ACCORD

A Consortium for COnvection-scale modelling Research and Development

ACCORD System activities and future perspectives

Dr. Daniel Santos Muñoz, ACCORD AL for System

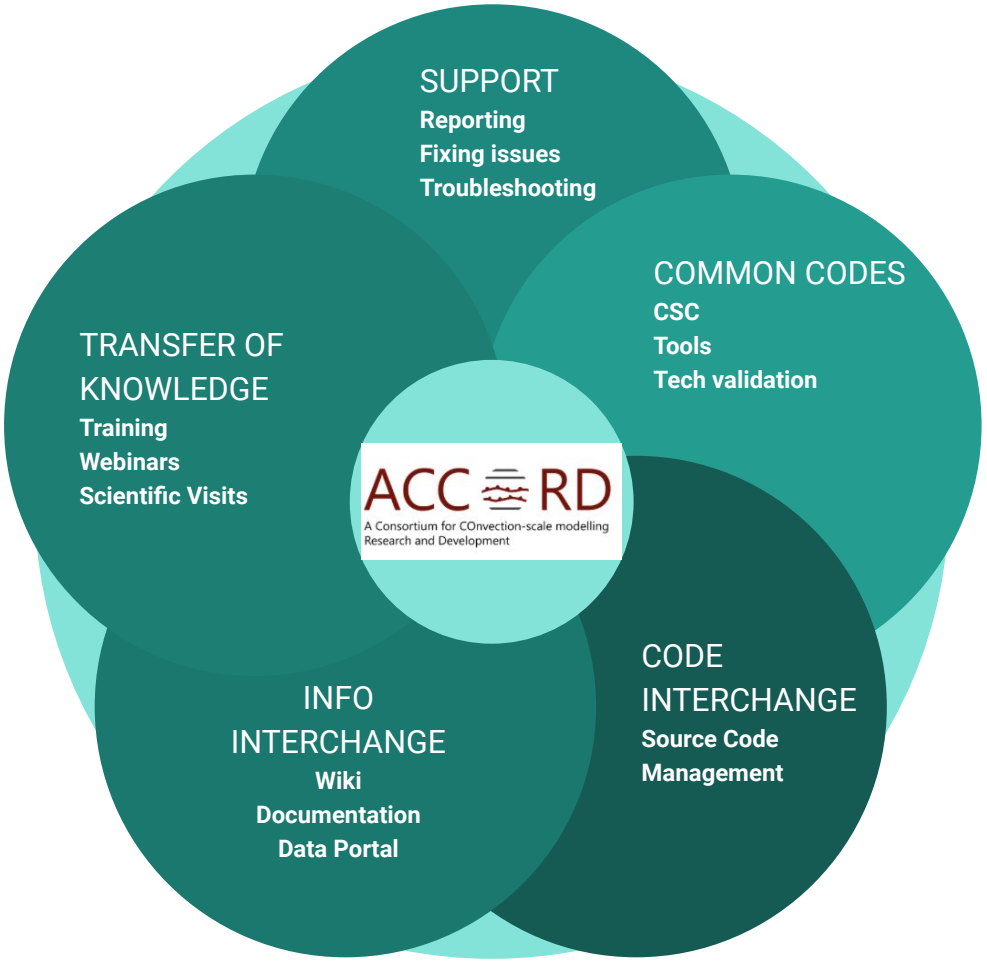
4rd ACCORD ASW,15-19 April 2024, Norrköping and hybrid

Intro

One objective of the ACCORD strategy is to set up a **framework to collaborate more easily** on the codes that we develop, whether it be the **NWP codes or accessory tools to run our models, handle data or any other NWP-related activity**.

Facilitate the research activities to improve the operational weather forecasts

Collaboration



COMMON CODES

3 **Canonical System Configurations** ("CSC"):

Software/code ecosystem

- AROME
- HARMONIE-AROME
- ALARO
- **Separate codes**:SURFEX-NWP oops ectrans fiat …

Tools: harp EPyGrAM AccordDaTools obsmon **…**

Technical code validation: DAVAï **(**DAVAI-env, DAVAI-test, DAVAI-ciboula) , Testbed **…**

Facilitate the research activities

- Share **versions/adaptations**: (op branches, h branches, …)
- All the codes should be considered as **multi/cross platform codes**
  - **DAVAI runs in Belanos and ECMWF**

