
Algeria	ALADIN-DUST	14.00	250x250	70	CY38T1	ARPEGE	ALADIN
Algeria	AROME-NORD-ALGE	3.00	500x500	41	CY40T1	ALADIN-ALGE	AROME
Austria	ALARO5-AUSTRIA	4.82	540x600	60	CY36T1	IFS	ALARO
Austria	AROME-AUSTRIA	2.50	432x600	90	CY40T1	IFS	AROME
Belgium	Belgium-Alaro-7km	6.97	240x240	46	CY38T1	ARPEGE	ALARO
Belgium	Belgium-alaro-4km	4.01	181x181	46	CY38T1	ARPEGE	ALARO
Bulgaria	aladin-Bulgaria	7.00	144x180	70	CY38T1	ARPEGE	ALADIN
Croatia	HR-alaro-88	8.00	216x240	37	CY38T1	IFS	ALARO
Croatia	HR-alaro-44	4.00	432x480	73	CY38T1	IFS	ALARO
Croatia	HR-alaro-22	2.00	450x450	37	CY36T1	HR-alaro-88	ALARO
Croatia	HR-alaro-HRDA	2.00	450x450	15	CY38T1	HR-alaro-88	ALARO
Czech Rep	CZ-alaro	4.71	432x540	87	CY38T1	ARPEGE	ALARO
France	Arome-France	1.30	1440x1536	90	CY41T1	ARPEGE	AROME
France	AROME-Indean Ocean	2.50	900x1600	90	CY41T1	IFS	AROME
France	AROME-Polynesia	2.50	600x600	90	CY41T1	IFS	AROME
France	AROME-Caledonia	2.50	600x600	90	CY41T1	IFS	AROME
France	AROME-Guyana	2.50	384x500	90	CY41T1	IFS	AROME
France	AROME-Caribbean	2.50	576x720	90	CY41T1	IFS	AROME
Hungary	ALARO-HU determinis	7.96	320x360	49	CY38T1	IFS	ALARO
Hungary	Arome-HU	2.50	320x500	60	CY38T1	IFS	AROME
Morocco	Aladin-NORAF	18.00	324x540	70	CY41T1	ARPEGE	ALADIN
Morocco	ALADIN Maroc	7.50	400x400	70	CY41T1	ARPEGE	ALADIN
Morocco	ALADIN Ma 3DVar	10.00	320X320	60	CY36T1	ARPEGE	AROME
Morocco	AROME Maroc	2.50	800x800	60	CY41T1	ALADIN Ma 3DVar	AROME
Poland	E040-alaro	4.00	800x800	60	CY40T1	ARPEGE	ALARO
Poland	P020-arome	2.04	810x810	60	CY40T1	E040-alaro	AROME
Portugal	ALADIN-Portugal(ATP)	9.00	288x450	46	CY38T1	ARPEGE	ALADIN
Portugal	AROME-Portugal(PT2)	2.50	540x480	46	CY38T1	ARPEGE	AROME
Portugal	AROME-Madeira(MAD)	2.50	200x192	46	CY38T1	ARPEGE	AROME
Portugal	AROME-Azores(AZO)	2.50	270x360	46	CY38T1	ARPEGE	AROME
Romania	ALARO-RO	6.50	240x240	60	CY40T1	ARPEGE	ALARO
Slovakia	Slovakia-alaro	4.50	576x625	63	CY36T1	ARPEGE	ALARO
Slovenia	sis4-alaro	4.40	432x432	87	CY38T1	IFS	ALARO
Tunisia	Tunisia-ALADIN	7.50	216x270	70	CY38T1	ARPEGE	ALADIN
Turkey	Turkey-alaro	4.50	450x720	60	CY38T1	ARPEGE	ALARO
Turkey	Turkey-Arome	2.50	512x1000	60	CY38T1	ARPEGE	AROME

