Participants

Flat-Rate ALADIN MoU5 Representatives	*Rafiq Hamdi (Belgium): absent*
	Ilian Gospodinov (Bulgaria)
	Vanda Costa (Portugal) replaced by Nuno Lopes
RC-LACE-MoU5 Representatives	Christoph Wittmann (Austria)
	Kristian Horvath (Croatia)
	Simona Tascu (Romania
HIRLAM-C Representatives	Saji Varghese (Ireland) **STAC Chair**
	Xiaohua Yang (Denmark)
	Sami Niemelä (Finland)
Météo-France Representatives	François Bouyssel
	Alain Joly
	Christine Lac **STAC vice-Chair**
ACCORD PM	Claude Fischer
ACCORD CSS	Patricia Pottier
ECMWF Observer	Irina.Sandu
Invited experts and CSC Leaders	Eric Bazile (AROME CSC leader) Alexandre Mary (Integration Leader) Jeanette Onvlee (HARMONIE-AROME CSC leader) Martina Tudor (ALARO CSC leader)

1. Opening and introduction virtual tour de table

Saji (STAC chair) opened the meeting and invited the new participants to take the floor and present themselves: Christoph Wittmann from Austria replaces Yong Wang, Irina Sandu replaces Peter Bauer as ECMWF observer. In addition to the CSC leaders who had already attended the previous meeting, the Integration Leader (Alexandre Mary) had also been invited to join this meeting.

2. Adoption of the draft agenda

The agenda is unanimously adopted.
Saji reminded the main role of the STAC: the STAC should review annually the progress of the Consortium, based on reports by the PM on the realisation of the manpower commitments and the achievements of the RWP actions; the STAC should also review annually the RWP proposed by the Project team, and the commitment of manpower for the following year; the STAC reports its conclusions to the Assembly, generally under the form of recommendations

The discussions during the STAC meeting are reported in the next items. More details on achievements in 2021 or the plans for 2022 can be found on [Claude' slides](#) *on the* [STAC meeting web-page](#). *The resulting recommendations have been summarised by the STAC chair, PM and CSS after the meeting (see Annex I).*

3. Reports by PM:

a) *achievements of the RWP2021[1] actions*

Claude first introduced the Management Group (who co-wrote the scientific report on 2021 work) and presented the management tools established in ACCORD (Common Manpower Register CMR, Rolling Work Plan RWP, communication tools such as website, email lists, wiki, Google Drive, Slack, ACCORD Newsletter 1, budget mechanism).

Claude explained that the MG have organised the work in their scientific area in order to enhance interactions between the ACCORD teams and families: this will be fully visible in the RWP2022 when it is not already the case in the RWP2021. Some transversal WGs have been established. On code integration and system aspects, new methods of working are being implemented. Questionnaires were also sent to the teams to assess their practices and/or needs in MQA, on system aspects and model outputs.

Claude then highlighted few items per Area and gave examples of realisations:

- first steps towards a more continuous code integration process, with first tests with DAVAÏ, prototyping a source code forge (see item 5), code optimisation, profiling, coordination of the system local installation (in coordination with the CNA),
- SPTR1: work package on addressing future evolution of software infrastructure in order to prepare ACCORD codes for novel technologies, such as GPUs, vector accelerators, FPGAs, …
- Dynamics: regular improvement of the current SISL-ST time stepping, development of a grid-point SI version,
- Upper-air DA: progress on improving the current algorithms and implementing new ones,
- Upper-air DA observations: optimisations in computations of VarBC coefficients, improvements of pre-processing and assessment of the use of new observation types,
- Surface: study new options for SURFEX and the possible use of a same version across the 3 CSCs, obvious challenge to improve the physiography data sets, new algorithms for DA and new observation types,
- EPS: progress in SPP studies for model perturbations, active topic on how to make the best of the EPS information for the users, including the forecasters,
- Meteorological Quality Assurance (MQA) is being promoted within the consortium, with encouragement to Newsletter contributions (MQA3 efforts count for the "CEpQA" - Code Engineering, phasing and Quality Assurance - manpower monitoring), a questionnaire was sent to the teams and is now triggering MG thoughts; harp is a widely shared tool,
- Physics: there is no Leader for Physics, the work is coordinated in several ways. The roadmap for an enhanced interoperability across the Physics packages is studied by the interoperability WG; a number of work packages benefit from transversal coordination like PH6 (Cloud-Aerosol-Radiation interactions) which is a very good example of transversal work done across families in an excellent spirit, three specific work packages reflect the coordination within each CSC team.

