

# ACCORD

A Consortium for COnvection-scale modelling  
Research and Development

## Evolution of systems in ACCORD: towards a more common and transparent environment

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,

2nd ACCORD ASW, 4-8 April 2022, Ljubljana (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**.

This requires an **evolution of the systems** to achieve a **more common and transparent environment**.

# Collaboration

**Scientific collaboration** can be defined as **interaction** taking place within a social context among two or more **scientists** that **facilitates the sharing of meaning and completion of tasks with respect to a mutually shared, superordinate goal**

<https://asistdl.onlinelibrary.wiley.com/doi/10.1002/aris.2007.1440410121>

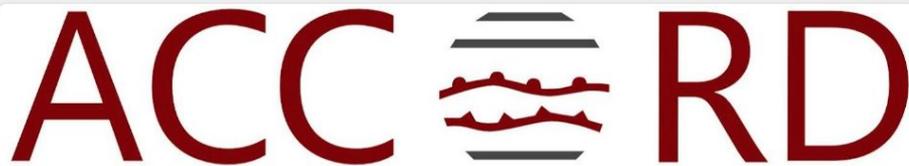
Successful **software projects** require **effective team collaboration across the entire development lifecycle.**

<https://about.gitlab.com/topics/version-control/software-team-collaboration/>

**Digital collaborative environments** play a central role in innovative processes in terms of **connecting different people transparently in order to provide a great diversity of approaches and viewpoints.**

<http://cumin cad.scix.net/data/works/att/70b1.content.pdf>

# Where we are



A Consortium for CONvection-scale modelling

Section 1 of 37

## ACCORD Code Management Questionnaire

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.

In this context, the first step is to inventory what are these tools that we want to share and collaborate on more easily (in addition to the NWP codes), and how they are managed in the teams today, so far.

Hence this questionnaire, to be filled for these tools (including NWP codes). Some extra questions about the scripting and workflow managers have been introduced. You will also be asked about possible training needs in any of the aforementioned aspects.

## ACCORD Code Management Questionnaire.

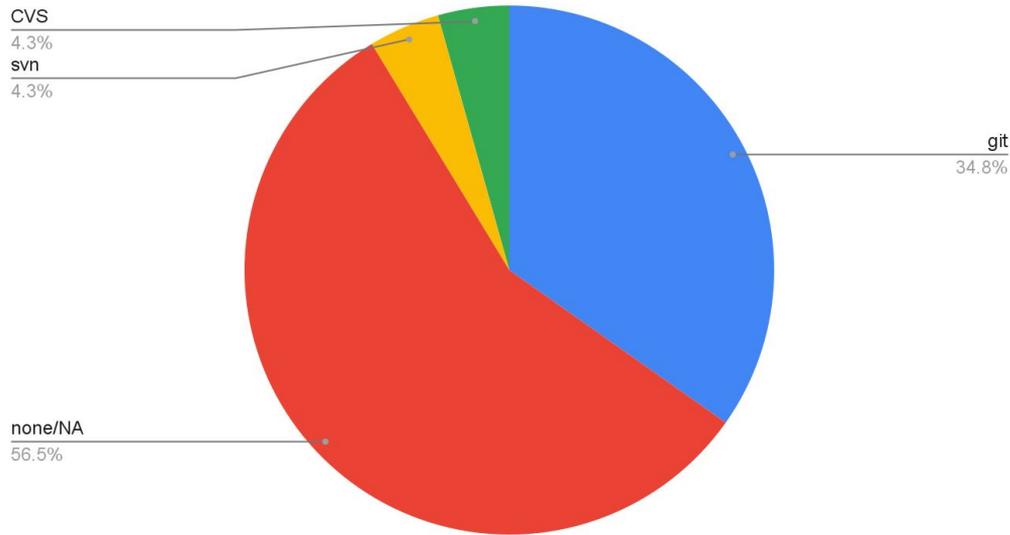
The quiz addressed some **extra questions** about the **scripting, workflow managers**, possible **training** needs, future **code development techniques ...**