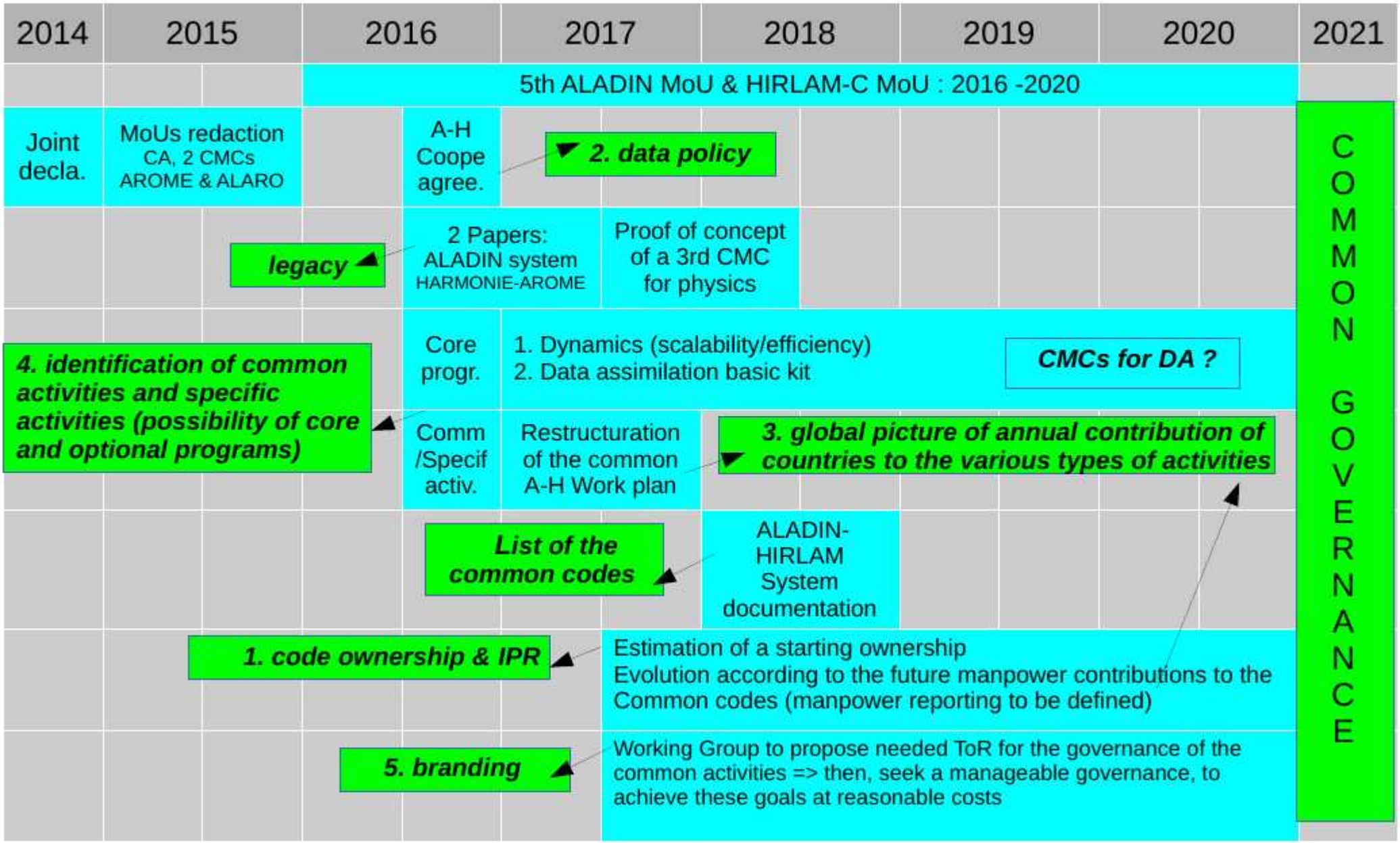
ACNA: ALADIN Coordination and Networking

