

ACCORD

A Consortium for COnvection-scale modelling
Research and Development

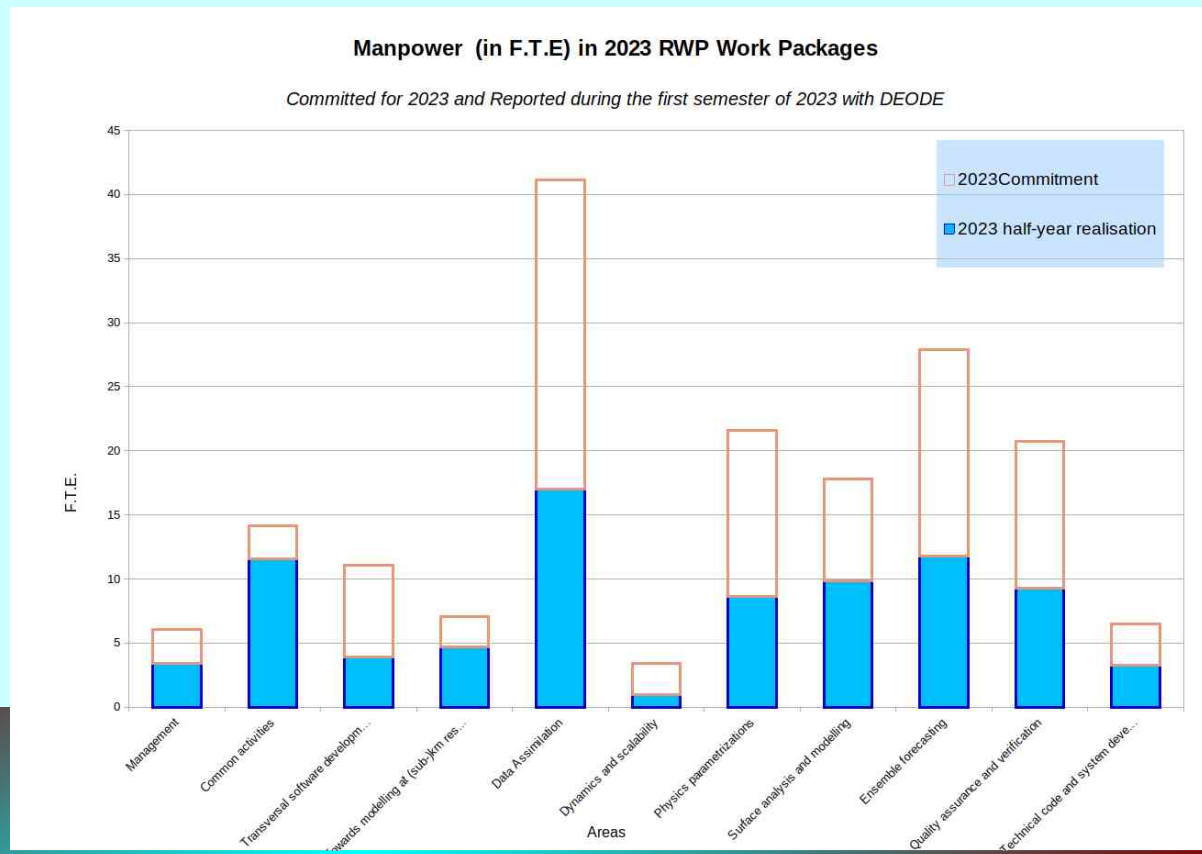
PM slides for Assembly-7

Claude FISCHER, ACCORD/PM

7th ACCORD Assembly, ECMWF, Reading and online, 4 December 2023

3.a Reporting on RWP2023

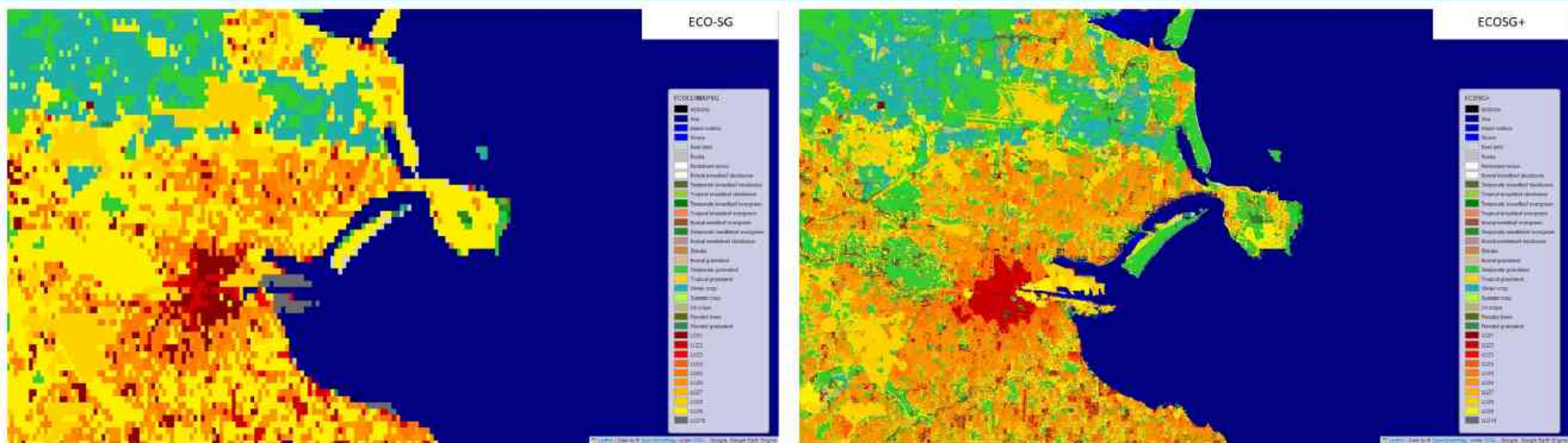
- Realization of manpower at mid-term: ~50%
- COM activities with increased registration w/r to commitments
- DEODE-funded registered manpower for Q1-2/2023:
 - significant increase in SPTR (~50%), also in VHR modelling (~30%) and Surface (~20%)
 - some increase also expected in Dynamics for Q3-4/2023



