

Rolling plan Reporting and priorities

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ECMWF,

2 December 2014



Reporting

- Cy38 ported to the countries, see talk by Claude Fischer
- New baseline for ALARO-1 created
- Orienting the work on dynamical cores toward the ECMWF scalability program`
- First OOPS prototype created of 3Dvar in Meteo France.
- A Forecasters meeting was organized this year:
 - It was a success, to be repeated next year
 - Conclusion: forecasters need guidance to interpret the high resolution
- Some countries became active in European funding.
- Scientific innovations:
 - Improved AROME version for fog
 - VFE
 - Evidence that A grid may actually be better than C grid
 - ...



Priorities

- Physics-dynamics action: treat turbulence
- Intensify work on scalability cfr. Link with ECMWF
- SURFEX ... to be planned, but investments can really start to pay off.
- Could we validate a cycle together with HIRLAM?
- A strategy meeting in 2015-2016? The ALADIN strategy document ends in 2017:
 - Canonical systems for data assimilation?
 - Increase the resolution (1 km and beyond).



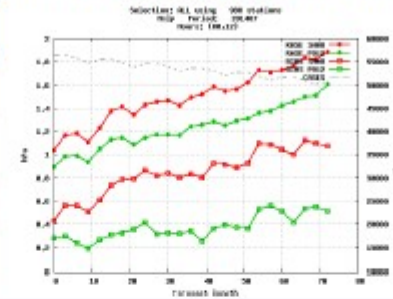
Slovakia

Operational activities



High-resolution e-suite based on CY38T1bf03_export running since 01/07/2014 in full assimilation/production mode

OPER	E-suite
9x9km & 37 levels	4.5x4.5km & 63 levels
envelope orography & quadratic grid	mean orography & linear grid
CY36T1	CY38T1.bf03_export
CANARI + DFI blending & Arpege boundaries a'3h	