## 23 ACCORDers answered

The **red color** always represents **no/none/NA** in the graphs

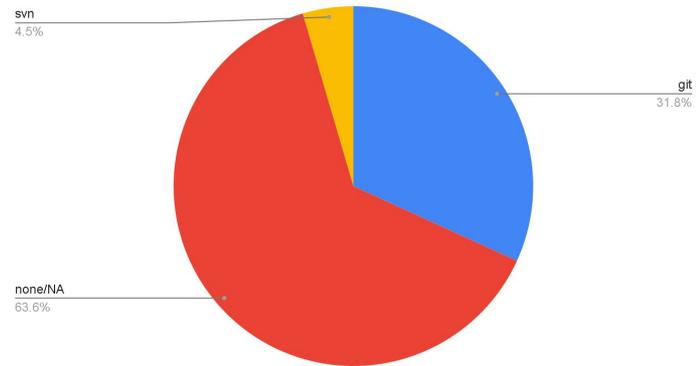
# Source Code Management

SCM for NWP-CSC codes



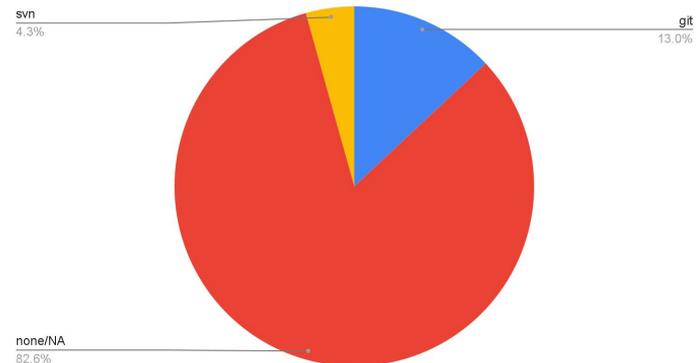
**NWP-CSC codes**  
Git (35%)

Scripting SCM



**Scripting**  
Git (32%)

Local NWP adaptations SCM



**Local NWP adaptations**  
Git (11%)

# ACCORD GitHub prototype

Search or jump to... Pulls Issues Marketplace Explore

**ACCORD**  
A Consortium for COnvection-scale modelling Research and Development  
<http://www.accord-nwp.org> Follow

Overview Repositories 10 Packages People 20 Teams 4 Projects Settings

Pinned Customize your public pins

**ACCORD-NWP doesn't have any pinned public repositories yet.**

Repositories

Find a repository...

Type Language Sort New

**DAVAI-tests** Public  
DAVAI tests templates and config files  
Python ☆ 0 🍴 1 🔄 0 📄 0 Updated 19 days ago

**OOPS-configs** Private  
OOPS config files  
☆ 0 🍴 0 🔄 0 📄 0 Updated 19 days ago

People Invite someone

Top languages  
Fortran Python C++ Jupyter Notebook

**EPyGrAM** Public  
Enhanced Python for Graphics and Analysis of Meteorological fields  
Jupyter Notebook ☆ 0 🍴 4 🔄 0 📄 0 Updated 25 days ago

**IAL** Private  
IFS-Arpege&LAM : NWP models & DA common code  
Fortran ☆ 1 🍴 8 🔄 0 📄 1 Updated 29 days ago

**oops** Private  
Object Oriented Prediction System (clone of EC's repo)  
C++ ☆ 0 🍴 Apache-2.0 🍴 0 🔄 0 📄 0 Updated on 23 Feb

# ACCORD GitHub prototype

Search or jump to... Pull requests Issues Marketplace Explore

ACCORD-NWP / IAL Private Unwatch 1 Fork 8 Star 1

Code Issues Pull requests 1 Discussions Actions Projects 2 Security Insights Settings

master 5 branches 10 tags Go to file Add file Code

About IFS-Arpege&LAM : NWP models & DA common code 1 star 1 watching 8 forks

Releases 1 CY48T1 Latest 6 days ago

Languages Fortran 93.1% C 3.7% C++ 1.2% Shell 0.8% Python 0.4% Perl 0.3% Other 0.5%

Folder	Commit Message	Time Ago
aeolus	bugfix for single precision	2 years ago
aladin	eslextpolad_obs new routine	10 months ago
algor	Correct KIND Changeset 422e63 Correct KIND in algor/module/ra...	16 months ago
arpifs	Fixes (on behalf REK):	9 months ago
biper	modifications from olda and fabrice for pre CY47 (some ryad modi...	3 years ago
blacklist	Merge whelane_CY48_T1cib.01_HirlamNewBatorChanges	10 months ago
cmake	Add ECMWF physics branch.	2 years ago
coupling	NHQE bugfixes; Switch to v102017 of MITRAILLETTE	5 years ago
crm	Add project "crm": super-parametrizationi of cloud resolving mod...	4 years ago
ecftw/module	Pre-version of cycle CY46R1 .	3 years ago
etrans	Fix LFI and spectral transforms for libs4py:	13 months ago
ifsaux	Merge branch 'napolya_CY48_dbprepgauss'	9 months ago
ifsobs	Pre-version of cycle CY47R1 .	2 years ago
mpa	Merge branch 'sokka_CY48_EPS_SPP'	9 months ago
mse	Merge branch 'khatib_CY48_T1cib.04%misc'	13 months ago
obstat	Pre-version of cycle CY47R1 .	2 years ago
odb	Merge branch 'suzat_CY48_T1validation'	9 months ago
oops_src/src	Fix date handling for 4DnVar in model tl/ad	2 years ago