Saji thanked Claude for his very comprehensive presentation and opened the floor for comments or questions.

Xiaohua appreciated the progress made in various important topics and the acceleration of cross-families researches. He underlined the importance of the future developments in SPTR and asked if the code refactoring work would open for application to different HPC architecture with different GPU realisation. Claude explained that the bidding team for DestinE-LAM is working on a dedicated WP on code adaptation in their proposal. The proposed solutions might differ according to the different parts of code and the computers available on EuroHPC platforms. Very specific pieces of the code, hopefully very few, might need to be duplicated to have different versions for different architectures.

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[1] The [Rolling Work Plan for 2021 (RWP2021)](#) was approved by the ACCORD kick-off Assembly at the end of 2020.

Xiaohua asked about the computational cost of the EnVar algorithm. Claude and François answered that the computational cost is acceptable when compared with VAR, the main issue being rather the increased memory cost.

Sami acknowledged the challenging task in physics as most of the work is currently on the different CSCs. He appreciated the work already done in common (i.e. PH6) and asked about further plans to get more interoperability. Claude explained that the WG on interoperability is working on a proposal to increase and modify the codes that control the interfaces to the different physics. Other aspects might increase the transversal work in the physics: the possibility for the 3 CSCs to have the baseline version for the forecast model using SURFEX, then to the progress towards the use of the same release of SURFEX by the 3 CSCs, for instance. Continuing the effort on the transversal activities already planned in the RWP is also important.

Kristian commented that, according to the realisation in 2021, the approach in post-processing differs quite a lot between the teams and groups. In some areas, an important part of the manpower is dedicated to post-processing tasks, thus Kristian asked about any effort in the MG to harmonise the way post-processing is organised in the different areas or to group the post-processing activities in a single WP. Saji appreciated the question in link with the importance of avoiding duplication of work. Claude answered that this wide-ranging question on post-processing might not have a single answer. A questionnaire was launched to understand what post-processing of model fields (deterministic) is done in the teams, which diagnostics or model outputs they wish or they work on, in order to help them to develop or improve these post-processing and to avoid duplication of work. Some post-processing might be available in fullpos, others might remain off-line (developed by the teams, outside the common code, for very specific local needs). ACCORD will focus on harmonizing post-processing close to the model fields (ie fullpos or other inline diagnostics like DDH). There are no firm plans to have a strong code collaboration for specific EPS diagnostics outside the common codes, besides to encourage scientific exchanges between the teams, on their goals and the methods they use.

b) *realisation of the manpower commitments*

Claude presented some statistics on the registered manpower for the first 2 quarters of 2021: for most areas, the achievement at mid-year is at least 50% of the expected values for the whole year. For MQA, the realisations are already above the expected commitments for the whole year. For SPTR, the expected effort was small but there is a very good realisation at mid-year. At the more detailed level of the Work Packages, some WP are above the commitments such as COM2.2 (effort on the evolution of the work practices and environment), E7 (development of user-oriented approaches for EPS), MQA3 (meteorological quality assessment of new cycles and alleviation of model weaknesses).

The figure of the realisation of the manpower since the common registration between ALADIN and HIRLAM (January 2018) shows a slight increase over time. The repartition of the type of work shows an increase in management effort since this year (with the full-time position for ACCORD PM and other management positions), there is also an increase for CEpQA. The main effort is dedicated to Research & Development work. An increase in the training & tuition effort is likely to append when physical meetings will be possible.

Sami pointed a mistake in 2 manpower figures distributed in the preparatory document 3.Report_PM. Patricia confirmed that there is an error on the legends and proposed corrected versions of the figures.

Christoph asked about the expected evolution of the manpower accounted for in the MNGT WPs. Claude explained that in 2021, some management was still declared in MNGT1-2-3 (ALADIN, LACE, HIRLAM) during the first quarter but, from the 2nd quarter of 2021, only MNGT4 (ACCORD) is accounted for. It was agreed with the MG and explained to the LTMs that the coordination work (scientific management of tasks in the ACCORD RWP) done by the LACE or HIRLAM Project Leaders should be counted in the R&D WPs where they are active and can be declared as "management" type of work rather than R&D type.

