



Minutes

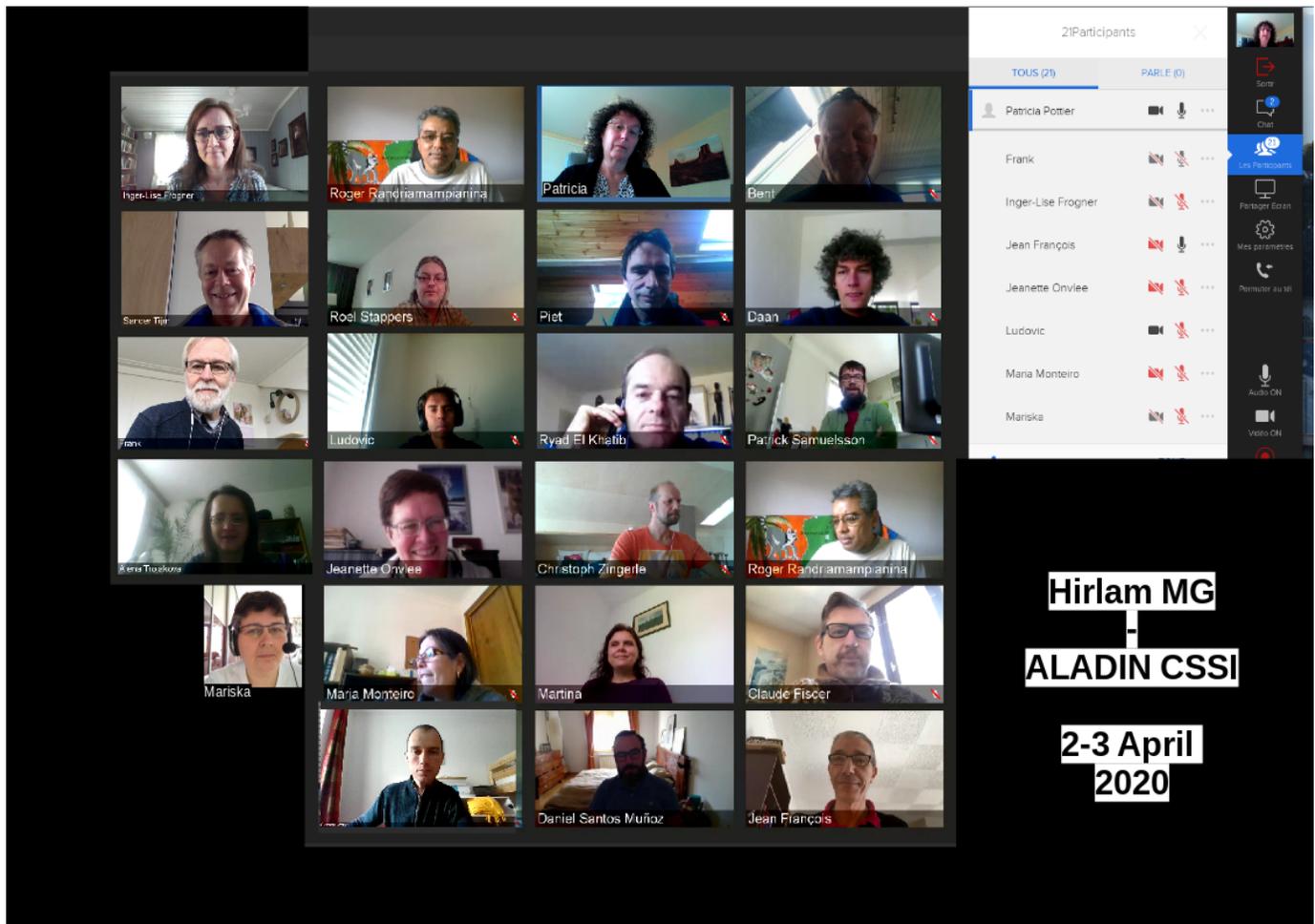
CSSI-HMG meeting 2019

2 April 2020 13:00 – 3 April 2020 15:30
visio-conference

List of (remote) participants :

Ludovic Auger, Daan Degrauwe, Maria Derkova, Ryad El-Khatib, Claude Fischer, Inger-Lise Frogner, Bent Hansen Sass, Frank Lantsheer, Jean-François Mahfouf, Maria Monteiro, Jeanette Onvlee, Patricia Pottier, Roger Randriamampianina, Patrick Samuelsson, Daniel Santos, Roel Stappers, Piet Termonia, Sander Tijn, Alena Trojakova, Martina Tudor, Clemens Wastl, Christoph Zingerle

Petra Smolikova (LACE AL joined for discussion on dynamics).



HirLam MG
ALADIN CSSI
2-3 April
2020

1 Opening and adoption of the agenda

Claude opens the meeting and welcomes the remote participants. He proposes to go through each topic, first checking the status of what was done in 2019 and beginning of 2020 and focussing in issues if any; then discussing the same topic for 2021, adapting it to the outcomes of the strategy meeting.

The agenda is adopted without modifications.

2 Debriefing and status of the RWP2019

Prior to the meeting, the HMG/CSSI members have filled the status of each task in the Work Packages sheets of the RWP2019 and Patricia has added some provisional manpower statistics (the registered actions have still to be checked by the PMs for the 2nd quarter of 2019). The summary table is assessed during the meeting.