# ACCORD GitHub prototype

dsantasm / IAL (Private)  
forked from ACCORD-NWP/IAL

Watch 0 Fork 9 Star 0

Code Pull requests Actions Projects Security Insights Settings

master 5 branches 10 tags

This branch is up to date with ACCORD-NWP/IAL:master. Contribute Fetch upstream

AlexandreMary Fixes (on behalf REK): e656fe7 on 1 Jul 2021 2,183 commits

Branch	Description	Time
aeolus	bugfix for single precision	2 years ago
aladin	eslextpolad_obs new routine	10 months ago
algor	Correct KIND Changeset 422e63 Correct KIND in algor/module/ra...	16 months ago
arpifs	Fixes (on behalf REK):	9 months ago
biper	modifications from olda and fabrice for pre CY47 (some ryad modi...	3 years ago
blacklist	Merge whelane_CY48_T1cib.01_HirlamNewBatorChanges	10 months ago
cmake	Add ECMWF physics branch.	2 years ago
coupling	NHQE bugfixes; Switch to v102017 of MITRAILLETTE	5 years ago
crm	Add project "crm": super-parametrizationi of cloud resolving mod...	4 years ago
ecftw/module	Pre-version of cycle CY46R1 .	3 years ago
etrans	Fix LFI and spectral transforms for libs4py:	13 months ago
ifsaux	Merge branch 'napolya_CY48_dbprepgauss'	9 months ago
ifsobs	Pre-version of cycle CY47R1 .	2 years ago
mpa	Merge branch 'sokka_CY48_EPS_SPP'	9 months ago
mse	Merge branch 'khatib_CY48_T1cib.04%misc'	13 months ago

**About**  
IFS-Arpege&LAM : NWP models & DA common code  
0 stars  
0 watching  
9 forks

**Releases**  
10 tags  
Create a new release

**Packages**  
No packages published  
Publish your first package

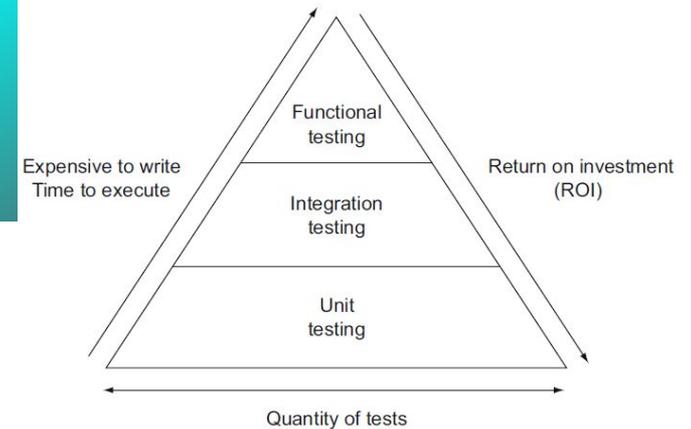
**Languages**

- Fortran 93.1%
- C 3.7%
- C++ 1.2%
- Shell 0.8%
- Python 0.4%
- Perl 0.3%
- Other 0.5%