R&D



Dynamics

J. Vivoda: Vertical Finite Elements

Data Assimilation

M. Nestiak: Radar quality control & data assimilation

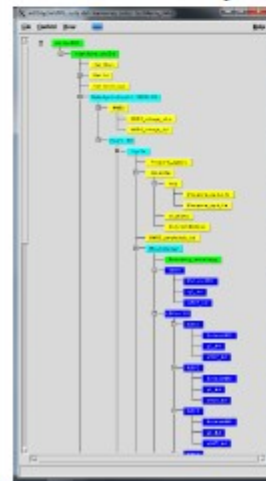
EPS/LAEF

M. Bellus: Experiments with the size of the ensemble & Stochastically perturbed physics tendencies

Collaboration



HARMONIE system Working Week, 13-17/10/2014 Bratislava

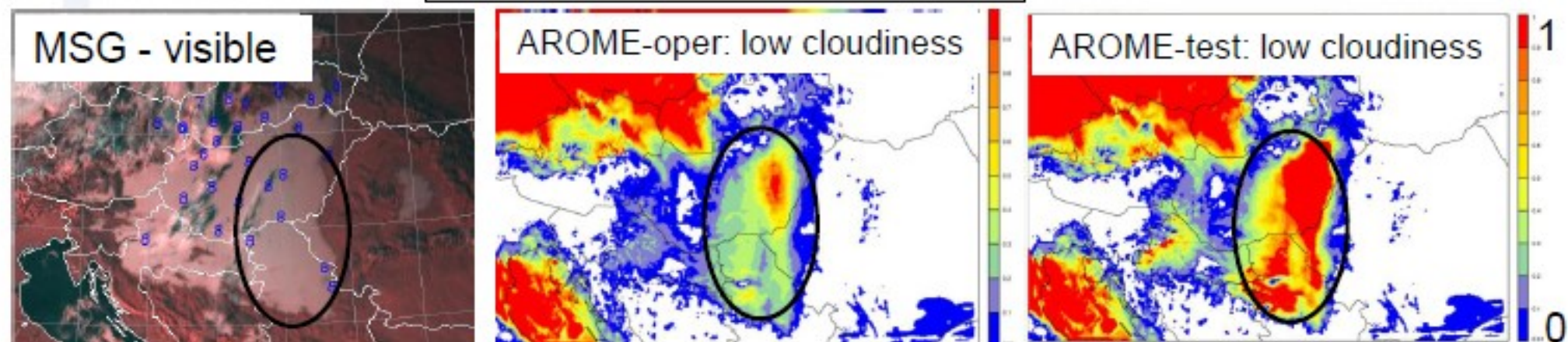




Activities at the Hungarian Meteorological Service

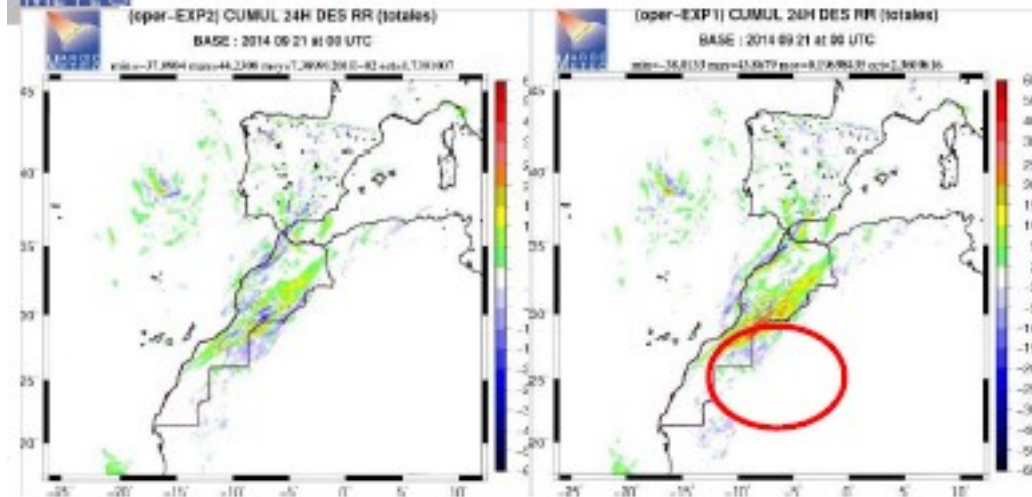
- Wintertime stratus cases: low cloudiness is underestimated by AROME (and other operational models) → French—Hungarian Bilateral Project (2 years)
- These cases are often associated with light drizzle in AROME
- Above freezing point: liquid drizzle in AROME is close to measurements and other models
- Below freezing point: amount of solid drizzle is higher than in observations or other models → investigation of microphysics (snow processes)
- By increasing the critical value for autoconversion (cloud ice to snow) → snowfall decreases → stratus does not dissolve in AROME

2011-11-30 14 UTC (+14h forecasts)



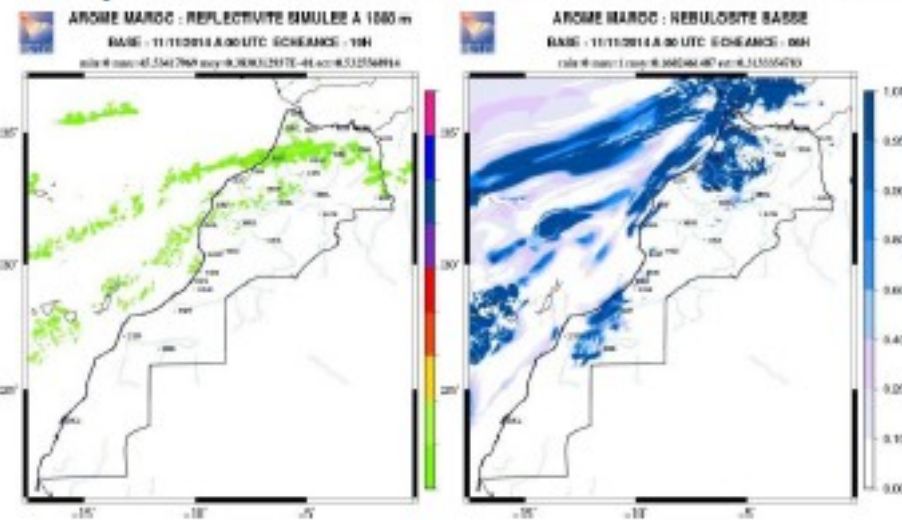
- Modification tested on selected case studies and longer periods (summer and winter)
- Double suite currently running at the Hungarian Met Service