2 Davai contributors Working Weeks

23 - 27 Nov 2022 at DMI (Copenhagen)

https://github.com/orgs/ACCORD-NWP/teams/system/discussions/1

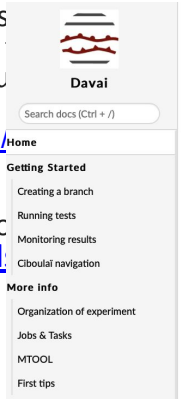
- Necessary changes to add **ALARO test** CY48T3
  - https://github.com/ddegrauwe/DAVAI-tests/tree/degrauwe_48t3_alaro
- **Pseudo Harmonie** test based on CY48T

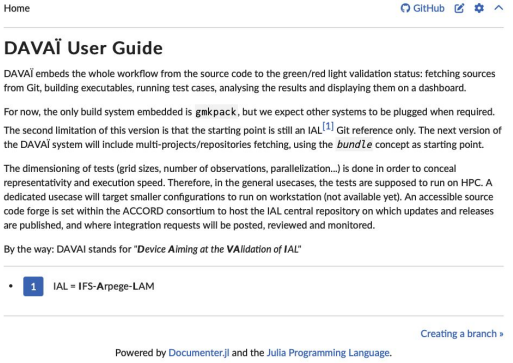
23-27/10/2023 at RMI, Brussels

https://opensource.umr-cnrm.fr/projects/accord/wiki/Davai_Developers_Working_Week_#1

- **Namelist in git repo per CSC**
  - Manipulation in the repo with TNT https://github.com/UMR-CNRM/bronx
  - Namelist handling as deltas or per CSC or per NM
- **Data storage** of the permanent data in cloud for s
- **Portability** to other HPCs, PCs, AWS, compilation
- Move docs from **Latex to MD** and creating a githu

  https://accord-nwp.github.io/DAVAI-env/stable/
- **Data version control** comparison as alternative to
  https://lakefs.io/data-version-control/dvc-tool
  https://git-annex.branchable.com/





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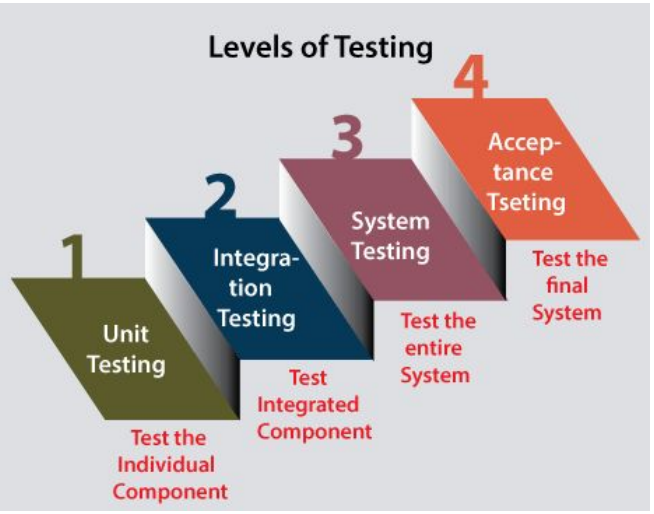
Testing codes



Facilitate the research activities

SPFRACCO ECMWF Special project 2022-2024

1. An enhanced **portability and improved capability** of the code testing tools in ACCORD (**DAVAÏ**).

2. An enhanced definition of **common working practices and work environment for ACCORD** code and system activity, with a strong focus on code integration and technical validation of new cycles.