The summary report on the status of the RWP2019 is given in Annex II (and is available on the page dedicated to the RWP on the aladin website).

3 Expected /planned evolution of cycles

The description of the evolution of the cycles (timing and content) was detailed during the system plenary session of the Workshop (see Claude's presentation) or the usual "Progress and plans" document produced for the LTM meeting. The HMG/CSSI participants have no comment, thus it was not further discussed during the HMG-CSSI meeting.

4 Preparations for the RWP2021

The list and contents of the Work Packages for RWP2021 are agreed on and a list of actions is defined (see Annex I). The time-line to assess the RWP2020 and to prepare the RWP2021 is also adopted.

The HMG-CSSI discuss and agree on some changes in the preparation/utilisation of the RWPs:

- once the RWP is validated by the GA-C, no changes can be accepted;
- a RWP-augmented will be opened for comments all other the year (as soon as the RWP is validated) and will be the base for the status of this RWP at the next HMG-CSSI meeting;
- in the RWP, only redactors should be given possibility to write in their Work Package(s);
- the HoR and LTMs will have only the right to comment the RWP (including to add their commitments)
- Patricia will make the RWP2020-augmented (as soon as possible), prepare the RWP2021 google environment (by the end of April 2020) and distribute instructions to lead authors.

ROLLING WORK RWP2021
Timeline for the redaction of the 2021 RWP (backwards) as adopted on April 3, 2020

15 March 2021	Summary of execution of RWP2020 by PMs ready
January 2021	Execution of the RWP2020 : HMG/CSSI fill the additional columns (final status) in the augmented RWP2020
2 November 2020	Submission of RWP2021 to HC/GA (25-26/11/2020)
25 October 2020	finalization of commitments by ALADIN LTMs and HIRLAM HoR (comments)
25 October 2020	Move of the unstaffed tasks to the "needed unstaffed tasks table", preparation of a clean pdf version
5 October 2020	Submission of RWP2021 to HAC/PAC (21-22/10/2020)
23 September 2020	estimated commitments by ALADIN LTMs to the redactors (comments)
23 September 2020	estimated commitments by Hirlam HoR to the redactors (comments)
end of August	Plan text ready, not yet with pm numbers
until beg of August	2nd redaction and check of the draft RWP by PMs
17 June 2020	Invitation for the HIRLAM staff and ALADIN LTM (roles, responsibilities, timeline) to check if there is nothing missing that is in their local scientific plans
until mid-June 2020	1st redaction : beg May to mid-June
4 May 2020	Make RWP2021 google environment ready and distribute instructions to lead authors:
4 May 2020	HMG-CSSI: appoint all lead authors and finalization list of 2021 WP's
26 April 2020	Request for commitment to other lead authors
12 April 2020	Request for commitment to lead authors of unchanged WPs
12 April 2020	creation of augmented RWP2020

The HMG-CSSI propose to show this timeline to HAC-PAC, to make them aware of these deadlines that are not always compatible with the NMSs deadlines (for establishment of the work plan and manpower commitments).

5 A.O.B.

The content and the frequency of the joint ALADIN-HIRLAM Newsletters is discussed and HMG-CSSI agree to :

- call for contributions to the summer 2020 NL, based on contribution to the visio Wk/ASM (in the current unusual context some proposals for articles have already been received);
- call for contributions based on national and group activities (cooperation topics);
- Patricia will try to prepare a template for Googledocs ;
- rise the question during the closing session of the ASW next year : do we need a summer NL dedicated to the ASW (as the presentations & posters are on-line, the video of the presentations too).

6 Closing and next year meeting

The next meeting will take place next year in Ljubljana on Thursday afternoon and Friday morning after the All Staff Workshop (dates t.b.d.).

Annex I : Preparation for RWP2021 [date: as of 8 April 2020, after wrap-up with the 3 PMs + CSSI chair]

Actions and priorities defined during the HMG/CSSI meeting, on April 2-3 2020

WP NAME		MAIN EDITOR(S)	Priorities	TODO list
MNGT1	Management and ALADIN support activities	Piet Termonia and Patricia Pottier	same as 2020, awaiting the discussion for a single consortium	Piet: adapt to single consortium when decision to merge approved
MNGT2	Management LACE	Martina Tudor	same as 2020	
MNGT3	Management HIRLAM	Jeanette Onvlee	same as 2020	
COM1.1	ALADIN Code architect coordination activities	Piet Termonia and Daan Degrauwe		Piet: ToR of CA and COM1.1 content to be discussed and adapted to the management of the single consortium
COM1.2	HIRLAM Code analyst activities	Jeanette Onvlee & Roel Stappers		Jeanette: ToR of CA and COM1.2 content to be discussed and adapted to the management of the single consortium.
COM2	Code generation and maintenance	Claude Fischer	include tasks here to focus on the goals to achieve a more distributed, portable, efficient and continuous process of code generation	Claude, Alexandre, Daniel, Olda: define the tasks for evolution of common working methods & environment (cycling)
COM3.1	Maintenance and Partners' implementations of ALADIN system	Maria Derkova	keep in 2021	<i>PMs, Claude, Patricia: to check reported 2019 manpower on local maintenance & implementation (done) . If needed, provide recommendations to LTMs</i>
COM3.2	Support for maintenance and implementation of Harmonie system on local machines	Daniel Santos	keep in 2021	