Q1-2 including DEODE-funded manpower =>

3. Surface

- Physiography
 - using an AI-based tool to improve VHR land cover maps over Europe



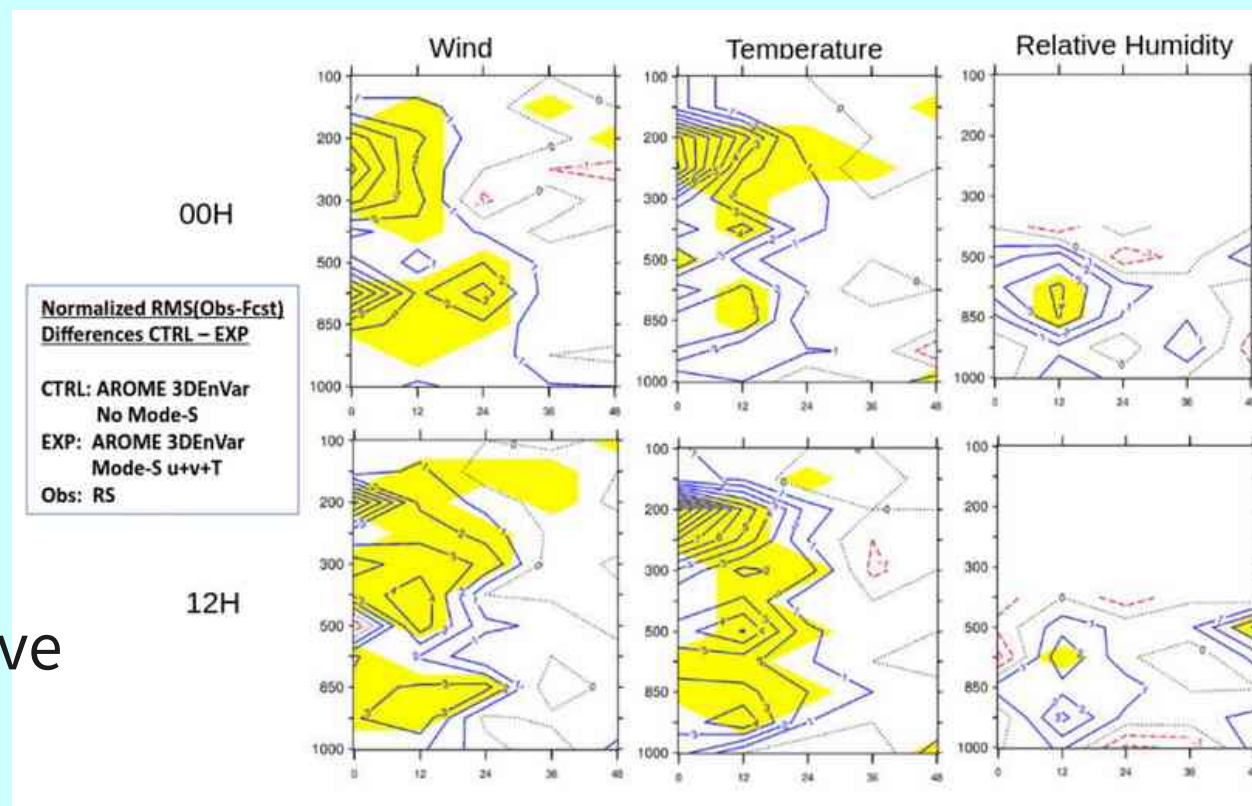
ECO SG (left) and ECO SG plus (right) - a target map, based on the decision tree. (Met Eireann)

- a common SURFEX code version now is in place in both the IAL and the Surfex repos