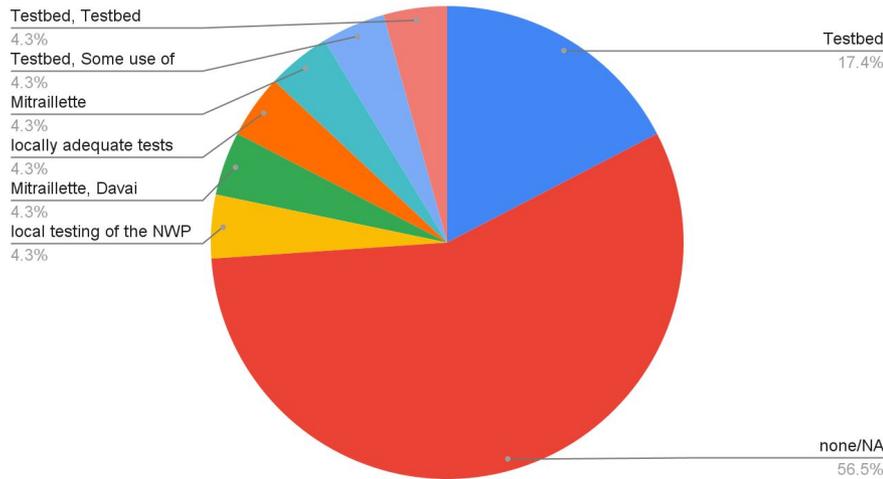
# ACCORD GitHub prototype

The screenshot shows a GitHub pull request page for the repository 'ACCORD-NWP / IAL'. The pull request is titled 'Pre-externalised FA-LFI #4' and is from user 'AlexandreMary'. The 'Pull requests' tab in the navigation bar is circled in red. The pull request description states: 'This branch reorganizes FA & LFI formats, so that they are ready for externalisation, provided externalisation of fiat.' It lists several issues that remain: 'grib\_api\_interface.F90', 'qsortc.F', 'fi\_libc.c & .h', 'iswap8.c', and 'LFA4py & transforms4py have not been touched yet.' It also mentions questions about 'LFI\_PRECISION' and 'SDL\_SRLABORT', and notes that 'entry points for libs4py in gmpack have been moved.' The pull request includes a list of 6 commits: 'FA: porting fixes', 'Reorganization of LFI library within ifsaux/falfi/', 'Reorganization of FA library within ifsaux/falfi/', and 'FA-LFI : add cmake directives & tests embryo'. The right sidebar shows 'Reviewers' (No reviews), 'Assignees' (AlexandreMary), 'Labels' (enhancement), 'Projects' (CY49T1 integration), and 'Milestone' (CY49T1).

# Testing codes



Testing NWP-CSC codes



**NWP-CSC**  
Testbed(26%)

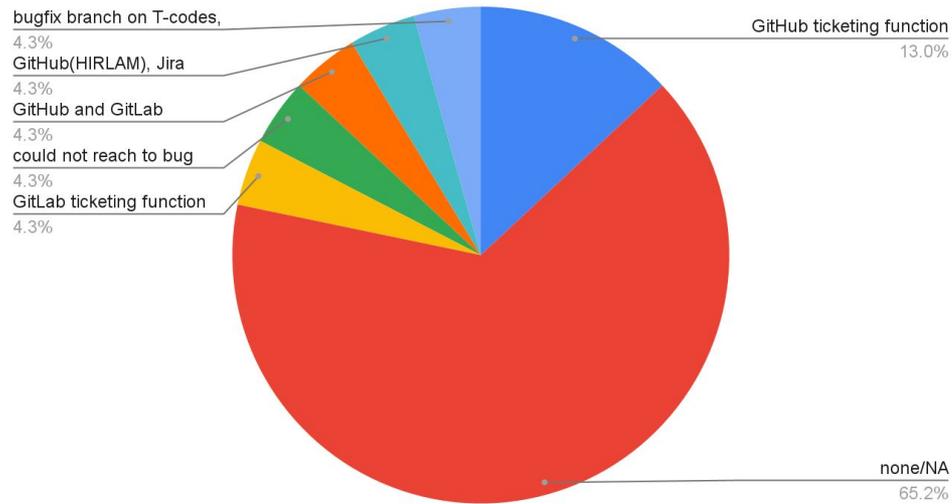
## SPFRACCO ECMWF Special project 2022-2024

1. An enhanced **portability and improved capability** of the code testing tools in ACCORD (**DAVAI**).
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](https://www.ecmwf.int/sites/default/files/special_projects/2022/spfracco-2022-request.pdf)