	WP NAME	MAIN EDITOR(S)	Priorities	TODO list
COM3.3	Training (preparation, lectures, attendance)	Jeanette Onvlee, Piet Termonia, Martina Tudor, Claude Fischer	lots of good ideas: davaï, Olive etc. / organize by remote participation ? / set timing of training sessions well in advance / assess feasibility and assign to appropriate WP	For all HMG-CSSI members: move the trainings from R&D WPs to this COM3.3
COM3.4	Attendance and preparation of ASW & EWGLAM	Jeanette Onvlee, Piet Termonia, Martina Tudor, Claude Fischer	The scientific exchanges during Working Days or Working Weeks belong to the scientific workpackage; the COM3.4 is only for joint WK/ASM and EWGLAM	<i>added by PMs+Claude during wrap-up meeting; already available for registration in 2020</i>
SPTR1	Effort on separation of concern: adapting the codes to new architectures; analyze the approach used in IFS; assess various strategies (ATLAS, CLAW, DSL etc.); documentation and training; phasing of specific codes with ECMWF.	Piet Termonia ?	System Area Leader and staff from DYN, PHYS, Surface and System will be involved into the staffing of this WP. We leave the optimisations for the current codes (where separation of concerns is not yet implemented/ active) in the System WPs. Everything linked to ECMWF and separation of concerns refactoring moves here.	Piet to liaise with Alain Joly & Daniel Santos for the redaction process. Piet will write the first draft
DY2	FVM-like solution as an alternative to SISL dynamical core	Ludovic Auger, Sander Tijm	SPDY1 reformulated for 2021 => becomes DY2	new ident in the DB
DY3	Development of methods for solving the implicit equation in gridpoint space.	Ludovic Auger, Sander Tijm	SPDY2 => becomes DY3	new ident in the DB
SPDY3	Horizontally Explicit-Vertically Implicit (HEVI) methods with ALADIN-NH core	Ludovic Auger, Sander Tijm	remove from the RWP	
SPDY4	Physics-dynamics-interface	Daan Degrauwe, Sander Tijm	moved to PH9	
SPDY5	Development of LAM-components in Atlas	Daan Degrauwe, Sander Tijm	remove, as would be included in SPTR1	
SPDA1	Basic data assimilation-setup	Piet Termonia, Maria Monteiro, Alena Trojakova	move to DA (DA8)	Piet: inquiry with all DAsKIT countries whether to prolongate the project in 2021 (and beyond)

	WP NAME	MAIN EDITOR(S)	Priorities	TODO list
DA1	Further development of 3D-Var (alg. Settings)	Roger Randriamampianina, Benedikt Strajnar, Claude Fischer		
DA2	Development of flow-dependent algorithms	Roger Randriamampianina and Claude Fischer	at present, several algorithms are being described (4D-Var, LETKF, EnVar à la OOPS) => adapt to strategy meeting outcome (i.e. prioritize effort towards pre-oper level of maturity rather than exploration of new algos)	JFM & Roger: add a task on the link with SU1 for the long term goal of a coupled UA/surface analysis
DA3	Use of existing observations	Roger Randriamampianina, Jean-François Mahfouf	ensure OBS developments follow a high level of interoperability; encourage cross-CSC collaboration	
DA4	Use of new observations types	Jean-François Mahfouf and Roger Randriamampianina	add a task here related to investigating the use of machine learning techniques for obs QC for new (ground-based high-density) data types?	1/ Roger, Jean-François, Claude: coordinate new obs types between us and with ECMWF; 2/ Roger & JFM: identify contact persons, then arrange a meeting to discuss priority on ML for QC
DA5	Development of assimilation setups suited for nowcasting	Xiaohua Yang, Pierre Brousseau, Florian Meier		
DA6	Participation in OOPS	Claude Fischer, Roel Stappers, Daan Degrauwe		Claude & Roel arrange visit to MF to work on OOPS-LAM; explore what can be done remotely
DA7	Observation pre-processing and diagnostic tools	Eoin Whelan, Alena Trojaková		Frank G. & Eoin W. & Alena T.: exchange on bator+ecCodes solution.
DA8	Basic data assimilation setup	Basic data assimilation setup		Former SPDA1 moved to DA8. Piet: inquiry with all DAsKIT countries whether to prolongate the project in 2021 (and beyond)