3. (Upper-Air) Data Assimilation

- Impact of Mode-S observations

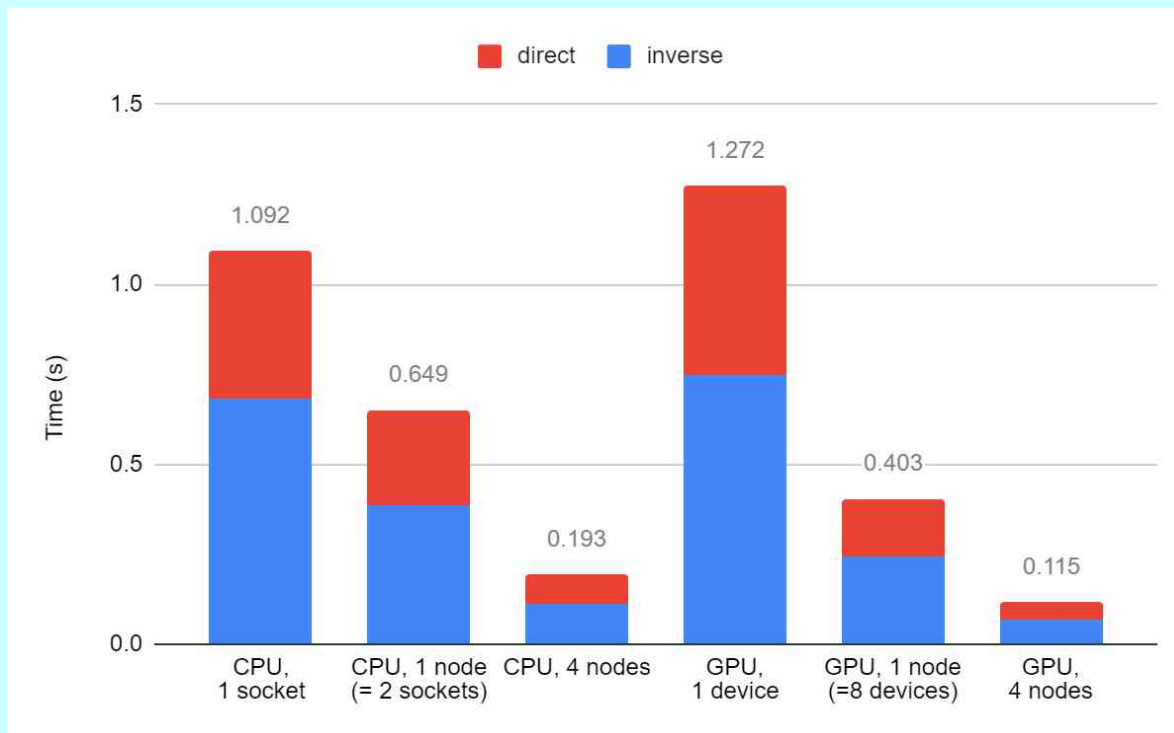
using the 3DEnVar assimilation scheme (under OOPS) enables to retrieve a much clearer positive effect for these data



Normalised RMS differences between experiments with and without Mode-S EHS data in 3DEnVar AROME-France over 1 month period. Improvements in blue, degradations in red.

3. SPTR (code adaptation)

- porting parts of the LAM codes to AMD-GPU: spectral transforms, ACRANE2 scheme (for the latter, use LOKI for s2s code adaptation)
- create the new Méso-NH/Arome physics code library “PHYEX”
- start adapting the Arome physics interface routine APL_AROME
- a code refactoring training workshop was held at CSC (October)



Timings of LAM spectral transforms on AMD CPUs and AMD GPUs. The grid dimensions are 1536 x 1024 x 100, with a linear spectral truncation. Transforms include 3 scalar fields, 2 wind fields and derivative calculations.


3. Integration of code contributions, source code forge for ACCORD

- use of the ACCORD source code forge and of “davai” for CY49T1
- several webinars were organized by the Integration Leader in order to present the forge and how to work in this new environment (about 60 participants each time)
- davai-contributors (second) WW in 2023: team building continues ! (MF, DMI, RMI, KNMI, Met.no, SHMU)

ACCORD Forge

Web platform hosting consortium-wide repositories and their associated communication environment (wiki, ticketing, integration requests, reviews...)

<https://github.com/ACCORD-NWP>

- **IAL** (IFS-Arpege-LAM) *private* repository : official portal for contributions to 49T1
- Series of **training webinars** to be organised this spring, combined with Davai webinars : information and registration on https://opensource.umr-cnrm.fr/projects/accord/wiki/accord_forge_Spring2023_Webinars
- Getting started :
 - Set your  **GitHub** account, **using an explicit identifier** and professional email address
 - Request membership by email to Daniel Santos Munoz and/or Alexandre Mary, indicating your Github identifier and associated email address

All Staff Workshops

- All Staff Workshop in March 2023, hybrid format (Tallinn and online)
- 2024 ASW in Sweden (Norrköping) and online: 15-19 April 2023



<http://www.accord-nwp.org/>

3.a Recommendations from STAC

STAC in its meeting on 25-26 October formulated the following recommendations:

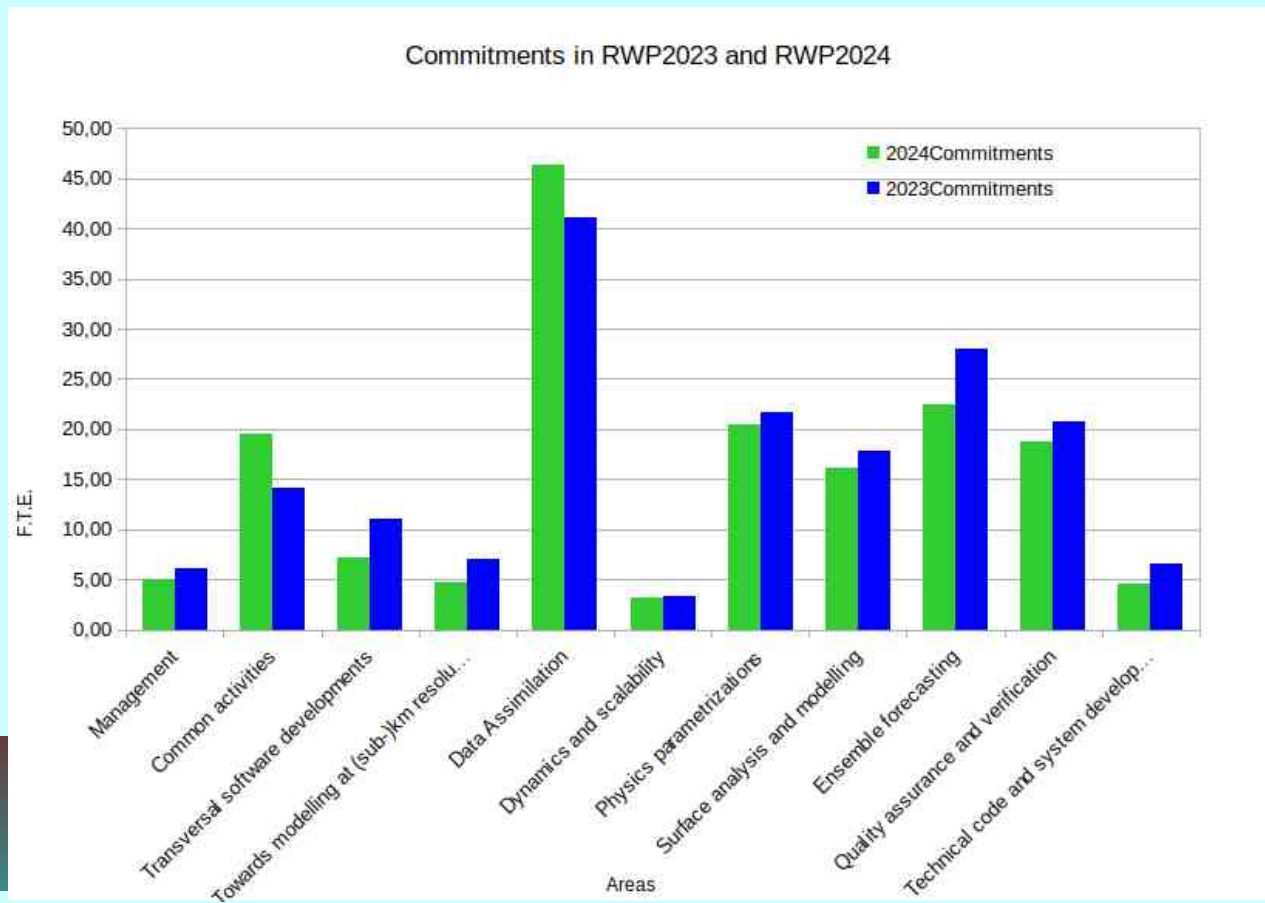
- STAC reviewed the work done in 2023 and discussed the progress report. STAC acknowledged the huge amount of work and the achievements across all thematic areas in ACCORD. STAC highlighted the benefits from the DEODE project in relation to ACCORD: increased coordination, communication and training, acceleration of technical aspects such as in code adaptation, setting up system-related configurations.
- STAC recommends the Assembly to adopt the progress report.

3.a Actions for the Assembly

- **Comment.**
- **Approve the progress report.**
- **Approve the repartitioned manpower realization of Q1-2 of 2023: the figures will enter the voting procedures (*ref to Table 1 in the preparatory document 3.a with 2023/Q1-2 added to the manpower figures for 2021-2022*).**

4.a RWP2024: manpower commitments per RWP-Area compared with 2022

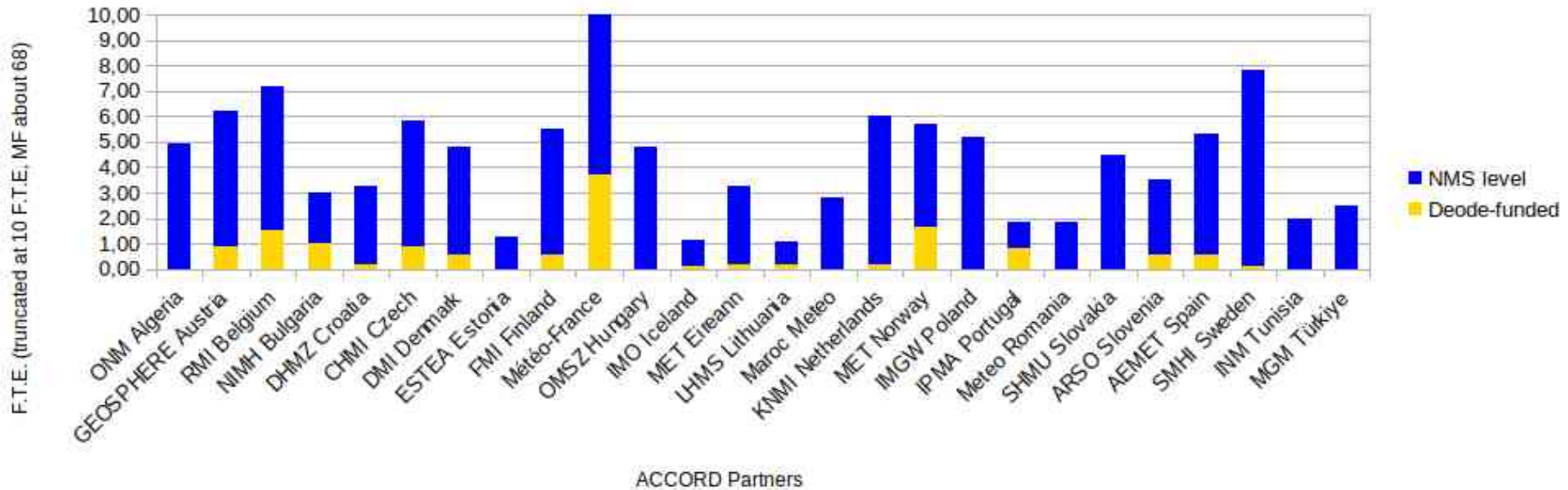
- decrease in SPTR and in several other areas, partly due to uncertainty regarding DEODE-funded manpower currently under negotiation for Phase 2
- ML tasks are included in the thematic WPs (they are listed in detail in the Introduction Section of the RWP2024 => “combined ML-NWP tasks” in ref to Item 9 of this Assembly)
- increase in “common activities” WPs (COM): more difficult to explain, could be partly linked to the changing work practices (this figure was smaller for 2023)