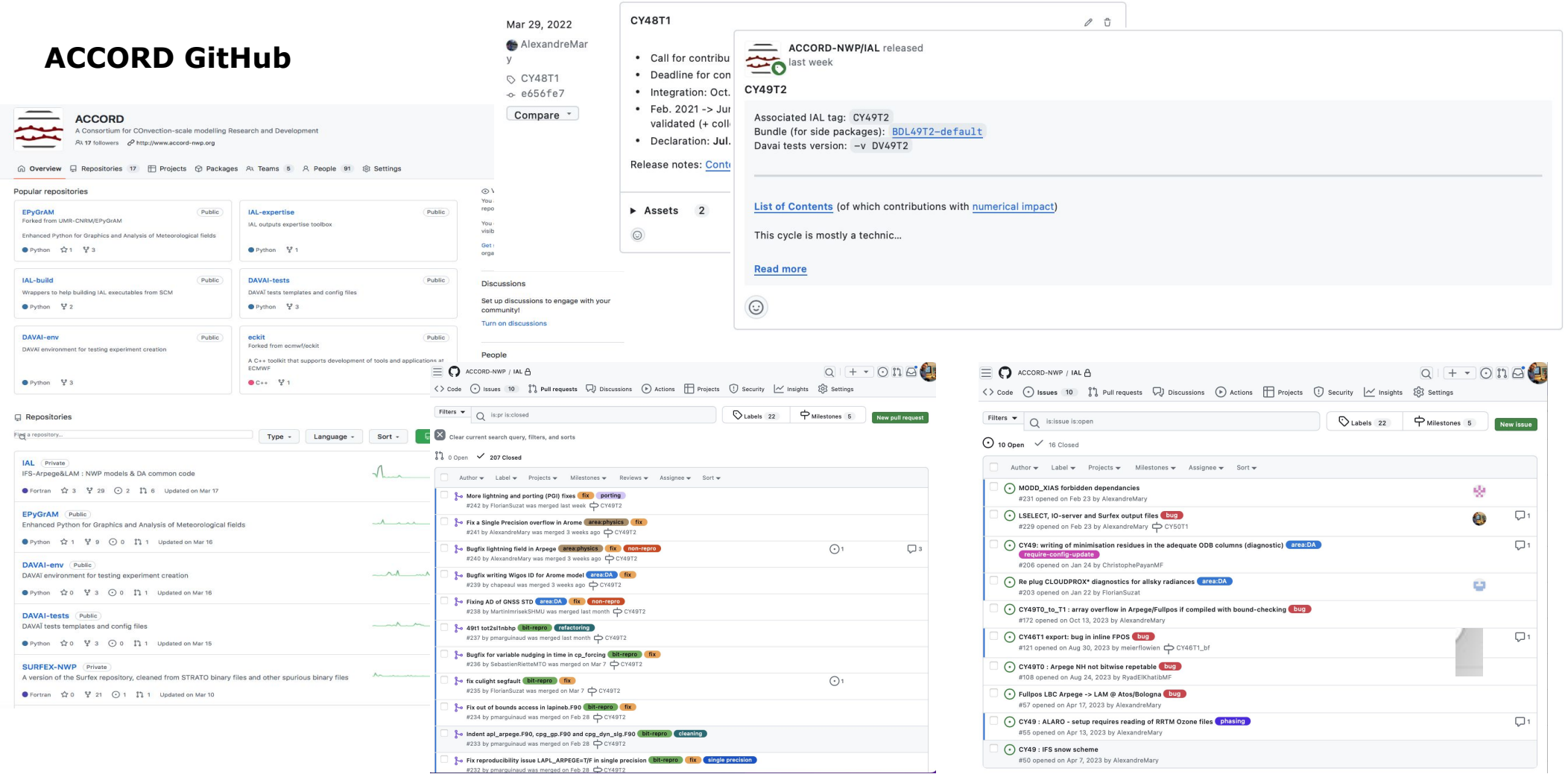
3. An improved **evaluation of the portability of new code** versions for ACCORD Members.

4. Through the additional testing on the ECMWF HPC an **improved technical quality assurance of new cycles**, **with feedback of potential bug-fixes or optimization fixes to the Central Code Repository**

https://www.ecmwf.int/sites/default/files/special_projects/2022/spfracco-2022-request.pdf