Patricia added that the work committed in the MNGT4 WP for 2022 includes 1 FTE for the PM, 1 FTE for the CSS, 1 month per LTM, 0.5 FTE for each CSC Leader. The manpower reported in MNGT4 is about 6

FTE per year (3 FTE during the first semester), while the manpower reported as management type of work (in MNGT WP and in R&D WP) is twice as much.

4. Review of proposal for 2022

a) RWP2022 actions

Claude explained that the RWP2022 was re-organized more or less deeply in most Areas, to reflect to the re-organisation of the work by the MG, with an enhanced across families collaboration. MG invited co-leads for many WPs, encouraging team building for working together on drafting the tasks. Claude summarised some highlights and novelties proposed for the RWP2022 in the different Areas:

- code integration & System: pursue efforts towards a Common Working Environment for codes, start addressing what a common scripting system could be, use of the Local Team System Representatives forum, training for new tools, find additional manpower once a concrete work plan proposal is drafted for scripts,
- SPTR: more concrete work on adaptation of pieces of the code, testing of existing of source-to-source transformation tools, restructuring of the dataflow in the upper-level control routines,
- dynamics: ensure a continued effort on long term issues such as improving the stability of current SISL-ST time stepping, develop a grid-point SI version, work on understanding the FVM code from ECMWF and study its extension to LAM,
- DA: increase transversal work, work organised along the lines of the Research/Support Teams established in 2021, increase efforts on OOPS-based solutions, continue current efforts on use of observations (those efforts will remain depending on which observations are available locally),
- surface: use SURFEX in all CSCs and use more widely its new options, further evaluate ECOCLIMAP-SG and start elaborate a long-term strategy for improving land cover data bases, continue studies on different algorithms for surface DA and continue explore new observation types,
- EPS: strengthen the cooperation on research about model and surface perturbations, ensure interoperability of SPP solutions, start addressing the issue about common scripts for EPS which is for the time being very open, continue to increase the transversal exchange of knowledge on post-processing aspects and ensure optimal link with the Eumetnet/C-SRNWP program on EPS,
- MQA: better promote the harp tool (training course, increased user friendliness, new metrics, new observations), keep a good focus on verification for VHR models, MG will consider how to further staff the work on harp,
- physics: finalise the roadmap (by the WG for interoperability, PH9) and make sure it is well known by the teams, keep steady effort on WPs that are transversal to all CSCs (PH4, PH6) or more on research side (PH7, PH10), monitor and possibly organise work on model output (PH5), start the process for a call for applications for the physics AL,
- thematic WGs: ML, VHR have started in 2021 and will continue until early summer 2022; seamless DA WG should start in 2022.

Alain provided updated information about the recent status of plans and progress at ECMWF, regarding the code adaptation work for the IFS, and what this means for the 2022 ACCORD planning, especially on the SPTR plans. Alain acknowledged the difficulty in having an accurate up-to-date formulation for the SPTR Work Package taking into account the quickly evolving situation in this area. Alain gave technical points where he proposed the SPTR WP for the RWP2022 should be updated:

- decrease priority on: dwarfs, ATLAS (no short term plans to implement it operationally in IFS) and CLAW (initially developed by COSMO but no longer maintained),
- increase priority on: refactoring of the codes especially in the grid-point computations (need for a serious and deep reorganisation of the way parametrisations are called,), implementation of smart data structures, LOKI or custom scripts for source-to-source code transformation,
- consider the recent plans at ECMWF on the spectral transform codes and the work plan prepared by Philippe Marguinaud for the LAM spectral transforms, check whether these plans for the LAM transforms are aligned or not with those for the global transforms.

Alain insisted on the urgency of making progress on code adaptation (taking the DestinE timing into account) and the necessity to involve more code experts on code adaptation.

Claude answered that physics experts have been invited to SPTR discussions, and a message regarding both the urgency and the link between code reorganisation and the physics, including the need to work on physics interfaces very quickly, has been passed to the CSCs.