WP NAME		MAIN EDITOR(S)	Priorities	TODO list
DY1	Improvement of SISL spectral dynamical core (H and NH)	Petra Smolikova & Sander Tijm	detailed tasks may evolve from year to year pending on results from other dyn WPs or operational feedback	keep DY1 for tasks in DY1+DY2+DY3+DY4 RWP2020 but different ident in the DB
DY2	Time-stepping algorithm	Petra Smoliková		
DY3	Vertical discretization	Petra Smoliková		
DY4	Semi-Lagrangian advection	Petra Smoliková		
PH1	Developments of AROME-France (and ARPEGE) physics	Claude Fischer and Yves Bouteloup		
PH2	Developments of HARMONIE-AROME physics	Sander Tijm		
PH3	Developments of ALARO physics	Neva Pristov		
PH4	Common 1D MUSC framework for parametrization validation	Sander Tijm, Wim de Rooij and Eric Bazile		
PH5	Model Output Postprocessing Parameters	Maria Derkova		1/ Mariska & Sander: update the inquiry on plans for developing model output diagnostics in all teams. 2/ Mariska, Martina & Sander: to explore possibility to organize a webconf in 2020.
PH6	study the radiation/cloud/aerosols interactions	Jan Masek & Laura Rontu	if no writer defined, move to RWP-2022 ?	Jeanette will check with Laura and Martina with Jan
PH7	develop approaches for 3D physics	?	note: at present, this is a task in HR1 (for turbulence)	Sander, Claude, Martina, Piet: better describe the scope and content of this WP, then identify a redactor. Martina: check for SLHD type of solution. Sandor/Bent: radiation aspects and Claude to contact Ryad/Rachel
PH8	assess the use of ML for physics parametrizations	DMI ?		Bent: contact DMI persons (Escape-2 related)

WP NAME		MAIN EDITOR(S)	Priorities	TODO list
PH9	make the inventory of scientific & technical blocking points for convergence of the CSC physics & physics/dynamics interface	Daan Degrauwe & Martina Tudor	add a task on the validity range of physics parametrization	parts of former SPDY4 could be put in PH9 and should be adapted to PH9
PH10	development of fully stochastic physics parametrization	?	for 2021: make a preparatory work i.e. a scientific inventory (bibliography, list issues, propose a road map). Include surface aspects (processes, parameters) into this preliminary study.	1/ to the 3 PMs: to find a person volunteering to write the RWP sheet & trigger the preparatory work. 2/ JFM: check with Camille for joining the discussion. Claude will contact a few persons in GMAP, Piet will contact Michiel
SU1	Algorithms for surface assimilation	Rafiq Hamdi and Patrick Samuelsson	Long term goal: work on the task definition on the investigation towards a new surface assimilation code => spatialization using ensembles, ability to use satellite data, coupling with UA/DA, include discussion with ECMWF	Patrick Samuelsson & JFM, Roger, Daniel, Camille: discuss assimilation codes with ECMWF (organized by Steve English) & provide feedback to HMG-CSSI.
SU2	Use of observations in surface assimilation	Stefan Schneider and Patrick Samuelsson		
SU3	SURFEX: validation of existing options for NWP	Patrick Samuelsson, Samuel Viana and Jan Masek		
SU4	SURFEX: development of model components	Patrick Samuelsson		
SU5	Assess/improve quality of surface characterization	Ekaterina Kourzeneva, Patrick Samuelsson and Rafiq Hamdi		
SU6	Coupling with sea surface/ocean	Neva Pristov and Patrick Samuelsson		Claude & Patricia: check with Sylvie for adding the work done at LACY as a new task in the SU6 WP.
E1	Arome-France EPS (PEARO)	Claude Fischer	there should be a task about the work on physically-based perturbations (like SPPT, SPP)	

WP NAME		MAIN EDITOR(S)	Priorities	TODO list
E2.1	Development of convection-permitting ensembles: HarmonEPS - Physics perturbations	Inger-Lise Frogner	there should be a task about the work on physically-based perturbations (like SPPT, SPP)	
E2.2	Development of convection-permitting ensembles: HarmonEPS - Initial conditions perturbations	Inger-Lise Frogner		
E2.3	Development of convection-permitting ensembles: HarmonEPS - Surface perturbations	Inger-Lise Frogner		
E2.4	Development of convection-permitting ensembles: HarmonEPS - Lateral boundary perturbations	Inger-Lise Frogner		
E2.5	Development of convection-permitting ensembles: HarmonEPS - HarmonEPS system	Inger-Lise Frogner		
E3	Development, maintenance and operation of convection-permitting ensembles for LACE	Clemens Wastl	there should be a task about the work on physically-based perturbations (like SPPT, SPP)	
E4	Development, maintenance and operation of LAEF	Clemens Wastl		
E6	Ensemble calibration	Inger-Lise Frogner		
E7	Develop user-oriented approaches	RMI ?	keep in mind the need for developing flexible and interoperable tools. Ensure link with Eumetnet/PP program.	Piet, Claude, Clemens, Bent: exchange further on defining the scope & content of the WP, then find one or two names for leading it. First, Piet & Claude : start to write objectives from M. Plu's text. Stade2: contact Clemens, Bent and Matthieu to check and complement the content. Stade3: find a redactor