cy38t1bf03 with SURFEX in ALADIN-MAROC

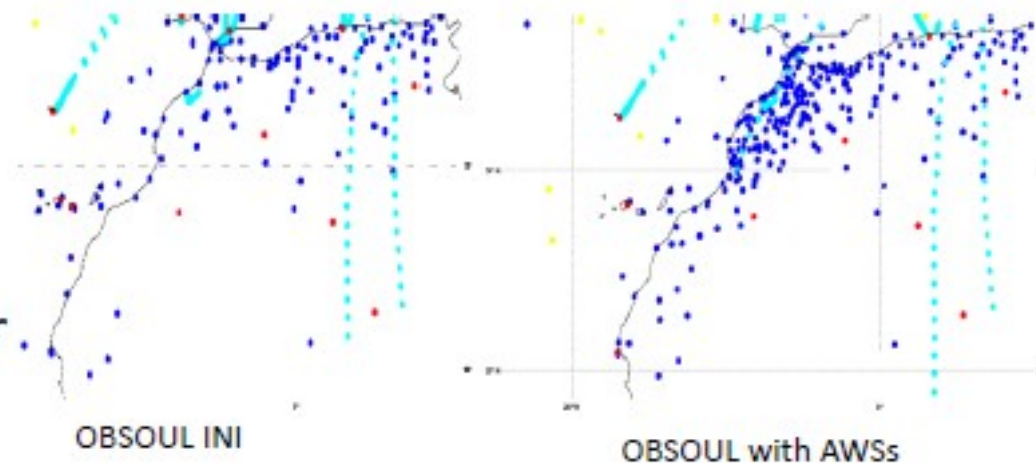


- ❑ ALADIN-MAROC, NORAF, AROME models are used in the forecasting practice. The cycle 38t1bf03 with surfex in ALADIN-MAROC was implemented locally at the Moroccan Meteorological Service (DMN) on an IBM HPC cluster.
- ❑ The execution time has been reduced by passing to cy38t1bf03 cycle which shows that the code parallelizing is improved than in cy36t1
- ❑ It appeared during the operation of the new cycle for three months, that there was a problem of underestimation of rainfall. With the help of our colleagues in the GMAP team of Météo-France, the problem was solved

Implementation of AROME-MAROC 2.5 km Over Morocco



- ❑ AROME-MAROC model with the cycle 38t1bf03 was implemented locally at the Moroccan Meteorological Service (DMN) on an IBM HPC cluster.
- ❑ The AROME ultra-short range forecasting model is executed on the IBM machine two times a day (at 00, 12 UTC network times) providing 36h forecasts, respectively



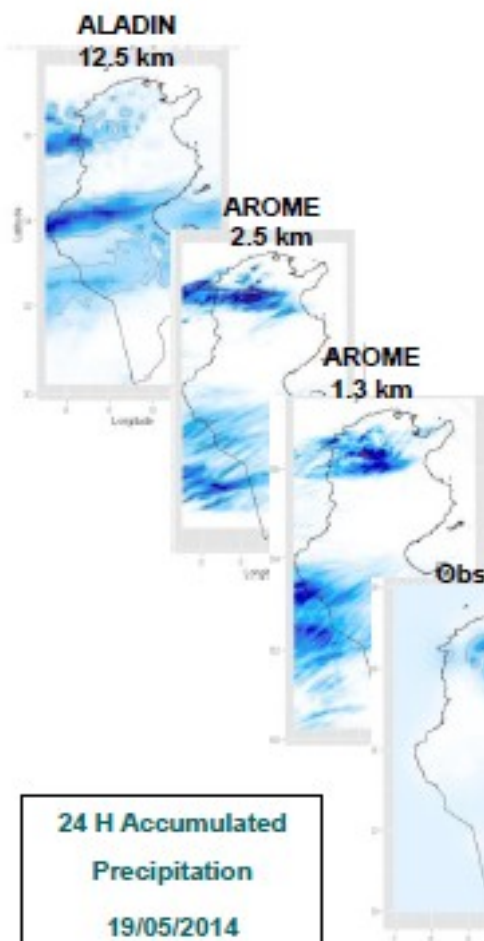
Integration of AWSs data in 3Dvar assimilation in ALADIN-MAROC



Configuration of AROME-Tunisia prototype 1.3Km resolution (CY38t1, Coupled to ARPEGE 10Km, Time step 45s, 90 vertical levels)