	porting of CY43T2bf09 status Sept2018	
countries	answ	status+plans
Algeria	yes	ported (AROME, ALADIN), report sent, no scores yet
Austria	yes	not yet implemented, planned this autumn, oper in 2019
Belgium	yes	compiled, used for experiments and the e-suite (ALARO 1.3km); surface assim planned
Bulgaria	yes	not yet, planned for beginning of 2019
Croatia	yes	porting did not started yet, but it is planned
Czech R.	yes	operational, fixes and comments sent
France	-	exported
Hungary	yes	not yet, porting planned for 2019
Morocco	yes	compiled but not working yet (pbs in coupling), , investigations ongoing
Poland	yes	compiled, ALARO in pre-operation tests, AROME plan in near future
Portugal	yes	started (installation not finished yet), to be used with DA configurations
Romania	yes	not yet, planned for 2019 if new HPC is available
Slovakia	yes	ported, technical validations only (e001, e927)
Slovenia	yes	ported: e001 and e927 technically validated, DA just started
Tunisia	yes	not ported yet, planned till the end of 2018
Turkey	yes	not ported yet, planned for operational in early 2019
HIRLAM	yes	https://hirlam.org/trac/wiki/HarmonieSystemDocumentation/43h1.pre-alpha.1_validation

2	fully validated
7	installed/ported/compiled
6	not yet started but plan to do so

Courtesy Maria Derkova

ALADIN-HIRLM Convergence road map



Météo-Algérie
الديوان الوطني للأرصاد الجوية
Office National de la Météorologie
ZAMG
IRM
DHMZ
METEO FRANCE
OMSZ
MAROC METEO
IPMA
Instituto Português do Mar e da Atmosfera
METEO ROMANIA
SHMU
ARSO METEO Slovenia
METEOROLOJI

papers

Geosci. Model Dev., 11, 257–281, 2018
https://doi.org/10.5194/gmd-11-257-2018

Geoscientific Model Development
Open Access
EGU

The ALADIN System and its canonical model configurations AROME CY41T1 and ALARO CY40T1

Piet Termonia[1,2], Claude Fischer[3], Eric Bazile[3], François Bouyssel[3], Radmila Brožková[4], Pierre Bénard[3], Bogdan Bochenek[5], Daan Degrauwe[1,2], Mariá Derková[6], Ryad El Khatib[3], Rafiq Hamdi[1], Ján Mašek[4], Patricia Pottier[3], Neva Pristov[7], Yann Seity[3], Petra Smolíková[4], Oldřich Španiel[6], Martina Tudor[8], Yong Wang[9], Christoph Wittmann[9], and Alain Joly[3]