WP NAME		MAIN EDITOR(S)	Priorities	TODO list
MQA1	Development of HARP	Christoph Zingerle	include in QA1 tasks for the consulting process, and the study of HARP's ability to handle large data amounts.	Bent to organize web-meeting on needs and next developments for HARP.
MQA2	Development of new verification methods	Bent Hansen Sass, Christoph Zingerle, Joël Stein, Claude Fischer	issues with staffing specific tasks, will have to find new staff or prioritize	
MQA3	Meteorological quality assessment of new cycles and alleviation of model weaknesses	Bent Hansen Sass, Joël Stein, Claude Fischer		
SY1	Code optimization	Daniel Santos, Ryad El Khatib		
SY2	Maintenance and development of the Harmonie Reference System	Daniel Santos		
SY3	Revision of the Harmonie scripting system	Daniel Santos		
SY4	Towards a more common working environment: explore what could be elements of common working environment; assess potential of Vortex as basis for future common scripting system	Daniel Santos, Olda Spaniel, Claude Fischer, Alexandre Mary, Alex Deckmyn	Exploratory phase: mirror repositories; ticketing; web-forums; documentation to be explored (link with COM2). Don't forget training !	PMs + Daniel + Claude: define a working group for SY4. Scope of WG would be both collaborative tools and scripting. meetings of the WG to set feasible tasks for 2021 from the strategy, focusing on scripting first - leaving repository discussions in COM2); platform for information exchange. Prop. WG: Daniel Santos, Olda Spaniel, Claude Fischer, Alexandre Mary, Alex Deckmyn, Ulf Andrae, Roel Stappers, Piet Termonia. Piet to contact Alexandre + Daniel: prepare the 1st web-conference
HR1	(Sub)-km modelling	Sander Tijn, Martina Tudor, Claude Fischer	Move 3D aspects for physics to PH7. Very high resolution DA activity to be reported in this WP. Add one task about exploring the use of crowd-	Sander to involve Patrick S. / Martina to involve Rafiq / Claude to involve a GMME staff (Olivier ?)

			sourced data for validation.	
--	--	--	------------------------------	--

The 3PMs and CSSI chair will explore how to organize the interaction between our NWP group and other modelling group(s) eg. HCLIM, reanalysis, urban modelling, wave & ocean modelling
The priorities should be indicated in the introduction text of the RWP.

Annex II : Summary status of the RWP2019 [date: as of 17 April 2020]

This version is the same as the version prepared during HMG-CSSI, besides the reported manpower for 2019 in the different work packages (consolidated manpower numbers after checking by PMs and Claude).

Status on April 17, 2020

WP NUMBER	WP NAME	MAIN EDITOR(S)	STATUS	comments	Manpower in RWP2019 (approved GA-C Dec 2018)	Reported manpower
-----------	---------	----------------	--------	----------	--	-------------------

ROLLING WORK PLAN 2019 : CHAPTER 1

Management	MGMT1	Management and ALADIN support activities	Piet Termonia and Patricia Pottier			54	42.75
	MGMT2	Management LACE	Martina Tudor	On track		23.5	25
	MGMT3	Management HIRLAM	Jeanette Onvlee	On track		22.5	14.5
Common	COM1.1	ALADIN Code architect coordination activities	Piet Termonia and Daan Degrauwe	On track	Work also reported in other WPs	5	4.25
	COM1.2	HIRLAM Code analyst activities	Jeanette Onvlee & Roel Stappers	On track		5	6
	COM2	Code generation and maintenance	Claude Fischer	On track	see Claude presentation during Wk/ASM	109	110.75
	COM3.1	Maintenance and Partners' implementations of ALADIN system	Maria Derkova	On track		174	129.5
	COM3.2	Support for maintenance and implementation of Harmonie system on local machines	Daniel Santos	On track		3	6
	COM3.3	Training (preparation, lectures, attendance)	Jeanette Onvlee, Piet Termonia, Martina Tudor, Claude Fischer		not in RWP2019 plans but was added in the registration tool		18.75

ROLLING WORK PLAN 2019 : CHAPTER 2 : STRATEGIC (CORE) PROGRAMS

Dynamics and scalability	SPDY1	Quasi-Elastic (QE) system	Ludovic Auger, Sander Tijm	Delayed or issues	Work on QE has been stopped after prioritisation with respect to other SPDY topics. The QE system coded in AROME was not fully stable yet.	6	1
	SPDY2	Development of methods for solving the implicit equation in gridpoint space.	Ludovic Auger, Sander Tijm	On track	Scalability tests of the GP solver dwarf have shown convincing results. First runs were performed in AROME 3D and show good performance compared to the spectral method.	30.5	28.75
	SPDY3	Horizontally Explicit Vertically Implicit (HEVI) methods with ALADIN-NH core	Ludovic Auger, Sander Tijm	Completed	The work on HEVI was finished with the achievements of the PhD by C. Colavolpe. We believe that we have reference formulations for LAM as a back-up solution to our other research tracks (GP-SI, FVM-style).	6	1.5
	SPDY4	Physics-dynamics interface	Daan Degrauwe, Sander Tijm		Not so much activity	2.5	5.5
	SPDY5	Development of LAM components in Atlas	Daan Degrauwe, Sander Tijm	Delayed or issues	Several LAM features were developed, but still need to be phased into the main Atlas repository. This was planned for the Atlas Hackaton, which got postponed to later in 2020.	1	

Basic data assimilation setup	SPDA1	Basic data assimilation setup	Piet Termonia, Maria Monteiro, Roger Randriamampianina	On track	The progress for data acquisition is variable due to local specificities, but progresses. For data processing the adoption of OPLACE helps a lot, for other steps are made towards SAPP. All countries have implemented BATOR. The countries rely on MANDALAY for the observation monitoring. All countries were able to run a cycle. Belgium will use DaskIT operationally. Some countries make progress on 3Dvar.	36	35.25