4.a RWP2024: committed manpower per Member, including DEODE

- note: Tunisia (INM), Maroc-Météo, Meteo Romania, Turkey (MGM), Algeria (ONM) are not members of DEODE
- otherwise all NMSs who are both members of ACCORD and DEODE have some manpower funded by DEODE allocated to ACCORD WP-relevant work

F.T.E. Committed by ACCORD Partners on RWP2024
breakdown by funding (DEODE or at the NMS level)



4.a Headlines from RWP2024: working practices, user feedback

- modernization of working methods:
 - extend the use of the forge and of davi across ACCORD
 - further build competence in the “davi-contributors” team
 - further understand how we can extend common testing and common validation of new code releases
 - start working on common scripts (DEODE-based?)
- user feedback (R2O/O2R):
 - start working with the User Representatives
 - as this is a totally new effort at ACCORD-level, we will certainly learn from the process as we build it

4.a Headlines from RWP2024: combined AI/ML-NWP items

- About 18 WPs contain references to AI/ML related to “combined AI-NWP” research
- there is both motivation and an increase of competence already taking place in several teams
- how can ACCORD in the short term facilitate these efforts ?
 - consider organizing a scientific forum (continuation of WG-ML ?)
 - more generally, propose a platform or a forum where the teams can discuss their plans and their potential participation in joint externally funded projects ? (proposal from LTM meeting)
- toward a strategic vision about AI/ML for NWP in ACCORD ? => refer to the scientific strategy preparation (Item 9 in this Assembly’s agenda)

4.a STAC recommendations

- STAC recognized the very high priority of code refactoring in preparation for porting the codes to GPU-CPU type of architectures. STAC acknowledged the good progress made in several areas of code refactoring over the past 18 months. STAC also recognized the new developments already started or planned. STAC emphasized the need for more staffing on code refactoring and appropriate training.
- STAC recommends the Assembly to adopt the RWP2024

4.a Headlines from RWP2024: code adaptation

- increase efforts on refactoring of Arome, Harmonie-Arome & Alaro physics and dataflow, based on knowledge gained in several teams in 2021-2022
- address re-factoring of other parts of the common IFS/Arpege/LAM codes in cooperation with MF and ECMWF
- we in ACCORD believe that this refactoring is a crucial first step to further adapt and evaluate the source-to-source approach

- we want to keep the plans aligned with DEODE phase 1 and phase 2 targets, however ACCORD has additional work force and a (in a different way) flexible organization (!)
- additional new staff could be available in 2024 and we can organize their training by several ways (tutorials, pairing etc.) => Members are kindly invited to consider whether they can further staff this activity

4.a Actions for the Assembly

- **Comment**
- **Approve RWP2024**
- **Take note of the need for more staffing on code refactoring and appropriate training**