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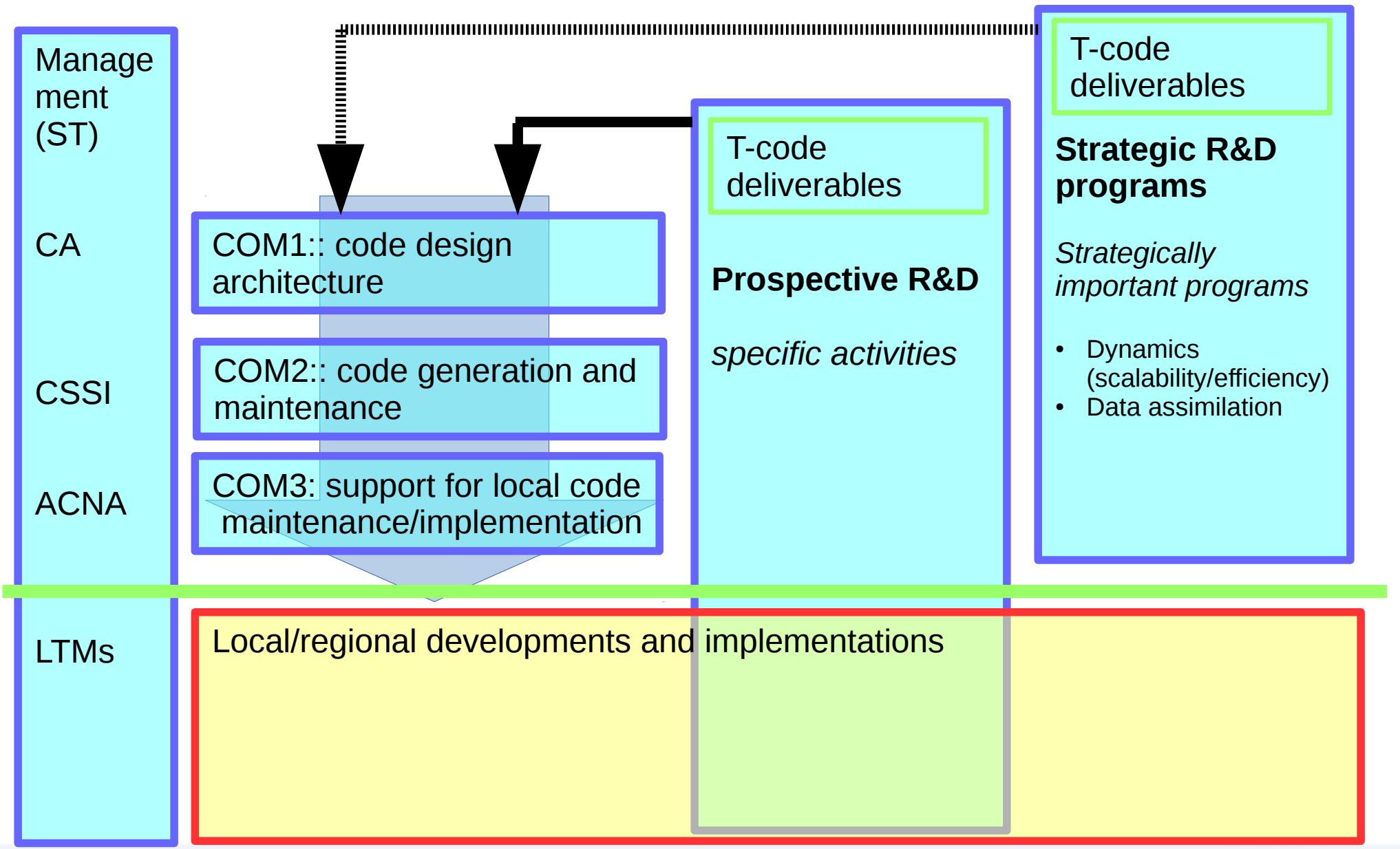
[2]Department of Physics and Astronomy, Ghent university, Ghent, Belgium
[3]CNRM/GMAP, Météo-France, Toulouse, France
[4]Czech Hydrometeorological Institute, Prague, Czech Republic
[5]Institute of Meteorology and Water Management – State Research Institute of Poland, Krakow, Poland
[6]Slovak Hydrometeorological Institute, Bratislava, Slovakia
[7]Slovenian Environment Agency, Ljubljana, Slovenia
[8]Meteorological and Hydrological Service, Zagreb, Croatia
[9]Zentralanstalt für Meteorologie und Geodynamik, Vienna, Austria

The HARMONIE–AROME Model Configuration in the ALADIN–HIRLAM NWP System

LISA BENGTSSON,[a] ULF ANDRAE,[a] TRYGVE ASPELIEN,[b] YURII BATRAK,[b] JAVIER CALVO,[c] WIM DE ROOY,[d] EMILY GLEESON,[e] BENT HANSEN-SASS,[f] MARIKEN HOMLEID,[b] MARIANO HORTAL,[g] KARL-IVAR IVARSSON,[a] GEERT LENDERINK,[d] SAMI NIEMELÄ,[h] KRISTIAN PAGH NIELSEN,[f] JEANETTE ONVLEE,[d] LAURA RONTU,[h] PATRICK SAMUELSSON,[a] DANIEL SANTOS MUÑOZ,[g] ALVARO SUBIAS,[g] SANDER TIJM,[d] VELLE TOLL,[i] XIAOHUA YANG,[f] AND MORTEN ØDEGAARD KØLTZOW[b]

[a] *Swedish Meteorological and Hydrological Institute, Norrköping, Sweden*
[b] *Norwegian Meteorological Institute, Oslo, Norway*
[c] *Agencia Estadal de Meteorologia, Madrid, Spain*
[d] *The Royal Netherlands Meteorological Institute, De Bilt, Netherlands*
[e] *Met Éireann, Dublin, Ireland*
[f] *Danish Meteorological Institute, Copenhagen, Denmark*
[g] *Agencia Estadal de Meteorologia, Madrid, Spain*
[h] *Finnish Meteorological Institute, Helsinki, Finland*
[i] *University of Tartu, Tartu, Estonia*