ROLLING WORK PLAN 2019 : CHAPTER 3 : PROSPECTIVE R&D ACTIVITIES

Data Assimilation	DA1	Further development of 3D-Var (alg. Settings)	Roger Randriamampianina, Antonin Bucanek, Claude Fischer	On track	Training (preparation, lectures, attendance)	36.5	34
	DA2	Development of flow-dependent algorithms	Roger Randriamampianina and Claude Fischer	On track	4D-Var progress largely as planned. Hybrid EnVar system tested with Brand and LETKF perturbations. Some extensions made to LETKF scheme and tested. The OOPS-based EnVar prototypes have been further developed (an original solution for parallelization of 4D-EnVar is published) and upgraded from CY43 up to CY46. Experimentation of the LAM 3D-EnVar in AROME provides positive results compared with 3D-Var. Encouraging results obtained with 4D-EnVar in AROME (1h time window, full observation set of operational AROME-France).	68.25	65
	DA3	Use of existing observations	Roger Randriamampianina, Jean-François Mahfouf	On track	Assimilation of radar, ADD, GNSS ZTD carried out in RT or under testing with both 3- and 4D-Var in various places. Increased sharing and improved QC of Mode-S data, experimentation with VarBC. Supermodding implemented for scatterometer. Progress in optimization of clear-sky radiances, assimilation of near-surface obs, and use of BUFR radiosonde data (also descent).	119.25	101.5
	DA4	Use of new observations types	Jean-François Mahfouf and Roger Randriamampianina	On track	All-sky radiances assimilation implemented and published by MF. Promising results with assimilation of slant delays, crowd-sourced data, Aeolus, and AMDAR humidity profiles. Cloud initialization based on NWC-SAF data being prepared for operations.	75.75	89.5
	DA5	Development of assimilation setups suited for nowcasting	Xiaohua Yang, Pierre Brousseau, Florian Meier	On track	Activities focusing on reducing spinup/imbances in first few hours.	43	37.5
	DA6	Participation in OOPS	Claude Fischer, Roel Stappers, Daan Degrauwe	On track	OOPS Units Tests have been generalized and consolidated with CY46T1. For the global geometries, the tests are now part of the MF T-cycles. For LAM, work is in good progress to deliver stable unit tests with CY46T1_bf.03, and then forward phasing to CY47T1 and CY48. OOPS unit tests at MF encompass testing of all observation operators (direct, TL, AD), minimizations, model forecasts. At the end of 2019, the necessary C++ and Fortran for OOPS testing with Arpège or Arome configurations only is available in the MF repository (not yet fully phased with ECMWF).	26.5	17.25
	DA7	Observation pre-processing and diagnostic tools	Eoin Whelan, Alena Trojaková, Roger Randriamampianina	On track	Progress in more common preprocessing approaches and interfaces (Bator, ODB). New version of Obsmon, continuous exploration of other diagnostic tools. Local SAPP implementations increasing. OPLACE observation extensions.	19.5	26

Dynamics	DY1	Boundary conditions and nesting	Sander Tijm	On track	An update was created of gl. Some experiments were done with coupling of hydrometeors.	4	1.75
	DY2	Time-stepping algorithm	Petra Smolíková	On track	Iterations on demand and the reformulation of vertical motion have been ported to CY46	5	3.5
	DY3	Vertical discretization	Petra Smolíková	On track	VFE in NH with direct inversion Helmholtz solver is completed. The externalization of the vertical discretization has not start.	1	1
	DY4	Semi-Lagrangian advection	Petra Smolíková	On track	report available on the LACE web pages; problems with convergence were not confirmed; simple increase in the number of iterations brings already good results	4	3.5
Physics parametrizations	PH1	Developments of AROME-France (and ARPEGE) physics	Claude Fischer and Yves Bouteloup	On track	Sensitivity studies in AROME with respect to choices in the SL advection scheme (SLHD etc.). Design work on 2D+1D approach in the code (for 3D turbulence). Improvements in the microphysics scheme. For ARPEGE, work on switching to the new IFS radiation code (ECRAD), to the IFS convection scheme (Tiedtke-Bechtold). Testing of GELATO in ARPEGE has started.	85.75	47
	PH2	Developments of HARMONIE-AROME physics	Sander Tijm	On track	Improvements in low clouds, deep convection initiation, shallow open cell convection representation. Thompson microphysics studies completed and published. LIMA and ECRAD work not yet started, waiting for Cy46 implementation. Progress on aerosol studies. SBL studies ongoing, to be continued.	28	26.5
	PH3	Developments of ALARO physics	Neva Pristov	Delayed or issues	Progress was made on ALARO with SURFEX. In particular, the coupling was stableized and the exchange of the specifics of the surface (roughness, heat coefficient) was homogeneized between the surface and the upper air. The other topics progress steadily. Except the work on CSD and non-saturated downdraft due to illness. For this reason we put "issues".	51.5	36.75
	PH4	Common 1D MUSC framework for parametrization validation	Sander Tijm, Wim de Rooij and Eric Bazile	On track	New MUSC version, updated to Cy43, easy to install and run.	7	12
	PH5	Model Output Postprocessing Parameters	Maria Derkova	On track	Significant ongoing work but not coordinated.	1	20.25
	SU1	Algorithms for surface assimilation	Rafiq Hamdi	On track	Work on soil DA is on track.	38.25	28.5
Surface analysis and modelling	SU2	Use of observations in surface assimilation	Stefan Schneider	On track	Examination and intercomparison of different satellite snow, soil moisture, sea ice, Cryoland and HSAF products and amateur weather station data in surface assimilation. In MF, snow analysis has become operational in CANARI/AROME.	34	42.5
	SU3	SURFEX: validation of existing options for NWP	Patrick Samuelsson and Samuel Viana	On track	Bias assessment of Cy43h in climate mode completed, but approach too costly to be continued, work on parameter optimization for new schemes continuing in NWP mode. Exploration of TEB options continuing. Assess the impact of GELATO in ARPEGE+SURFEX (MF).	61	47.5
	SU4	SURFEX: development of model components	Patrick Samuelsson	On track	Work on glacier model continuing slowly. SICE: ice drift has been included. OROTUR implemented in Cy43. ORORAD is not implemented in CY43H2 because it is not in Surfex v8.1.	11.25	10.25
	SU5	Assess/improve quality of surface characterization	Ekaterina Kourzeneva	On track	ECOCLIMAP v2.2 versus SG intercomparison done, published in NL14. Corrections made in ECOCLIMAP (incl tree height), Soilgrids, and GLDB mainly for Nordic countries.	14.75	22.75
	SU6	Coupling with sea surface/ocean	Neva Pristov, Patrick Samuelsson	On track	Steady progress is reported. Code is being prepared.	14	8.75