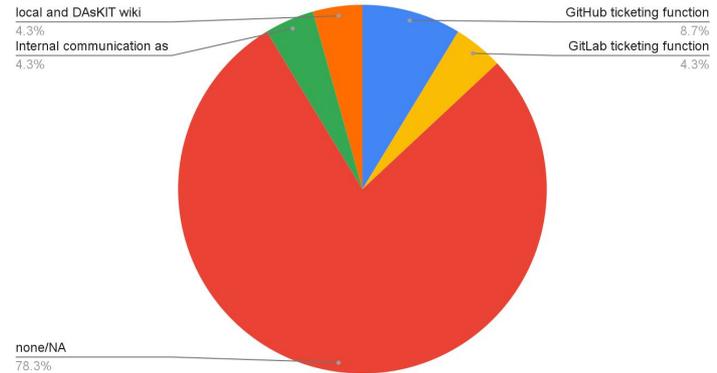
# Tickets

Tickets NWP-CSC codes



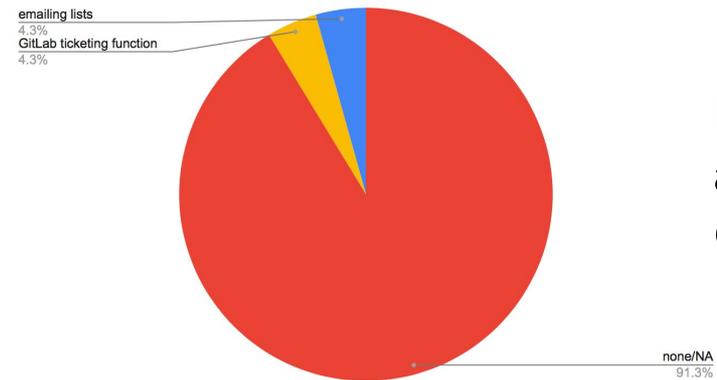
**NWP-CSC  
GitHub issues (23%)**

Scripting Ticketing



**Scripting  
GitHub  
ticketing  
(9%)**

Local NWP ticketing



**Local NWP  
adaptations  
GitLab(5%)**

# ACCORD GitHub prototype

Search or jump to... Pull requests Issues Marketplace Explore

ACCORD-NWP / IAL Private

Unwatch 1 Fork 9 Star 1

<> Code **Issues** Pull requests 1 Discussions Actions Projects 2 Security Insights Settings

Filters is:issue is:open Labels 9 Milestones 3 New issue

0 Open 0 Closed Author Label Projects Milestones Assignee Sort

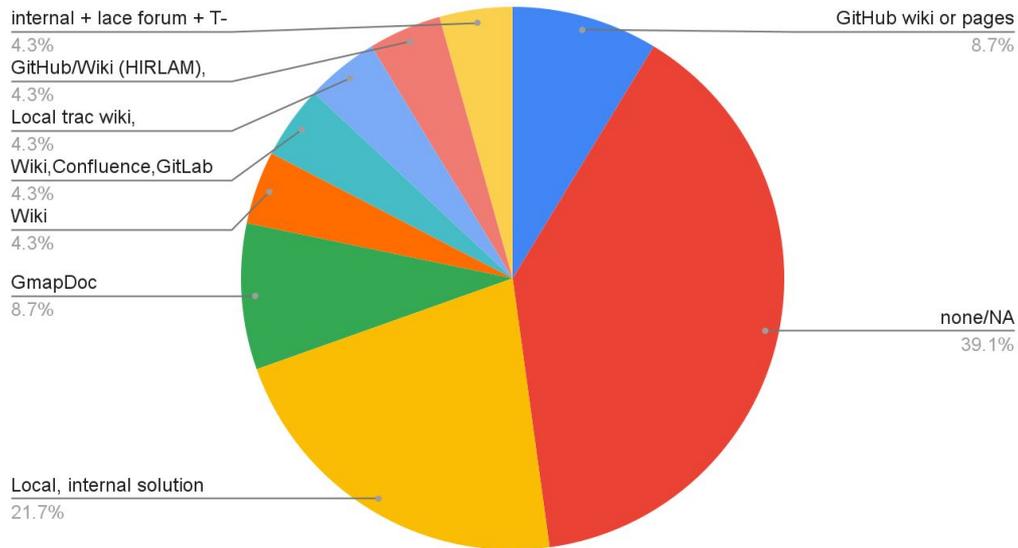
There aren't any open issues.

You could search [all of GitHub](#) or try an [advanced search](#).

**ProTip!** Type `g p` on any issue or pull request to go back to the pull request listing page.

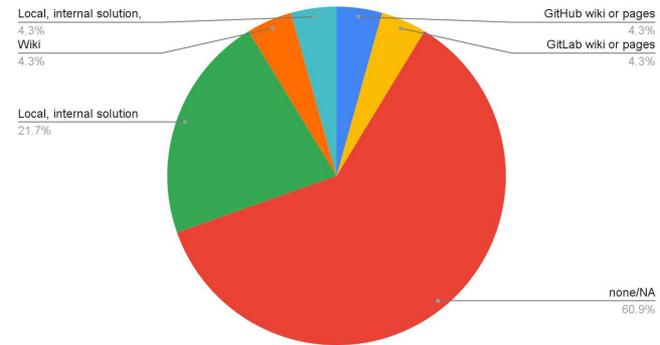
# Docs

Docs NWP-CSC codes



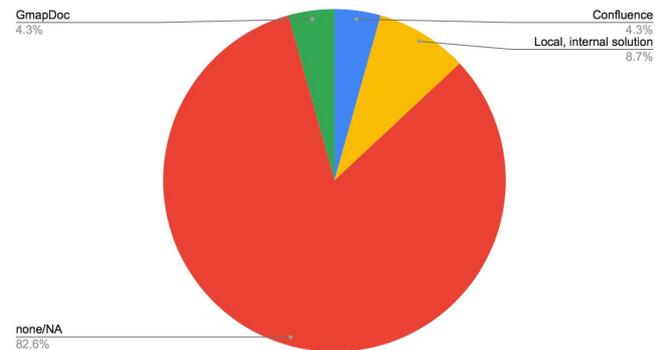
**NWP-CSC Codes**  
 Local solution (22%)  
 Private (65%)