CODE INTERCHANGE AND SUPPORT

ACCORD GitHub



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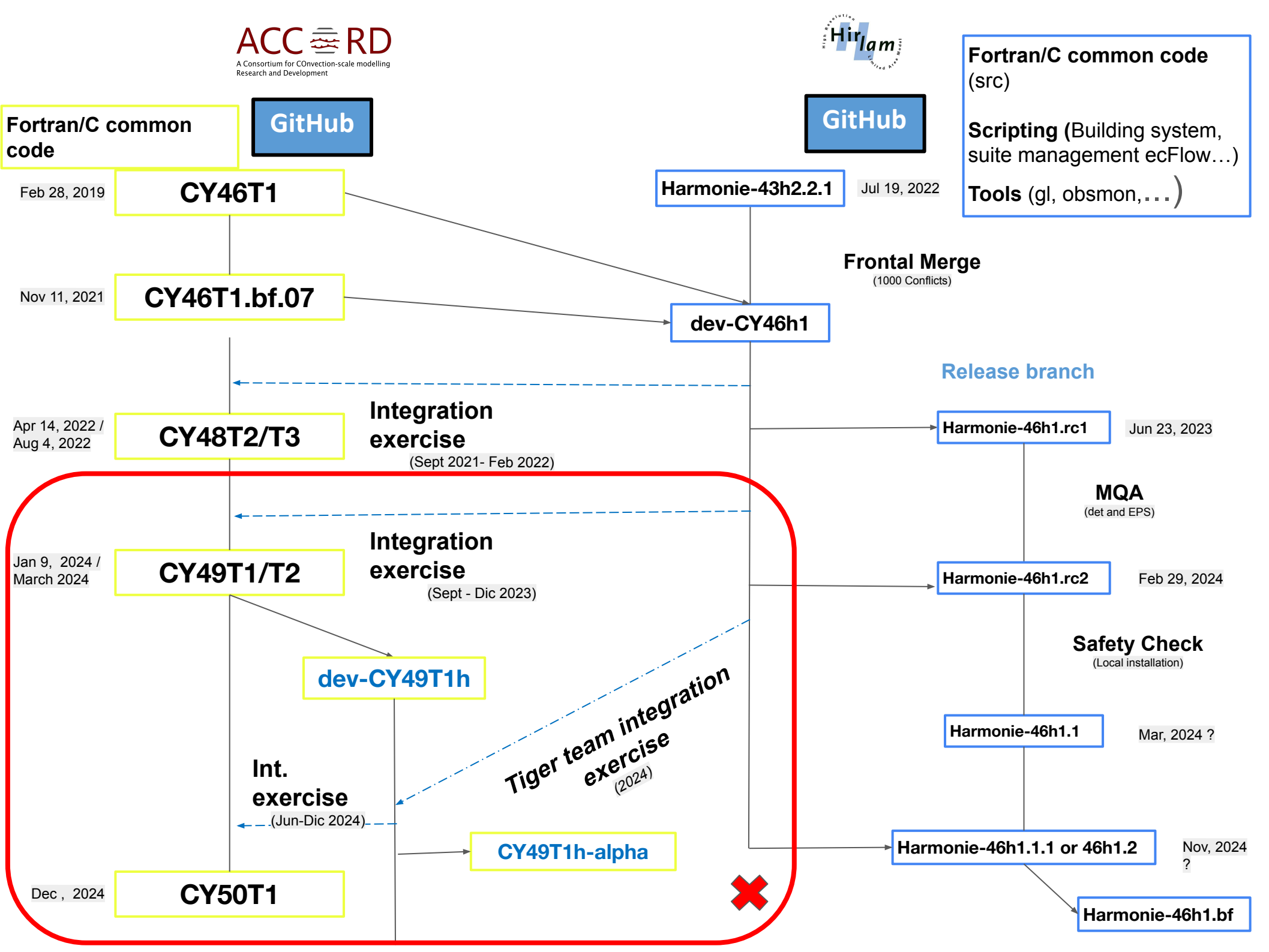
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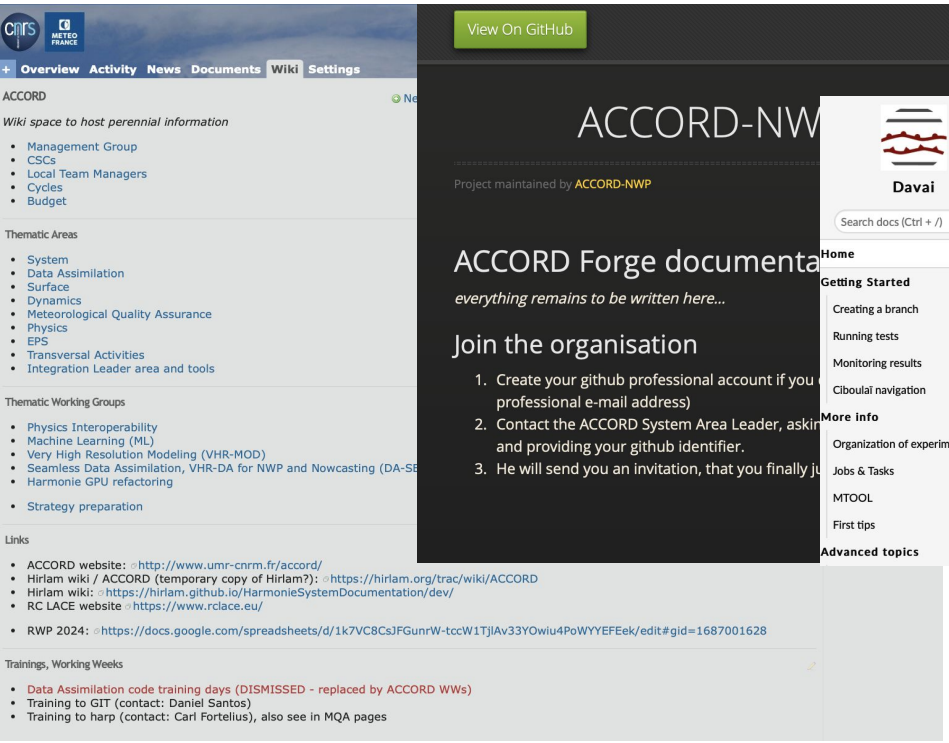
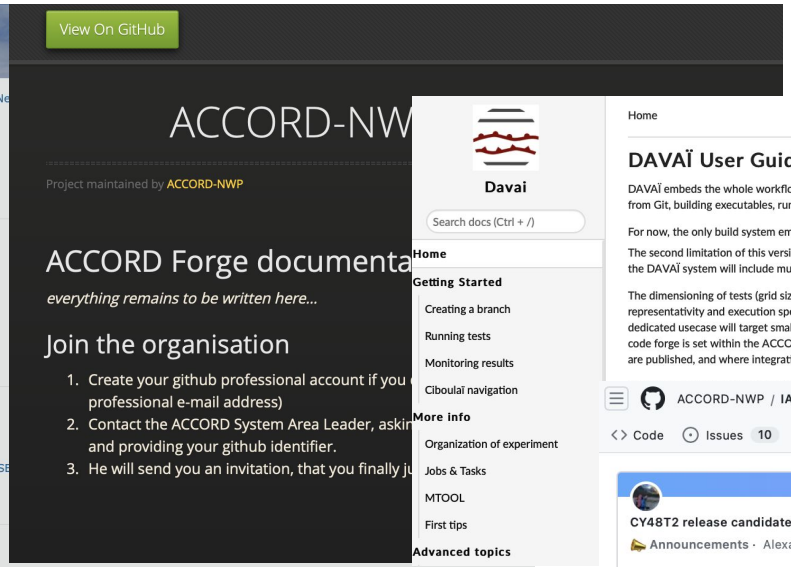
HIRLAM
Fortran/C common code
GitHub
GitHub
Fortran/C common code (src)
Scripting (Building system, suite management ecFlow…)
Tools (gl, obsmon,…)
Feb 28, 2019
CY46T1
Harmonie-43h2.2.1
Jul 19, 2022
Frontal Merge
(1000 Conflicts)
Nov 11, 2021
CY46T1.bf.07
dev-CY46h1
Release branch
Integration exercise
(Sept 2021- Feb 2022)
Apr 14, 2022 / Aug 4, 2022
CY48T2/T3
Harmonie-46h1.rc1
Jun 23, 2023
MQA
(det and EPS)
Integration exercise
(Sept - Dic 2023)
Jan 9, 2024 / March 2024
CY49T1/T2
Harmonie-46h1.rc2
Feb 29, 2024
Safety Check
(Local installation)
dev-CY49T1h
Tiger team integration exercise
(2024)
Harmonie-46h1.1
Mar, 2024 ?
Int. exercise
(Jun-Dic 2024)
CY49T1h-alpha
Harmonie-46h1.1.1 or 46h1.2
Nov, 2024 ?
Dec , 2024
CY50T1
Harmonie-46h1.bf