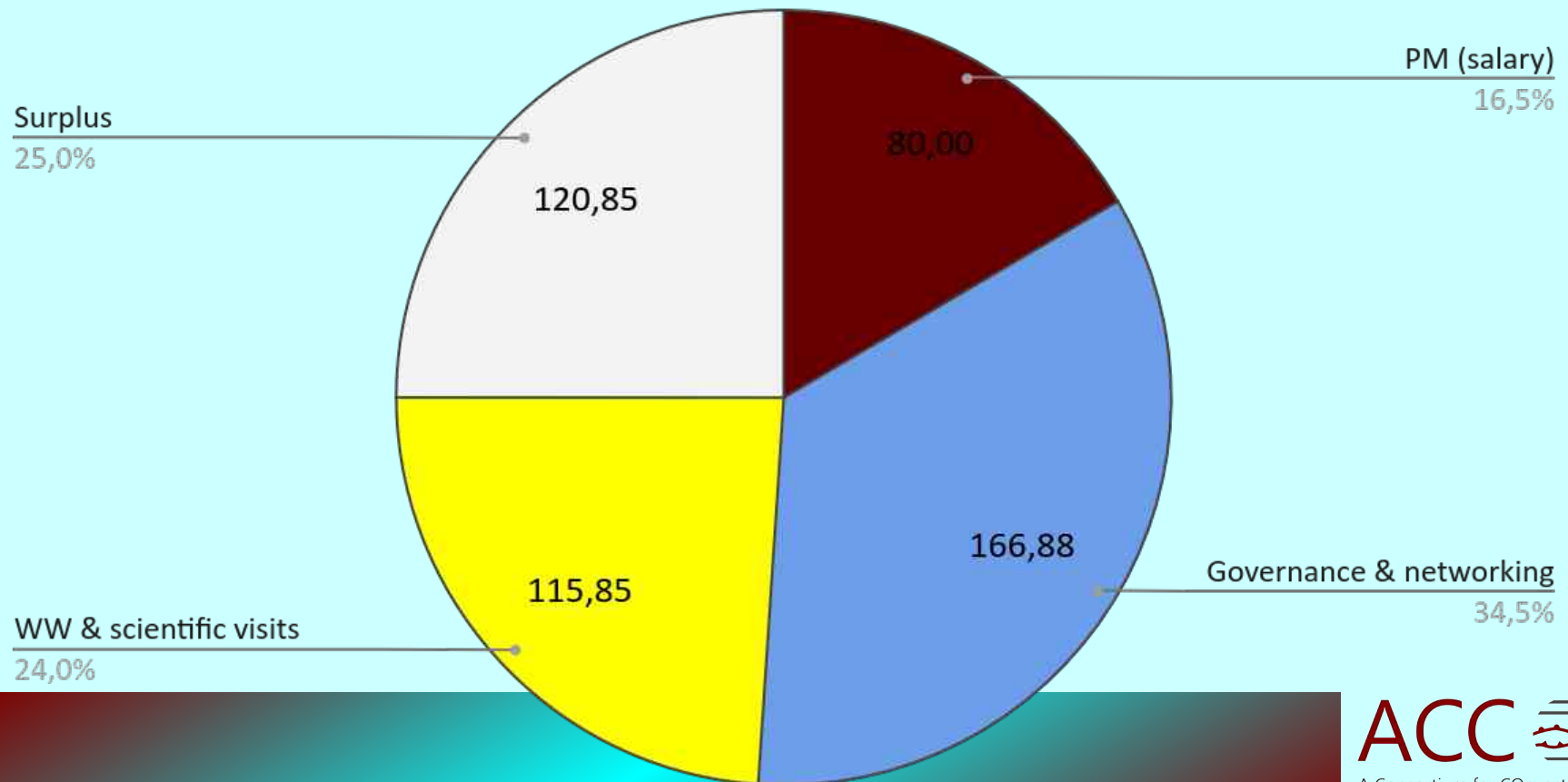
5. Budget: realization of the DAP2023

- good realization of the planned WWs and of the scientific visits
- the signed DAP2023 was published on 17 February, with additional actions decided in the course of the year (until the beginning of the autumn)
- *the outcome of the full realization of actions (done, ~~not done~~) leads to the Table of regularization for 2023 presented in the preparatory document 5 “DAP23-24” (Table 1)*

5. Budget for 2024

- the proposal is to keep the membership fee unchanged: 11 k€ per Member
- the following repartition is proposed:

Proposed repartitioning of 2024 expenditures (k€)



5. Actions for the Assembly

- **Approve the amount to be reimbursed by, respectively to, Members in 2024 for non-executed, respectively additional, actions in 2023 (Table 1 in the preparatory doc 5).**
- **Approve the amount of the membership fee for 2024: 11k€ per Member.**
- **Approve the partitioning of the expenses for 2024.**

6. Governance and management

● Documentation Officer position

- The Call for Applications was open from 3 August through 6 October 2023. One application was received.
- The interview panel composed of the PM, the CSS, The System Area Leader and the three CSC-Leaders decided to interview the candidate and was very happy about the discussion. The panel therefore fully supports the received application.
- The PM is currently staying in touch with the applicant and programme management in order to sort out organizational matters before the proposal can be confirmed to the Assembly.
- The PM will keep the ACCORD Bureau informed about the outcome of these last steps, and suggests that the Assembly could mandate the Bureau to analyze this outcome and decide on an approval of the nomination by the Assembly by an electronic voting.

● STAC composition

- Haythem Belghrissi from INM-Tunisia has left the Committee
- INM-Tunisia has been approached in order to check whether they would like to suggest a new name
- in agreement with the chair of STAC, the proposal is to nominate Mrs Rahma Ben Romdhane from INM

6. Actions for the Assembly

- **Documentation Officer:**
 - **to mandate the Bureau to analyze the DO application and decide on an approval of the nomination by the Assembly by an electronic voting.**
- **STAC membership:**
 - **approve the nomination of Mrs Rahma Ben Romdhane as a representative of the Aladin-MoU5 family**

9. Update on the preparation of the scientific strategy for the next phase of ACCORD

- until now, this was mostly an effort by STAC+MG (below, Brussels hybrid meeting 25-26 October)



*Missing on the photo:
A. Mary, D. Degrauwe, Y. Cengiz,
C. Lac, A. Joly, C. Wittmann, K.
Horvath, H. Feddersen, L. Auger,
M. Shapkalijevski, P. Samuelsson*

9. HLQ within the current scope of ACCORD and with limited extensions

- Around the current IFS/Arpege/LAM (“IAL”) codes, including making further progress on
 - very high resolution modelling, hectometric grid meshes [750m-100m]
 - system and code maintenance, including GPU adaptation, managing the ecosystem of codes etc. *likely requiring an increase of staffing and expertise*
 - R20 white paper thematics (testing, user feedback, documentation)
 - the continued efforts in the main scientific Areas, dynamics, physics, data assimilation and use of observations, surface, EPS and probabilistic forecasting, meteorological quality assurance
- Potential extensions:
 - some higher ambition on Earth-System Modelling and coupling
 - combined AI-ML/physics-based NWP using resources and infrastructure *catered by the partners*
 - more joint efforts on model outputs, diagnostics and post-processing
 - increased ambition on collaborative tools for R&D and its management *which might require to explore some on-pay solutions for the future*
 - *a Data Manager might be needed (anyway) in a foreseeable future*
- The proposal is to move on with the scientific strategy preparation for these aspects

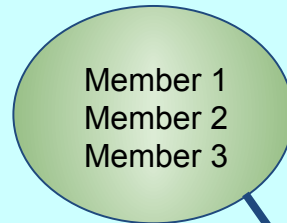
9. “Big HLQ” addressing topics outside the current scope of ACCORD