Scripting Docs



**Scripting**  
 Local solution (21%)

Local NWP docs



**Local NWP adaptations**  
 Local internal solution (9%)

# Levels of documentation

## CODE DOCUMENTATION

- 0) **Inside code and print outs and error messages**
  - Integration rules ..
- 1) **Technical evolution of code content**
  - pull request, release notes, tech validation results ...
- 2) **Practical guidance on how to use new features**
  - how to, README, commented namelist, examples, tutorials ...

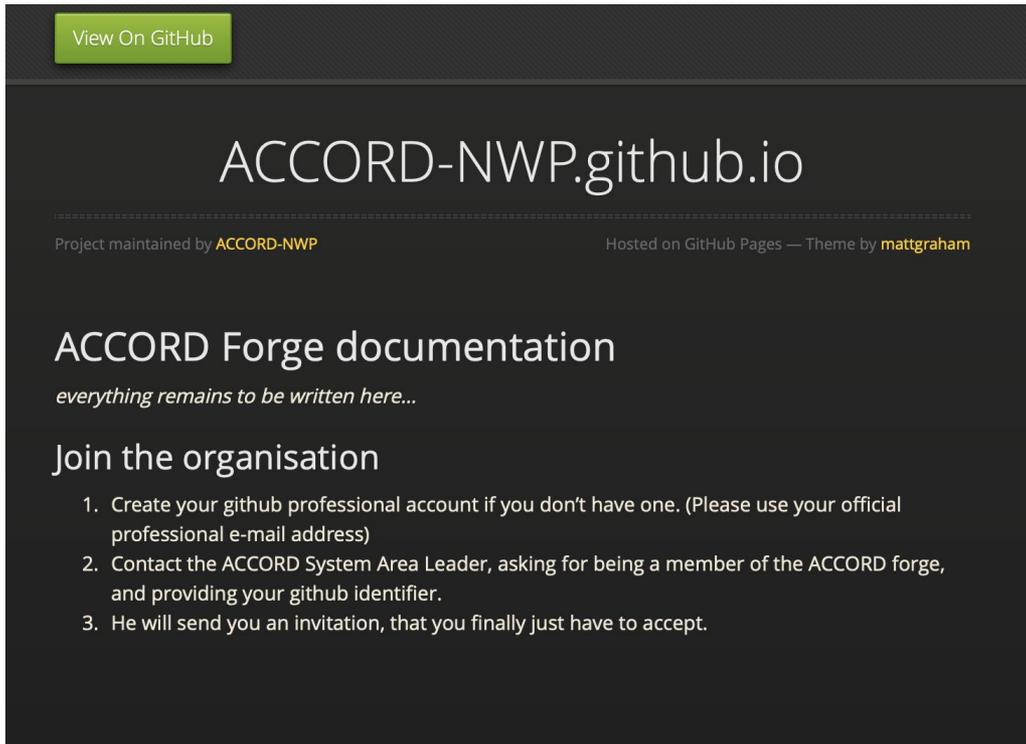
## SCIENTIFIC DOCUMENTATION

- newsletters, reports, papers, exp results, met validation summary...

## MODEL DOCUMENTATION

- equations, used in the code, algorithm explanation...