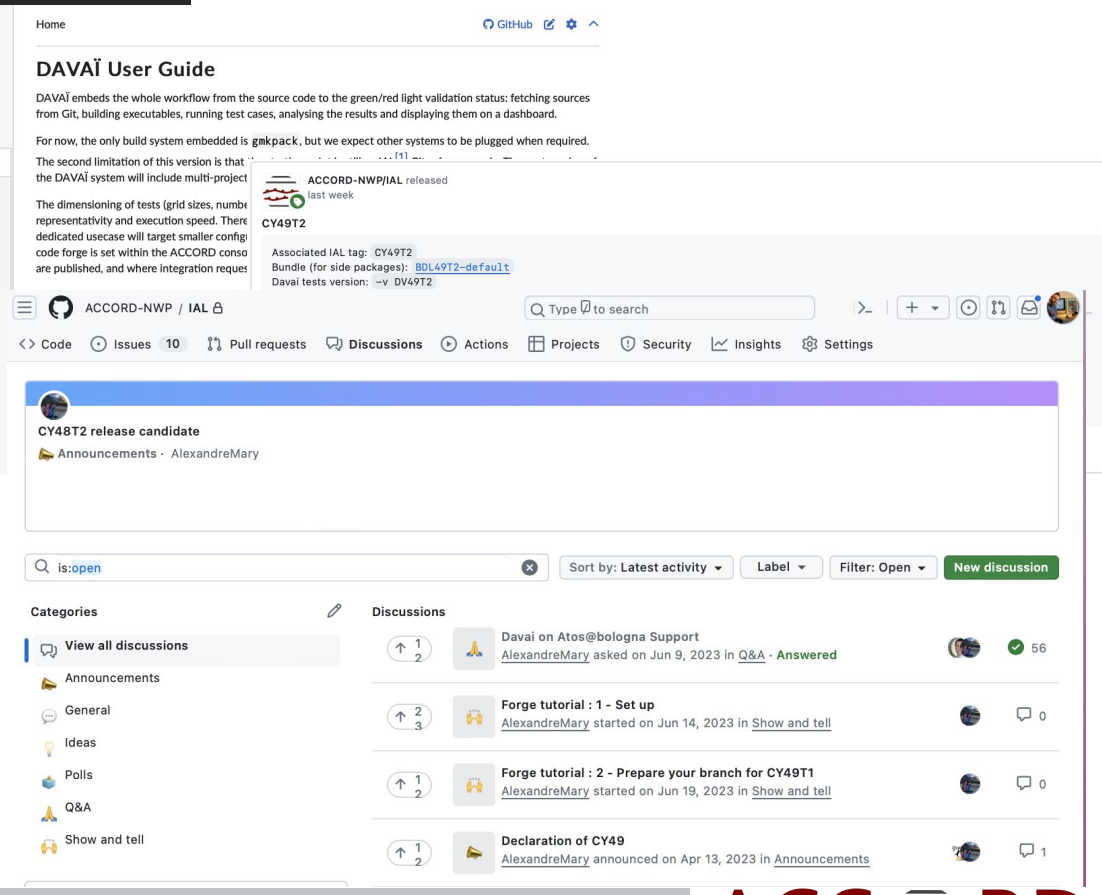
INFO INTERCHANGE

Facilitate the research activities

- Different tools for storing, maintaining and make available the documentation: **DOC OFFICER**







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TRANSFER OF KNOWLEDGE

Facilitate the research activities

GIT :

- GitHub for ACCORD forge
- local support to implement GIT working practices

Git Forge webinar

DAP - Tech support visits for GIT

DAVAÏ:

- Dev working week
- Users training
- Training on ECMWF's HPCF for Davaï testers and integrators (spfracco project)

DAVAÏ training for users webinar

DAP- DAVAÏ contributors-developers WW

Vortex:

- Scientific visit

DAP - Visit to MF

ROAD FROM ECOSYSTEM TO SYSTEM

Software ecosystem

Software/code ecosystem

3 **Canonical System Configurations** ("CSC"):

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Tools: harp EPyGrAM AccordDaTools obsmon …