Ensemble forecasting and predictability	E1	Arome-France EPS (PEARO)	Claude Fischer	On track	Increase of PEARO ensemble size from 12 to 16 members in July 2019. Preparatory work for increasing the horizontal resolution of the members from 2.5km to 1.3km. Sensitivity analysis w/r to 21 model parameters, and first evaluation of SPP with static perturbations. A new method for joining PEARO, PEARP and ECMWF EPS in time has been developed, and its use for agronomical applications has been demonstrated. A method for the objective discrimination of the texture of rain patterns (continuous/intermittent) in PEARO outputs has been developed.	62	97
	E2.1	Development of convection-permitting ensembles: HarmonEPS - Physics perturbations	Inger-Lise Frogner	Delayed or issues	SPP work progressed well. SPPT gives too small impact relative to other perturbation types in Cy43, under extensive investigation.	21.5	19
	E2.2	Development of convection-permitting ensembles: HarmonEPS - Initial conditions perturbations	Inger-Lise Frogner	On track	EDA work on track.	13.5	6.5
	E2.3	Development of convection-permitting ensembles: HarmonEPS - Surface perturbations	Inger-Lise Frogner	Delayed or issues	Surface field perturbation work on track. Surface physics perturbations work started in 2020.	9.25	8
	E2.4	Development of convection-permitting ensembles: HarmonEPS - Lateral boundary perturbations	Inger-Lise Frogner	Delayed or issues	Delayed, higher priority given to other issues	2	2.5
	E2.5	Development of convection-permitting ensembles: HarmonEPS - HarmonEPS system	Inger-Lise Frogner	On track	Technical work on SPP perturbations and tendencies as diagnostics on track.	4	2.5
	E3	Development of convection-permitting ensembles: LACE	Clemens Wastl	Delayed or issues	C-LAEF was operationalized in November 2019 on the ECMWF HPC. AROME-EPS is pre-operational in Hungary since May 2019 and fully operational since February 2020. Manpower is lacking for developments on (stochastic) perturbation methods and time lagged methods.	20	21
	E4	Development, maintenance and operation of LAEF	Clemens Wastl	Delayed or issues	Maintenance and implementation of the existing systems is OK. Some new developments have delay due to man power issues, new HPC installations.	13.25	10.75
	E5	Production and maintenance of GLAMEPS	Inger-Lise Frogner	Completed	GLAMEPS stopped in July 2019	0.25	
	E6	Ensemble calibration	Inger-Lise Frogner	On track	Investigation on machine learning approaches.	6	3.5
Quality assurance and verification	QA1	Development of HARP	Christoph Zingerle	On track	HARP user workshop and training in DMI 15-17 October 2019, documentation to be continued. Next version of HARP planned for end-2020 / beg-2021.	5.5	8
	QA2	Development of new verification methods	Bent Hansen Sass, Christoph Zingerle	Delayed or issues	New metrics under study, e.g. SLX. First versions of spatial probabilistic verification developed. Developments on score cards and on postprocessing methods to communicate HIW information from ensemble forecasts to duty forecasters. Work on simulated radiances delayed due to incapacitation of Angeles.	13.25	17
	QA3	Quality assessment of new HARMONIE-AROME cycles and alleviation of model weaknesses	Bent Hansen Sass	On track	Performance monitoring for Harmonie RCR's, regular reporting and assessment of Cy43 and of actions to alleviate known model problems. Test cases for fog and convection established, process studies done on low clouds and convection. Surface radiation verification started, studies on impact of cloud initialization and 4D-Var on model spinup ongoing..	19.75	21.5