Structure of the 2018 ALADIN/HIRLAM/LACE rolling work plan



Dynamics Strategic R&D program

- ***Quasi-Elastic (QE) system***
- ***Development of methods for solving the implicit equation in gridpoint space.***
- Horizontally Explicit Vertically Implicit (HEVI) methods with ALADIN-NH core
- Physics-dynamics interface
- Development of LAM components in Atlas

LAM EPS component in ESCAPE

- The LAM aspects are included in WP4.
- Energy vs. wall-time profiling.
- Three Dwarves are studies (bi-FFT transform, ACRANEB, SL scheme) and have been profiled
- Preliminary results: Bi-FFT increases for wall-time, but decreases for energy (the energy of the communications not included in the test)

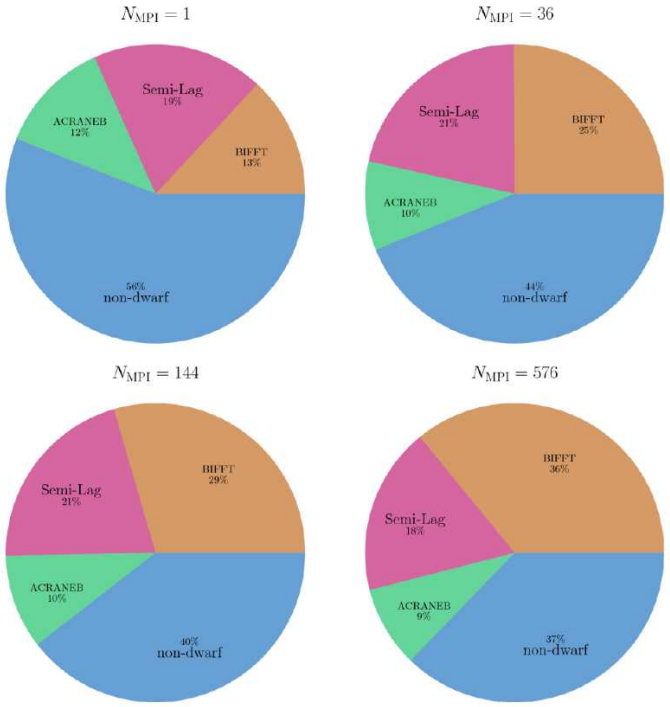


Figure 8: Distribution of the forecast runtime among dwarfs for the ALARO reference (2.5km).

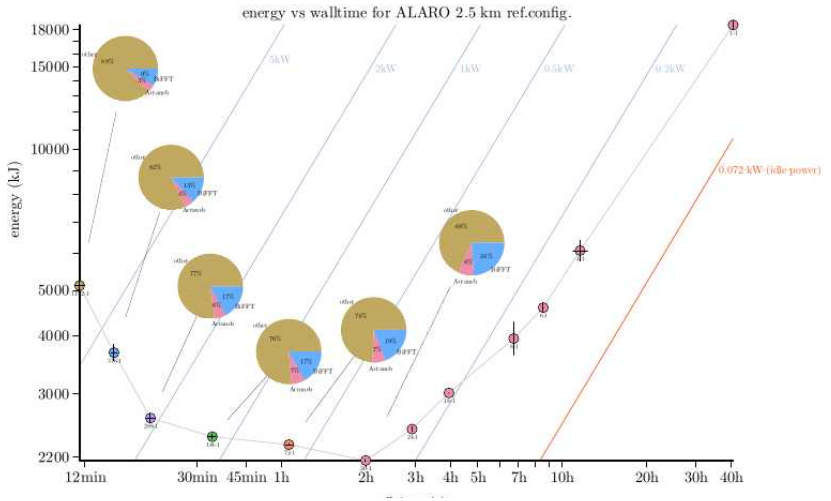


Figure 3: The energy consumption vs walltime for the ALARO 2.5 km reference configuration. Only pure MPI jobs were simulated. The colors and added lines have the same meaning as in Figure 2. The piecharts are estimates of the relative energy contributions of the BiFFT and Acraneb dwarfs for full-node runs.