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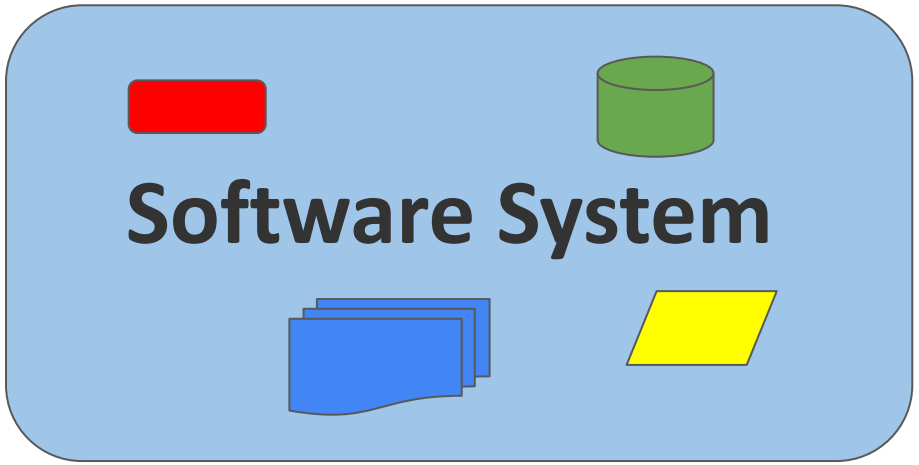
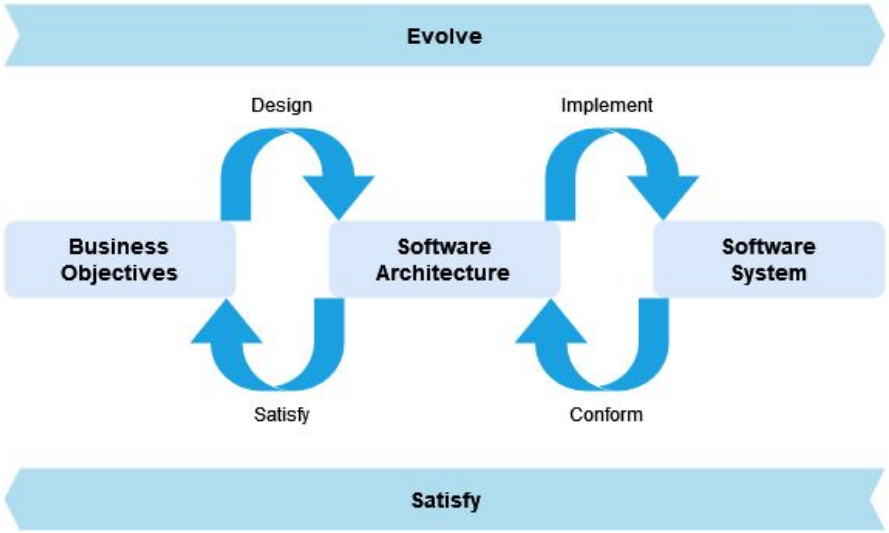
ROAD FROM ECOSYSTEM TO SYSTEM

The software system provides an interface to run the application software.



ROAD FROM ECOSYSTEM TO SYSTEM



Facilitate the research activities

- Ensures an **homogeneous and reproducible environmen**t for research activities and code debugging
- Ensures the **compatibility of a full stack of software** per version
- Ensures a minimum **tested workflow**
- Allows a **local deployment** to ensure the local installation is correct and could be use for research and operations
- Facilitates the **code maintenance** and increases the **code quality** (easier to test)
- Facilitates the **support and troubleshooting**
- Accelerates the research and development
- Increases the **sense of community** and helps to **homogenize the different levels** due to different resources

ROAD FROM ECOSYSTEM TO SYSTEM

Facilitate the research activities

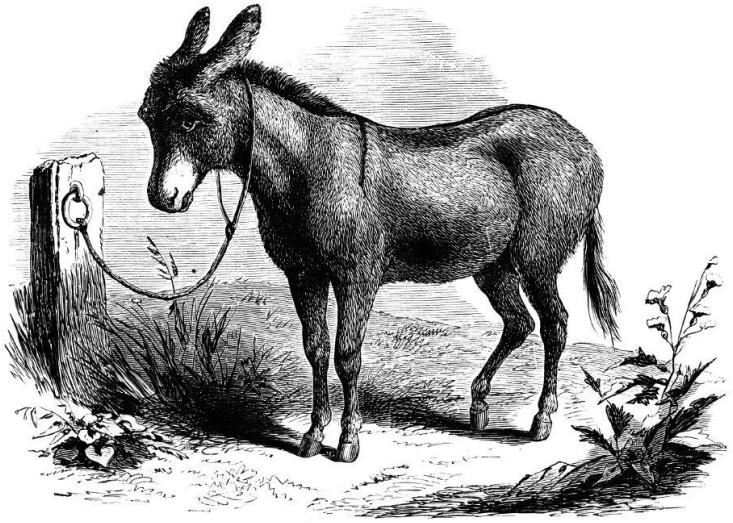
Requires a **consortia effort, mental flexibility and a transition period** from local solutions to a common system.

All the voices should be heard and a **common goal is the key.**

Providing the members an **end-to-end NWP system** in a research mode **is supported by the Assembly**

THANK YOU FOR YOUR ATTENTION

Scripting, software stack and beyond



Excuses for not having a common system

The definitive guide

O'RLY?