	QA4	Verification and quality control at MF : development of new methods or products	Joël Stein, Claude Fischer	On track	Assess the use of ML approaches for verification. Develop new verification tools for products from the AROME EPS.	4	6
Technical code and system development	SY1	Code optimization	Daniel Santos, Ryad El Khatib	Delayed or issues	In Harmonie-Arome, 4D-Var and mixed single-double precision will be implemented in resp. Cy43h2.2 (end 2020) and Cy43h2.1 (summer 2020). BSC project delayed due to late start, report on phase 1 expected end March. In MF, continued efforts in order to optimize the AROME Fortran codes, with a view on comparing between different X86-style processors. A single-precision forecast of AROME is now systematically being tested while building a new T-cycle version, with the support of Aladin phasers in Toulouse.	16	6.5
	SY2	Maintenance and development of the Harmonie Reference System	Daniel Santos	Delayed or issues	Cy43h2.1 declaration delayed due to need for more testing related to ECOCLIMAP-SG. Other activities mostly on track.	10.25	18.25
	SY3	Revision of the Harmonie scripting system	Daniel Santos	Delayed or issues	Analysis made of different strategies, exploring ECMWF and MF developments and tools. Development of PrepLAM and other changes to make system more user-friendly for experimentation. Cmake compilation to be introduced in Cy43h2.2.	3	1
Towards modelling at (sub-)km resolution	HR1	HR1 Bogdan	Sander Tijm, Martina Tudor, Claude Fischer	On track	Dynamics, physics and ensemble settings have been established for a high-resolution Harmonie-Arome configuration (not yet for DA). Experiments continued over various domains. No studies on shallow convection/turbulence on these scales done yet. Single precision tests showed comparable meteorological performance. Implementation of horizontal gradients in AROME physics; analysis of the response of AROME turbulence at resolutions between 500m and 1.3km over the EUREC4A domain. A daily real time AROME-500m, with improved vertical resolution, was implemented at MF during the SoFog3D campaign. It used ICE3 microphysics scheme and ECOCLIMAP1 surface data base.	37.5	40.25

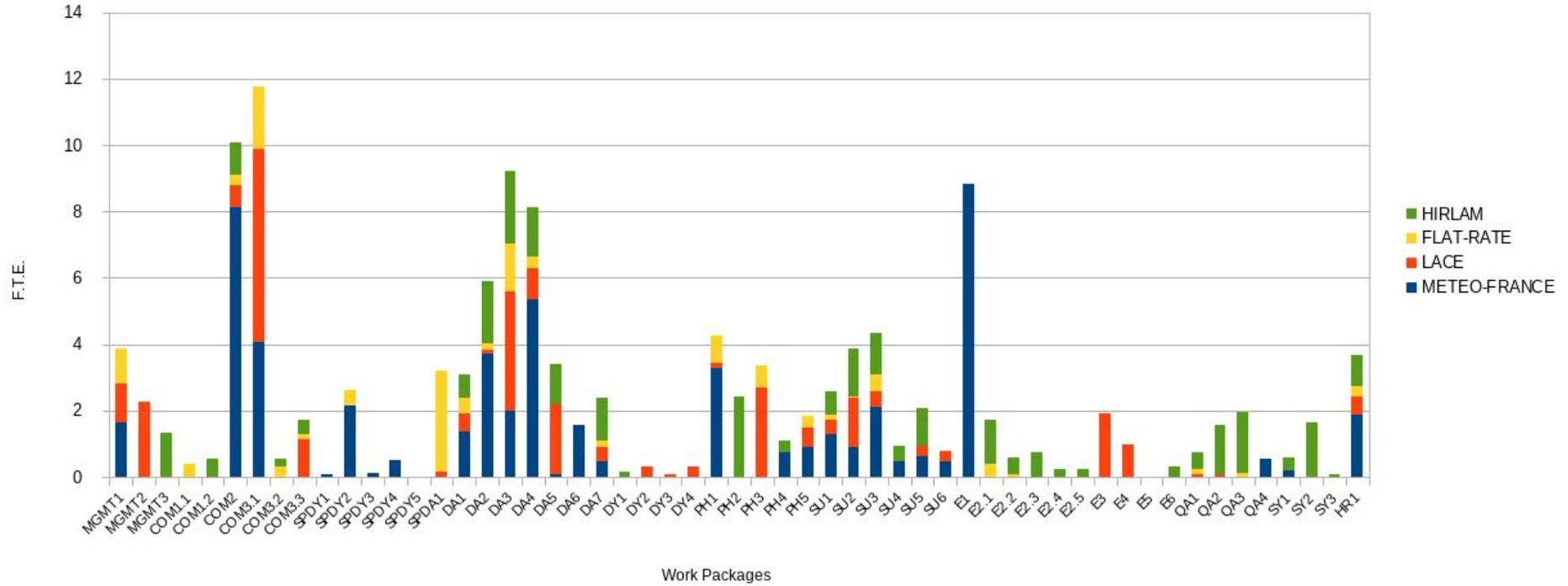
Manpower (in F.T.E) in 2019 RWP Work Packages

Committed for 2019 and Realised in 2019



F.T.E reported on each Work Package in 2019

breakdown by groupings



Manpower reported in 2019 in each domain domain

breakdown by groupings

