

## Status on April 17, 2020

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

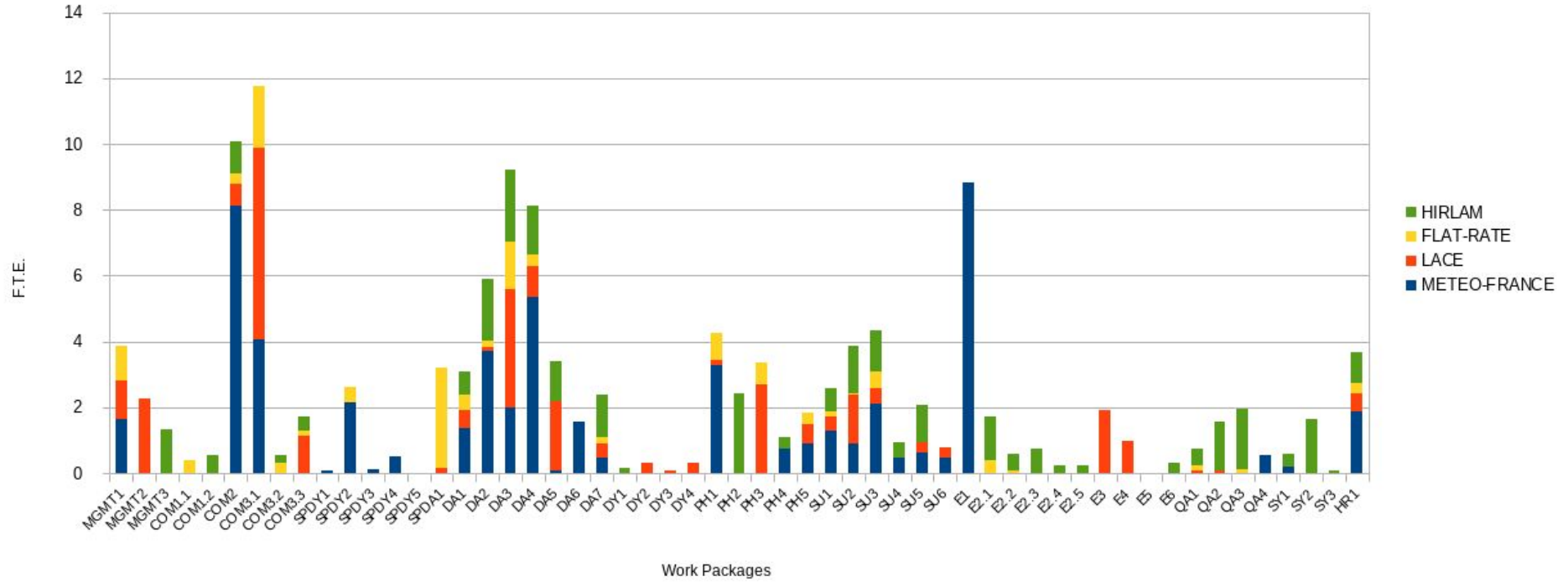
# Manpower (in F.T.E) in 2019 RWP Work Packages

*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