Daniel Santos

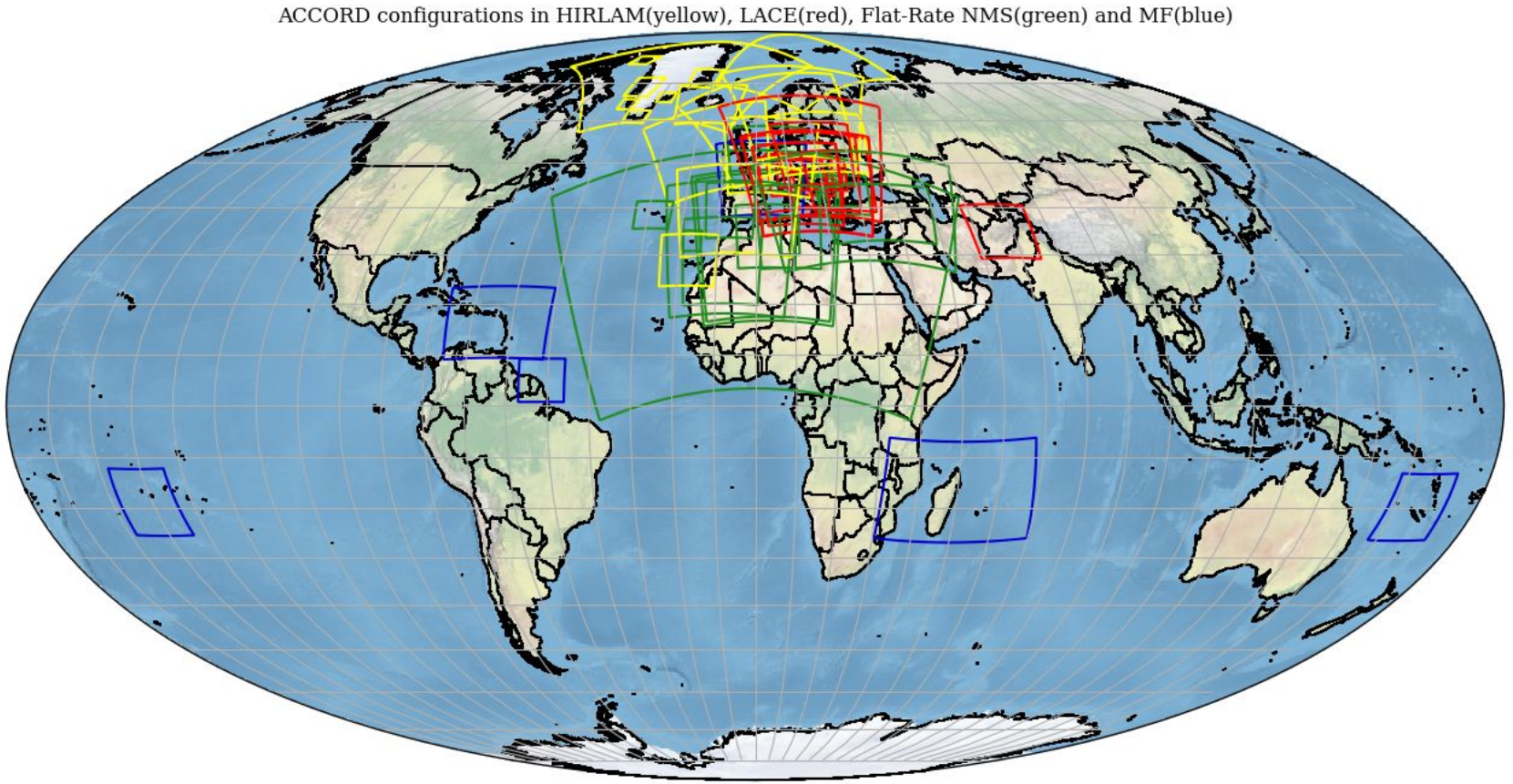
MoU: Article 2: Scope and Objectives

The primary purpose of the Consortium is to share limited resources for the efficient development of a state of the art NWP system and support its operational set up. The Consortium will deliver to its Members a set of common codes that can be assembled under diverse configurations to support the production of world-leading quality numerical weather predictions on limited geographical domains. To this effect, the Consortium will carry out the following activities:

- Research to contribute to the progress of scientific knowledge relevant for short-range weather forecasting, leading to publication of scientific results in the areas of environmental science and high-performance computing;
- Improvement of existing codes or developments of new codes to translate research results into forecasting tools
- Extensive testing to ascertain the technical and meteorological quality of some configurations allowed by the codes (called Canonical System Configurations)
- Regular updates of the scientific and technical documentation of the codes for the benefit of the Members;
- Regular maintenance of the codes in order to increase their efficiency on the latest computing architectures and facilitate their operational use by the Members.

http://www.accord-nwp.org/IMG/pdf/mou_alh_for_signature.pdf

Domains



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- **Text 1**
  - Text 2
    - Text 3
- **Text a bit longer blablabla**
  - Text xxxxx