Courtesy J. Van Bever

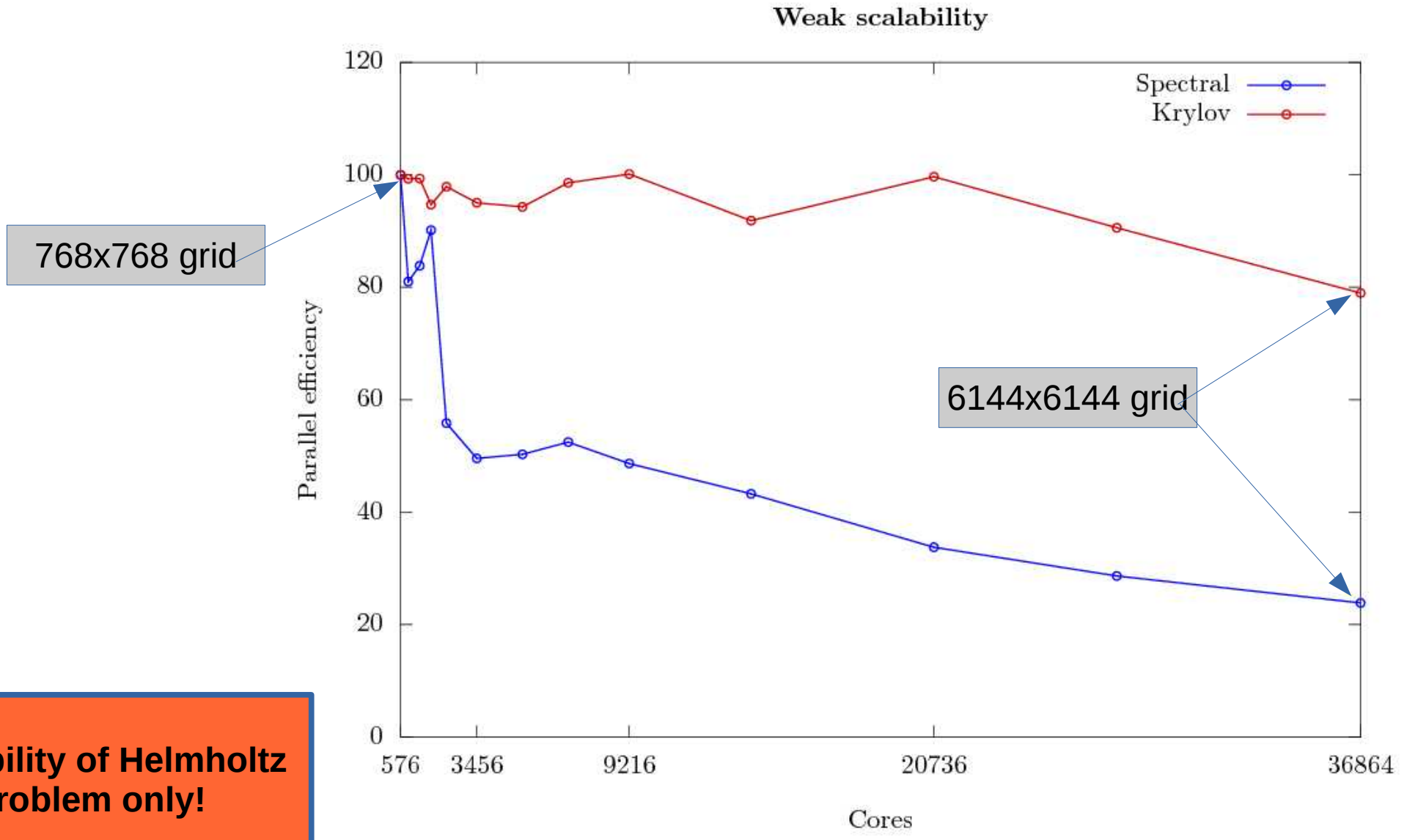
A non-spectral Helmholtz solver for ALADIN-NH

- Semi-implicit timestepping involves solving Helmholtz problem
- Existing spectral solver faces challenges w.r.t. scalability and steep slope stability.
- Development of a multigrid-preconditioned Krylov solver for ALADIN-NH set of equations

  (non-hydrostatic, mass-based, constant-coefficient)

A non-spectral Helmholtz solver for ALADIN-NH

Scalability tests on ECWMF Cray



Scalability of Helmholtz problem only!