- Data sharing and a common data-centric infrastructure (or some shared resources within such an infrastructure) suitable for instance for AI/ML studies
- Join efforts on developing common tools to organize model outputs in relation to EU regulations (High Value Datasets) or other international Projects (WMO etc.)
- Collaboration on a solution for a common end-to-end NWP system (from observations until some level of production-ready forecast products)
- Toward some common operational collaboration ?
- Related to the above items, issue about how to handle these questions with respect to other international collaborations (other potential partners, other initiatives like ECMWF pilot projects or the ICWED initiative, Destination Earth)
- To be considered by the Assembly today:
 - Can some of these topics be dismissed, or can we set a strong, high priority on one of them ?
 - Suggestion is to prepare a questionnaire in order to collect all Members’ opinion on the relevance of the (remaining, reformulated) “big HLQ”
 - Form a Task Force around the PM to prepare this questionnaire.
 - PM proposal: PM+CSS, 1 or 2 STAC, 1 or 2 PAC, forming a fair representation of all families with max 6 persons, use 1 external expert on data science ?
 - the PM would work in agreement with the Bureau to form the task force

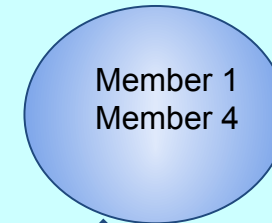
9. “AI/ML for NWP” in the current scope with limited extensions

- 1) each ellipse is a data-centric infrastructure
- 2) each infrastructure is the responsibility of the host institute
- 3) sharing of access and use is based on bi/multilateral agreements between partners of a WP or a task in the RWP

AI tools used for improving physiography data and the representation of surface

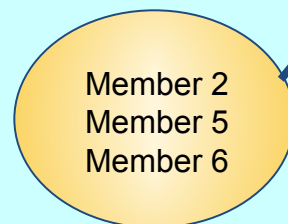


Representing model errors in an EnVar data assimilation scheme using ML tools

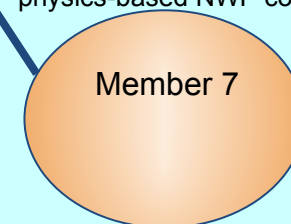


- exchange of scientific results, focus on combined AI-ML/physics-based NWP
- make an “informed” inventory of existing, shareable training data sets
- share AI/ML trained codes via interfaces within our physics-based codes (ACCORD common codes aka “IAL”)
- *((widely shared training data sets ? : issue of volume, of common formats, of common tools to extract and manipulate these data etc.))*
- **the above bullets already are an extension of today’s scope, expected to be feasible with only an affordable increase of cost for the consortium**

Use ML tools to generate additional members in an EPS



Use a ML tool to model a NEW physical process in the physics-based NWP code

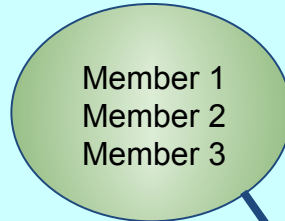


9. “AI/ML for NWP” in the current scope with limited extensions, or with higher ambitions ?

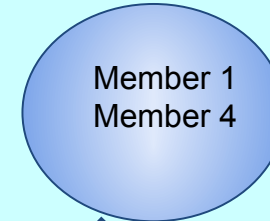
- 1) each ellipse is a data-centric infrastructure
- 2) each infrastructure is the responsibility of the host institute
- 3) sharing of access and use is based on bi/multilateral agreements between partners of a WP or a task in the RWP

- share a work environment including data storage, data extraction and manipulation tools, AI/ML tools, GPUs
- resources should be available to all ACCORD partners (data sets, tools, GPUs)
- such an infrastructure may have a financial cost (on-pay)
- it will require specific staffing resources to design, organize and maintain it

AI tools used for improving physiography data and the representation of surface

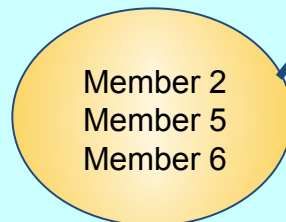


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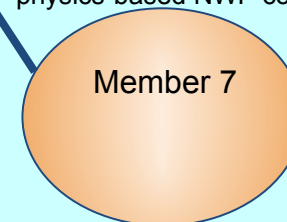


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- ((widely shared training data sets ? : issue of volume, of common formats, of common tools to extract and manipulate these data etc.))
- the above bullets already are an extension of today’s scope, expected to be feasible with only an affordable increase of cost for the consortium

Use ML tools to generate additional members in an EPS



Use a ML tool to model a NEW physical process in the physics-based NWP code



9. Agile management in ACCORD ?

- **Some level of agile management could be appropriate, for the short term preparation and management as well as for the actual drafting of the scientific strategy for the next phase**
 - **splitting the HLQ in terms of their scope**
 - **questionnaire proposal**
- **Take into account some agile management within the drafting of the next phase scientific strategy and the organization of ACCORD**

9. STAC recommendations

- STAC welcomed the reviewed version of the MG-roadmap (*note for the Assembly: the reviewed MG-roadmap was distributed to STAC members, who could further distribute it across their families*)
- STAC with MG discussed the current status of high-level questions for the next phase scientific strategy.
- STAC recognizes the importance of the goals and challenges in relation to the current scope of ACCORD, and which need to be taken into account for the next phase (such as interoperability, how to handle the ecosystem of codes and tools etc.)
- It was recognized that some of these questions relate to an extension of the scope of ACCORD with respect to the MoU1 phase which have important consequences for ACCORD and its Members. STAC recommends that the questions relating to the extension of scope are reformulated and that the PM prepares this reformulation and their discussion inside ACCORD.
- STAC recommends taking into account the need for agility and flexibility for the preparation of the next phase strategy, and taking into account the uncertainties and how to mitigate the risks.