# ACCORD GitHub prototype



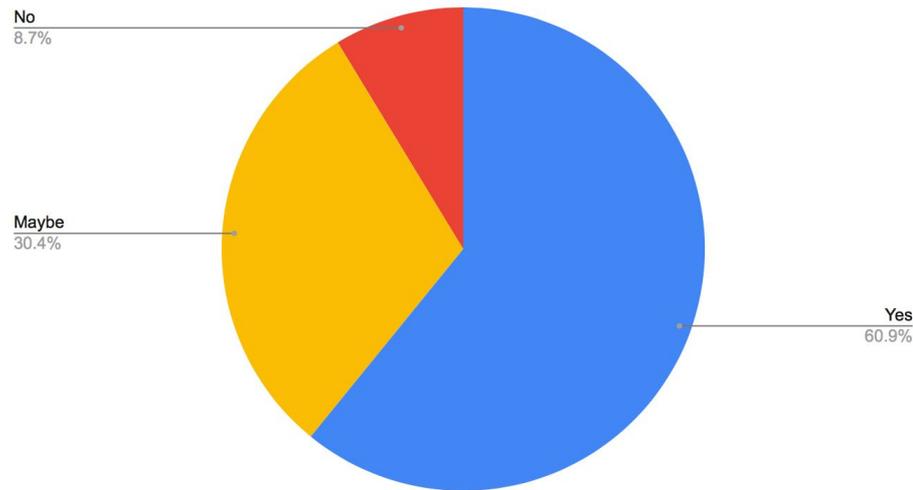
The screenshot shows a dark-themed GitHub page for 'ACCORD-NWP.github.io'. At the top left is a green button that says 'View On GitHub'. The main heading is 'ACCORD-NWP.github.io'. Below it, there are two lines of smaller text: 'Project maintained by ACCORD-NWP' and 'Hosted on GitHub Pages — Theme by mattgraham'. The main content area has a heading 'ACCORD Forge documentation' followed by the italicized text 'everything remains to be written here...'. Below that is a section titled 'Join the organisation' with a numbered list of three steps: 1. Create your github professional account if you don't have one. (Please use your official professional e-mail address) 2. Contact the ACCORD System Area Leader, asking for being a member of the ACCORD forge, and providing your github identifier. 3. He will send you an invitation, that you finally just have to accept.

## Ten simple rules for documenting scientific software

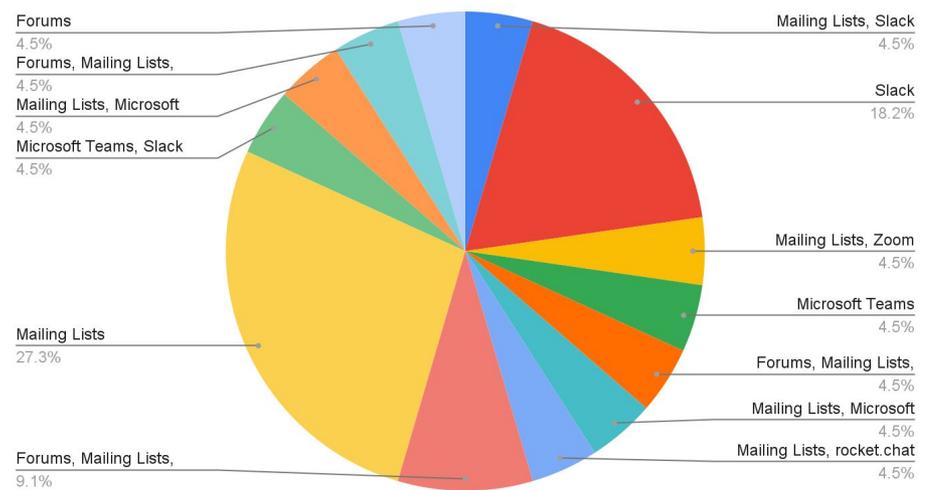
- to be as close as possible to the code versions
- should be version controlled
- automatic generation tools
- error link to docs...

# Training and communication

Training



Communication



Training (61%) and Communication (???)

# ACCORD LTSR

“**Local Team System Representatives (LTSR)**” will try to ensure the **fluidity of the exchange of information and opinions** between the various NMSs and ACCORD, allowing **all voices and requirements to be heard**.

- Create a forum where we would achieve a **fluid exchange of information**,
- Prepare **training actions** so that there is a **transfer of knowledge** in this area.

This action can help **the system area to have a stronger presence in the ACCORDers**.

# ACCORD GitHub prototype

Search or jump to... Pull requests Issues Marketplace Explore

ACCORD-NWP / IAL (Private) Unwatch 1 Fork 9 Star 1

Code Issues Pull requests 1 **Discussions** Actions Projects 2 Security Insights Settings