Given the quickly evolving situation regarding the SPTR progress and planning at ECMWF, Alain proposed the organisation of frequent transversal technical meetings involving the relevant teams from IFS, MF/Arpege(/Arome) and ACCORD/SPTR, perhaps in addition to the already existing IFS/Arpege coordination meetings where code releases (cycles) and planning in general are being discussed. Irina proposed to check with Michael Sleigh whether such work organization is fine with the relevant team at ECMWF. Alain also suggested that the RWP SPTR text should be revised in view of the most recent progress and planning known from ECMWF. Claude answered that he will discuss this with Piet and Daan, as well as the proposal for more regular transversal meetings.
Saji proposed that the STAC monitors this issue.
Saji proposed that considering the urgency in addressing the code adaptation work, the STAC encourages the NMSs to dedicate more staff towards this activity.

About ACCORD plan on dynamics (to work on understanding the FVM code), Irina pointed that FVM won't be ready to run coupled forecasts for phase I of DestinE (main effort for phase I will be on improving the current IFS SISL-ST NH and comparing NH & H solutions, not on FVM). Claude confirmed that the ACCORD plan is only to find staff to explore this solution for LAM, while the ACCORD-based proposal for DestinE-LAM phase I will be based on the SISL-ST dynamical core as well.
Irina confirmed that technical and scientific positions will be opened soon in DestinE framework and these resources will also help improve the IFS model (for the Extreme Event Digital Twin, for porting to the EuroHPC machines).

b) manpower commitments

Claude presented a summary of the manpower commitments for 2022, which are mostly stable with respect to 2021. The management effort will be equivalent. The MG and the LTMs are still refining the numbers. Claude reminded that ways for adding manpower in HARP or in system area will be investigated. Some additional staff may be hired by Met.no. (on code adaptation).
Claude may propose at the Assembly to slightly adapt the accounting for CEpQA for 2022, adding also the work done on some WPs that need to be promoted (i.e. code adaptation effort).

5. Exploration of a source code forge for ACCORD

Claude explained that one strategic goal in ACCORD is to modernise and improve the working practices on the common codes towards more collaborative, network-based, continuous work in the common codes, while abiding to the (also evolving) IFS-Arpege practices. This led to some exploration for a common source code forge, based on different GIT-based solutions, that are explained in the analysis note proposed to STAC. The note summarizes the current understanding by the MG of pros and cons, and the potential issues regarding policy, management and pricing. The note is intended to be circulated across all partners involved in the common code work (ie ECMWF, MF for IFS/Arpege and ACCORD bodies).
The MG will continue to explore technical solutions, to better draft the questions at code policy, maintenance & manpower and pricing levels. Claude proposed to bring these questions at the Assembly level in 2022.
Claude explained that another expected change while modernizing our working practices on common code collaboration, is to share the GIT history (to ensure the "traceability of code changes") across ECMWF (for the IFS) and MF/ACCORD (for the T-cycles). One concrete consequence is that a version of the LAM codes will be copied from the MF-Toulouse repository inside the IFS repository at ECMWF. Claude proposed to discuss at an upcoming IFS-Arpege coordination meeting the code collaboration policy through an agreement on good practices for the ACCORD LAM codes when they are in the IFS repository.
Claude asked the STAC members about any comments or issues that they may have on this exploration and the possible solutions proposed in the note.

Xiaohua appreciated the exploration and the note. He mentioned the similar ongoing work in UWC-W about a tool for introducing best practices security-wise. Xiaohua sees a good synergy there with the ACCORD efforts and suggest exchange of relevant experiences between the system experts.

Saji pointed that, as these solutions will have implications on code policy, they should also be discussed at PAC level. This item will be discussed at the next Bureau meeting.

Sami supported this proposal for a modern tool, in-line with ECMWF solutions.

The STAC expressed great interest and supported further exploration in this area. It also suggested that better sharing of code development branches with ECMWF will also help the work on code adaptation and the plans for SPTR aspects.

Alexandre wished to test the GIT solutions for cy49t1 (starting summer 2022). Technically speaking, it would be quick to implement once he gets an agreement of all the parties (ECMWF, MF and ACCORD) on the choice of the platform (cloud or in premises) and on the question of the convergence of ECMWF and ACCORD repositories history (based on copying the LAM code in the IFS repository). It would be good to have this agreement before the start of the merge for the next common cycle IFS-Arpege cycle in March 2022 (cy49).

STAC recognized that additional questions can arise, beyond the technical ones (code policy, maintenance and manpower, pricing).