DAsKIT strategic R&D program

- 2018 DasKIT WD partly join with LACE DAWD, Romania, 19-21 Sept 2018
- Focus on surface DA cycling with WMO BUFR SYNOP (testbed with AROME-PT2, CY40T1)
- Experience using ALADIN-HIRLAM DA monitoring & verification tools
- Follow up: local implementation

Planning and reporting

- The joint ALADIN-HIRLAM RWP2018 has been approved by the ALADIN General Assembly and the HIRLAM Council and is now being carried out.
- We are, together, with our HIRLAM colleagues, implementing a reporting system for the ALADIN-HIRLAM community
- We already validated data for the first quarter of 2018.
- Next steps: compare the reported (executed) manpower to the commitments in the RWP2018
- We are updating the RWP (it is a rolling plan) to create a 2019 version.

Prospective R&D

- I focus here on the other countries: Algeria, Belgium, Bulgaria, Morocco, Portugal, Poland, Tunesia and Turkey, see the ALADIN-HIRLAM Newsletter for details.
- DA, see presentations, A Bocenek (LACE) and C. Loo (MF)
  - At IPMA (Portugal): (a) 3D-Var has been implemented on the actual operational HPC platform of IPMA, (b) sensitivity tests for for the assimilation of ocean wind data from ASCAT-coastal data in the HARMONIE-AROME configuration
  - At INM (Tunesia) a 3DVAR data assimilation configuration is being implemented on the local machine. INM (Tunesia) is currently testing and EDA based on a 3Dvar with a 3-h cycling and Synop, Temp, Amdar, Buoy and Satellite data (Seviri, AMSU-A, AMSU-B, IASI)
  - The Moroccan Meteorologial Service (DMN): (a) improve QPE from moroccan radar (Khribga) by using rain gauge measurements., (b) evaluation of ten permanent ground-based GPS stations w.r.t radiosondes
  - MGM (Turkey) has been evaluating the impact of SEVIRI radiance and conventional observations on forecast. Several thinings are tested w.r.t to conventional data.
- Physics, see presentations of N. Pristov (LACE) and Y. Seity (MF).
  - Luc Gerard homogeneized the cloudiness estimates as to make the coherent across the microphyics and the deep convection scheme CSD (see task PH3.5).
  - The research code for graupel treatment that was prepared in cy38 has been phased into cy43t2 and cy45. For scientific validation the code is planned to be phased in a research branch of CY43T2 (not an export version, but available later on request).
  - ALARO is technically working with SURFEX(v8).
- EPS: Martin Bellus (LACE) and Claude Fischer (MF)
- Dynamics: see presentation of P. Smolikova.
- Surface: see presentation on ALADIN surface activities R. Hamdi (PT) during this workshop
- HARP, see presentation of C. Zingerle

Scope of the AH collaboration

- *to reflect on the scope of the future single consortium (what the 26 NMSs want to do together);*
- *to develop a vision consistent with the "2016 - 2025 Strategy of the European National Meteorological and Hydrological Services: Towards a network of European NMHSs: collaboration & complementarity", adopted in May 2016 by many ALADIN-HIRLAM NMSs;*
- *to propose options for the governance of the single consortium, inspired from the governance of other international cooperation such as EUMETNET, EUMETSAT, ECMWF, ECOMET;*
- *to edit a kind of "dictionary" to make sure the same words are used with the same meaning among 26 ALADIN-HIRLAM NMSs currently belonging to different consortia with different practices and culture.*

Thank you for your attention