Developing a new Numerical Weather Forecast Verification System

Environnement	Scripts Shell / R / Fortran
Tools	<ul style="list-style-type: none"> explorative methods numerical descriptive measures Categorical verification scores Spatial Verification Method



AROME 2.5 km 24 hour accumulated precipitation contingency table at 10 mm threshold on 19/05/2014

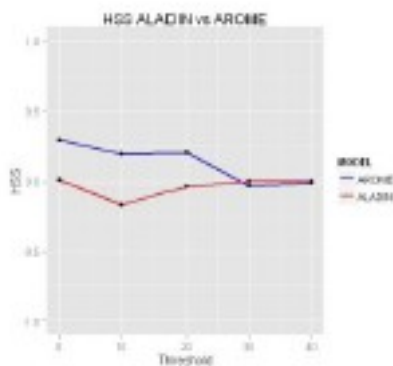
		Observation		Marginal Total
		Yes	No	
Forecast	Yes	7	11	18
	No	17	85	102
Marginal Total		24	96	Sample = 120

ALADIN 12.5 km 24 hour accumulated precipitation contingency table at 10 mm threshold on 19/05/2014

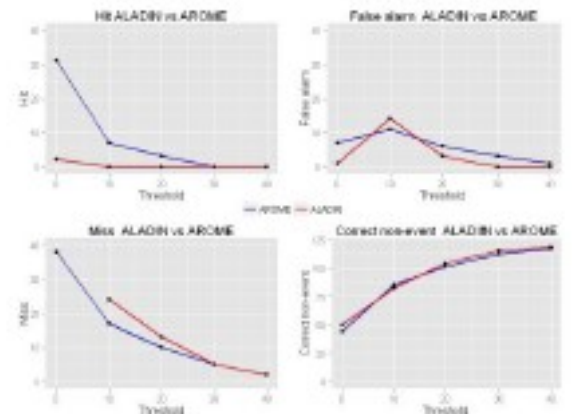
		Observation		Marginal Total
		Yes	No	
Forecast	Yes	0	14	14
	No	24	82	106
Marginal Total		24	96	Sample = 120

AROME 2.5 km and ALADIN 12.5 km categorical verification scores for the 24H accumulated precipitation at 10 mm threshold on 19/05/2014

	AROME	ALADIN
POD	0.291	0
FAR	0.611	1
BIAS (Frequency)	0.75	0.583
CSI	0.2	0
ETS	0.108	-0.079
HSS	0.195	-0.172
FA	0.114	0.145
KSS	0.177	-0.145
EOS	0.132	-1



Comparison between AROME 2.5 km and ALADIN 12.5 km 24 H Accumulated Precipitation 19/05/2014



24 H Accumulated Precipitation 19/05/2014

Recent HIRLAM originating “demands”: examples

- ACRANEB2 (done) [ACRANEB is the radiation scheme used in ALADIN and still used in ALARO, it has been further developed mostly by J. Mašek into a new version, ACRANEB2]
- RACMO input [KNMI developments on turbulence]
- aerosols; cfr. workshop in Toulouse last year.
- new options for LBC v/s code overhaul of the existing LBC solution (eg. for OOPS)



An unofficial strongly needed activity: *code architecture*

- Last year in Reykjavik there was a question: *what model are we running?* AROME, ALARO ...
- This led to a dedicated action.
- First “deliverable”: ACRANEB2 is phased to the AROME configuration (as requested by HMG last year in Reykjavik) by Jan Masek. The exercise for radiation is relatively easy compared to the “moist” part, BUT the “methodology” (stepwise approach, follow-up meetings with webconfs, meeting in Toulouse, care of cycles) works so far. Next step: turbulence
- Evolve towards a “WRF-ish” **HARMONIE Forecast System (HFS)?**
- This is also a **scientific testbed!**

Synthetic time table:

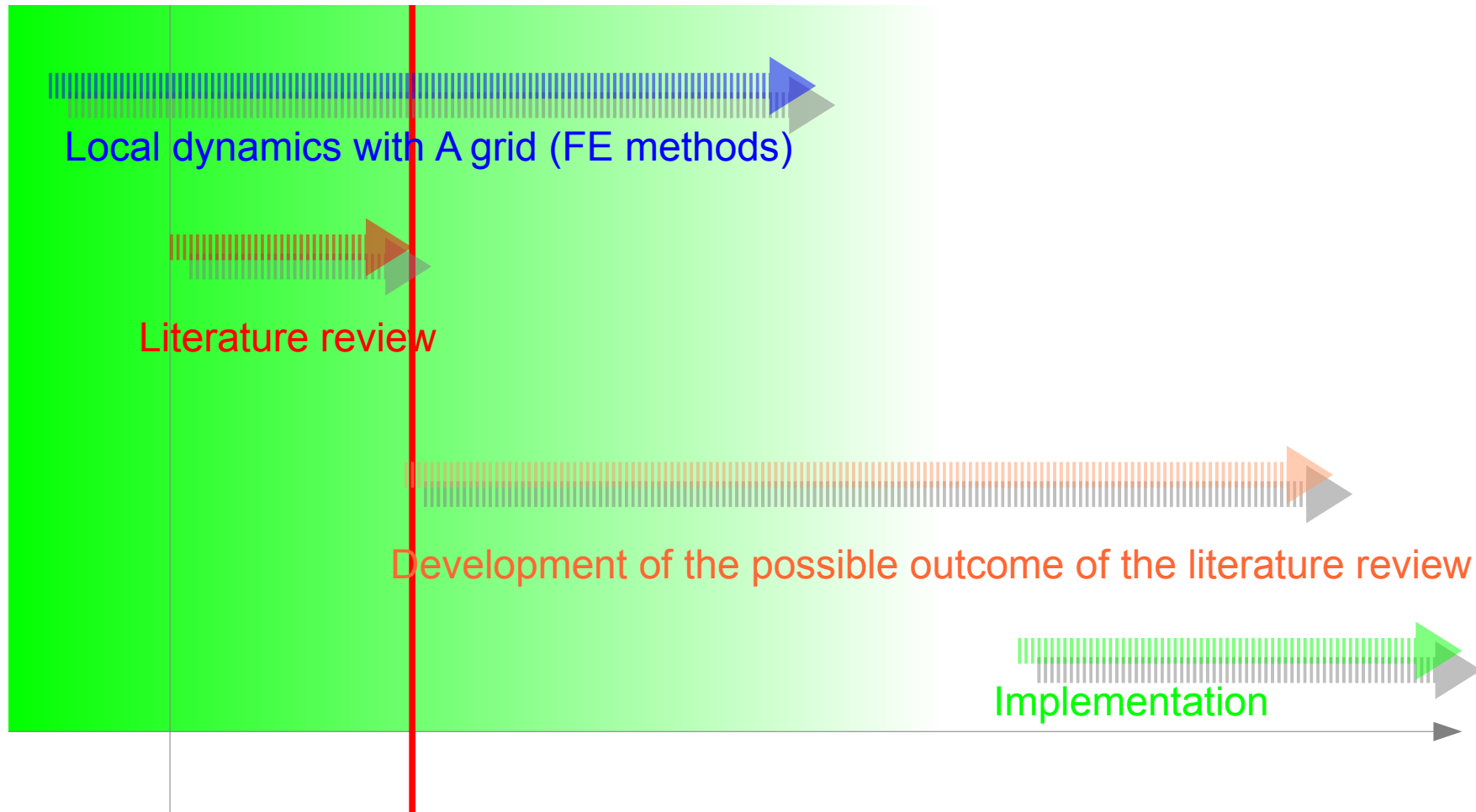
	Calendar (months/meetings)											
	2013						2014					
	5-6	WW Brussels (24-28/6)	7-9	CSSI/HMG (video)meeting	10-11	General Assembly (14-15/11)	12	1-4	ALADIN workshop/ASM	4-5	PAC/HAC	
Action 1: CPTEND_FLEX	█	█										
Action 2: r vs. q, T vs. theta	█	█	█									
Discuss analysis of action 2				█								
Action 3: Cleaning of APLPAR	█	█	█	█	█	█	█					
Action 4: Redesign of APL_AROME, APLPAR								█	█	█		
Report progress to GA about action 1 to 3.						█						
ALADIN WS/HIRLAM ASM : present analysis of action 4								█	█			
PAC/HAC : provide advice on the scenario's of action 4											█	



Dynamics: road map, after the 2011 strategy meeting

Eliminating the A grid means we have to overhaul the whole system.

We stay with the current system at least for the term of the current strategy plan (green area).



2012

2014

2017-2020

2025