STAC recommended to the Assembly to convene a PAC meeting to address these questions as soon as the proposal on source code forge is mature for consideration (this appreciation is left to the MG), with the aim to enabling the technical tests for cy49.

6. Date of the next STAC meeting

STAC has to meet once in the autumn, roughly one month before the Assembly meets, to review the report on the current RWP and the RWP proposed for the following year.

The STAC agreed to plan an additional meeting in spring or at the very beginning of summer, to discuss:
- **the consequences of DestinE-LAM work plans (if the ACCORD-based proposal is chosen) on the ACCORD work plans, especially on code adaptation and VHR plans,**
- **the progress on the source code forge,**
- **the progress on code adaptation (transversal meetings outcome, SPTR plans, …).**

Among the 2 meetings planned in 2022, one could be organised as a physical meeting, the other one as a video-conference.

Nuno raised the question of enlarging the STAC composition to have more specialists within the representatives. Claude answered that the composition of the STAC is defined by the MoU and changing the composition would need an amendment approved by the Assembly.

Saji proposed that the families revisit their current representation if they felt a need for having more specialists. Depending on the items at the agenda, the STAC can also invite additional experts as was done for this meeting with the invitation of the CSC leaders and the integration leader as observers.

7. AOB

None.

8. Closing

Claude appreciated the comments and proposals from the STAC members.

Saji gave credit to the PM and the MG for all their effort in organising the work in ACCORD and ensuring deeper integration of the families.

Saji thanked the STAC members and the invited experts for the fruitful discussions during the meeting and closed the meeting at 13:20.

Annex I: STAC recommendations

STAC reviewed the work done in 2021 and discussed the progress report.
- STAC appreciated the work done in establishing and organising the MG, the management tools established in ACCORD, the new organisation of the work in the different Areas (like Research and Support Teams in DA) in order to enhance interactions between the ACCORD teams and families.
- STAC appreciated the many specific efforts that have been carried on by MG regarding various aspects of interoperability and sharing common work practices across ACCORD. Examples are the start of the exploration for a common working environment for code integration, physics code interoperability, questionnaires about meteorological quality assurance or system aspects etc.
- STAC considered that the several Working Groups established by the MG will also prove efficient for enhancing the consortium-wide collaboration and share of transversal knowledge, transversal goals for the future.
- STAC recognized the significant efforts undertaken by the MG in order to prioritize the work plan tasks, with the understanding that additional priority tasks will still be defined in 2022 (and perhaps beyond).
- STAC acknowledged the preparatory work organized by PM+MG, with the STAC WG, for DestinE (leading to the STAC WG note of recommendations for the DestinE drafting team).

STAC recommended the Assembly to adopt the progress report.

STAC reviewed the proposal for the RWP2022.
- STAC recognised the importance of making progress in code adaptation.
- STAC recommended an increase in information exchange on transversal aspects and an enhanced collaboration between ECMWF, MF and ACCORD teams who are involved in code adaptation to new HPC architectures (SPTR). STAC recommended that the teams meet frequently to review progress, assess their work plans and possibly share their work. Given the need for such frequent meetings, STAC encourages the Leaders from the involved organisations (ECMWF, MF and ACCORD/PM+SPTR Area Leaders) to agree on such working arrangements.
- STAC recognised the urgency of making progress in code adaptation. One concrete example to illustrate the timelines for achieving some progress is the DestinE Phase I timing, where the forecast model code should show some level of code adaptation to mixed CPU-GPU (or actually other architectures as well, like Intel CPU based), by the end of 2023 or 2024.
- STAC recommended finding solutions for the lack of trained or expert resources for the code adaptation, on a priority basis.
- STAC acknowledged the difficulty in having an accurate up-to-date formulation for the SPTR Work Package taking into account the rapidly evolving situation in this Area and the external constraints (ECMWF). The SPTR plans for 2022 should be revised with the most updated information from all partners as needed.

Taking into account the above remarks, STAC agreed on the proposed Rolling Work Plan for 2022.

STAC reviewed the source code forge analysis note.
- STAC supported the exploration of solutions for modernizing the working environments for code collaboration (like the source forge tool).
- STAC recognized that additional questions can arise, beyond the technical ones (code policy, maintenance and manpower, pricing).
- **STAC recommended to the Assembly to convene a PAC meeting to address these questions as soon as the proposal on source code forge is mature** (this appreciation is left to the MG).