9. Actions for the Assembly

Comment.

Decide on the next steps forward:

- **Regarding the first group of HLQ (current scope with limited extensions), the Assembly is invited to consider approving the continuation of the preparation procedure, following the timeline reminded in Annexe A. The very next step then would be to form the Task Teams to further prepare input to the scientific strategy workshop in spring 2024. The full description of the Task Teams is provided in Annexe D.**
- **Regarding the second group of HLQ (beyond the current scope), the Assembly is invited to discuss whether some of these HLQ should be dismissed already now, and thus should *not* be further considered in the scope of ACCORD for the next period. Conversely, the Assembly could consider only one of these questions to become the priority thematic along which to organize the next steps of discussion on the “big HLQ”.**
- **The Assembly furthermore is invited to consider forming a dedicated task force in order to reformulate the remaining “big HLQ” in a questionnaire form. The Bureau could analyze this questionnaire and decide about its distribution among the ACCORD Members.**
- **Approve that some level of agile management should be defined in relation to the scientific strategy and MoU2**

Take note that several organisational and governance questions have been listed, which could be taken up during the preparation of MoU2 (Annexe C)

10. Strategy for international collaborations around the common codes

- The 6th ACCORD Assembly on 26 June decided to convene PAC with the following goal:
 - *“The Assembly instructed the PAC and PM to prepare a 2-3 page document analyzing how an expanded collaboration could fit into the ACCORD overall strategy and ambition, the advantages versus disadvantages, including a risk analysis and the drafting of a series of questions or requirements for potential candidates, paying attention to the possibilities for ACCORD to provide support.”*
- Headlines of outcome of PAC:
 - PAC agreed on a Table of advantages versus disadvantages (Table 1 in the preparatory document for Item 10)
 - Recommendations by PAC
 - Some additional material, prepared for the PAC meeting, is provided for information in the Annexes 1-2 of the preparatory document (they complement the original request by the Assembly of 26 June)

10. PAC recommendations

PAC recommends to approve the table of advantages versus disadvantages of an expanded international collaboration with the ACCORD codes. Training should focus on NWP and the possibility to use ECMWF training. PAC recommends that the elements in this Table could be used in future to assess the impact of such an expansion.

PAC recommends keeping an open approach to the expansion of international collaboration in ACCORD, and addressing each new request for membership on a case-by-case basis.

PAC recommends that ACCORD approaches ECMWF and re-evaluates with them the following aspects:

- how to handle new membership requests in ACCORD w/r to ECMWF. Does ECMWF support the current case-by-case evaluation ?
- What is ECMWF's vision on expanding its own membership ?
- What is ECMWF's view on the impact of Destination Earth or other EU-funded programmes on international collaboration with the IFS codes, with the ACCORD codes (provided to DE_330) ? How do they analyze the impact of IPR-related issues (licensing etc.) ?
- Does ECMWF envisage in the foreseeable future any significant evolution of its software policy regarding the IFS codes (for instance an open source distribution of the full code) ?
- To organize this discussion, PAC suggests that the Assembly forms a small task team including Assembly representatives and the PM. This task team could report on the outcome of the discussion to the Bureau, who could analyze how to finalize the strategic position paper for submission to the Assembly

10. Actions for the Assembly

Discuss recommendations by PAC. Approve the discussed version of these recommendations including:

- **The Table of advantages versus disadvantages of an expanded international collaboration, whose elements could be used in future to assess the impact of such an expansion**
- **To keep an open approach to the expansion of international collaboration in ACCORD, and to address each new request for membership on a case-by-case basis**

Decide on the next steps, especially to form a task team for approaching ECMWF with the open questions formulated by PAC.

Note the PM proposal for this “Membership-TT”: PM+CSS, chair and vice-chair of Assembly

11. Membership

- Latvia:
 - a. a draft cooperation agreement has been prepared (ref to preparatory doc 11), presented today to the Assembly
 - b. once approved and signed, LEGMC will be invited as observer to the ACCORD Assembly meetings
- Indonesia:
 - a. BMKG has confirmed informally its high level of motivation to join ACCORD
 - b. the Associate Member request remains open
 - c. the planned discussions with ECMWF, on key issues regarding the expansion of international collaboration with the ACCORD common codes, will help preparing the next steps

11. Actions for the Assembly

Comment.

Approve the draft cooperation agreement between ACCORD (allowing signing by the Chair) and LEGMC.

Take note of the update regarding the Associate membership request by BMKG.

12. Dates and places of next Assembly meetings

- *a list of the main ACCORD events is provided in the prep' document for item 12*
- **8th Assembly video meeting: 1st week of July ?.** For information, ECMWF PAC 23-24 April (virtual), EUMETNET Council 28-29 May (Toulouse, F2F), ECMWF Council 19-20 June in ?? (F2F), EUMETSAT Council 26-27 June (F2F)
- **9th Assembly meeting, beginning of December 2024 (potential dates could be Mon 2 Dec or Thu 5 Dec in Darmstadt, or Mon 9 Dec in Reading/Bonn/Bologna),** two half-days or one full day, possibly in connection with the ECMWF Council or the EUMETSAT Council. For information, ECMWF PAC 21-22 October (F2F), EUMETSAT Council 3-4 December (F2F), ECMWF Council 10-11 December (F2F), EUMETNET Council 12-13 December (virtual)
- Action for the Assembly: **Decide on the next Assembly meeting(s)**

AOB

- none for the time being

End of meeting

Thank you and closure by chair