Announcements  
**CY48T2 release candidate**  
AlexandreMary

Search all discussions New Top: All Label Filter New discussion

Categories Discussions

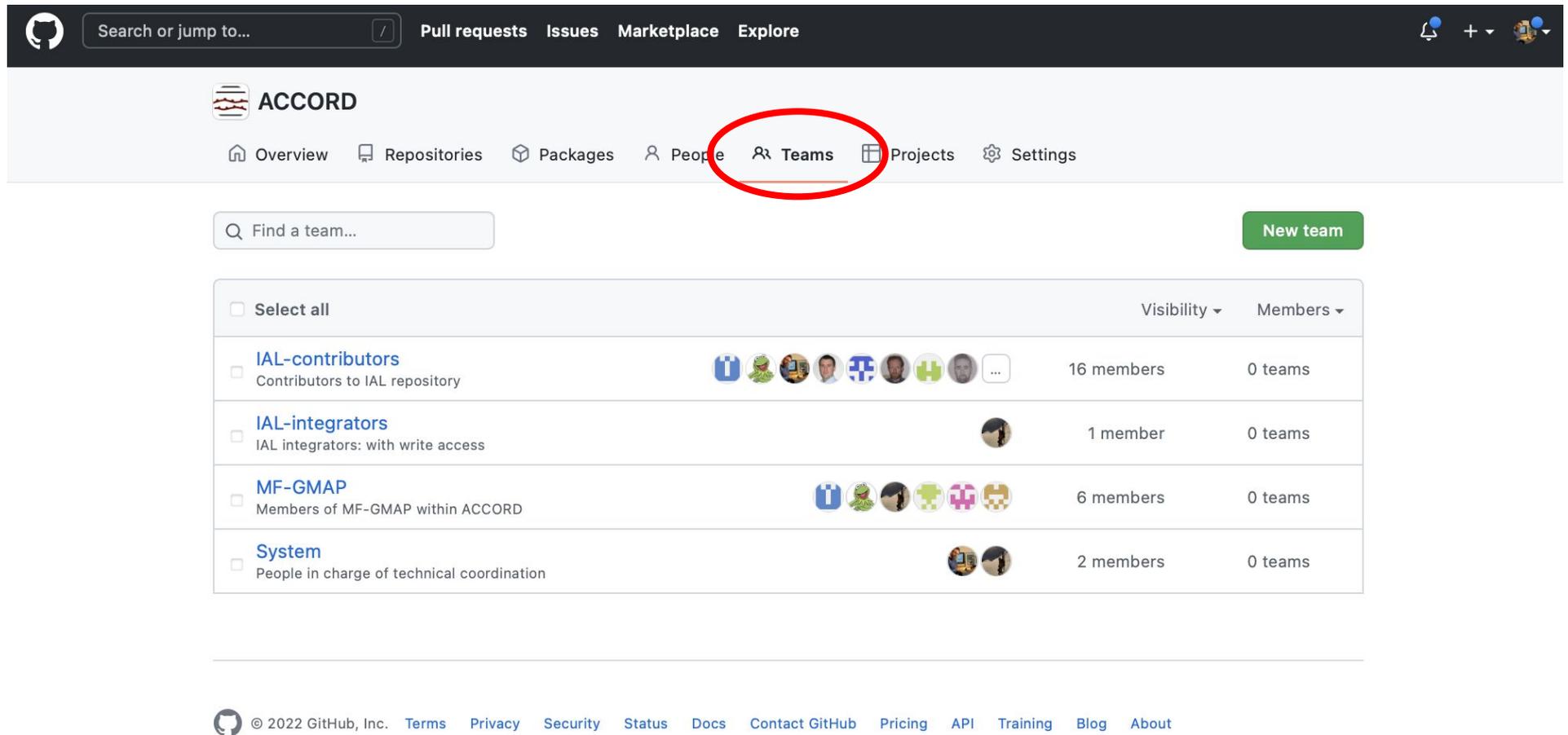
View all

- Announcements
- General
- Ideas
- Q&A
- Show and tell

**Most helpful**  
Be sure to mark someone's comment as an answer if it helps you resolve your question — they deserve the credit! ❤️

Community guidelines  
Community insights

# ACCORD GitHub prototype

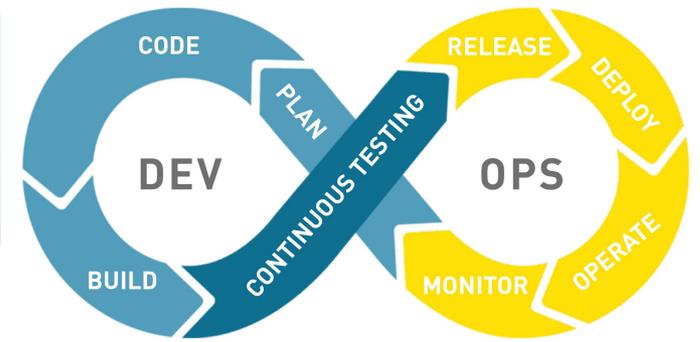


The screenshot shows the GitHub interface for the ACCORD repository. The 'Teams' tab is highlighted with a red circle. Below the navigation bar, there is a search box for teams and a 'New team' button. A table lists the existing teams with their member counts and team counts.

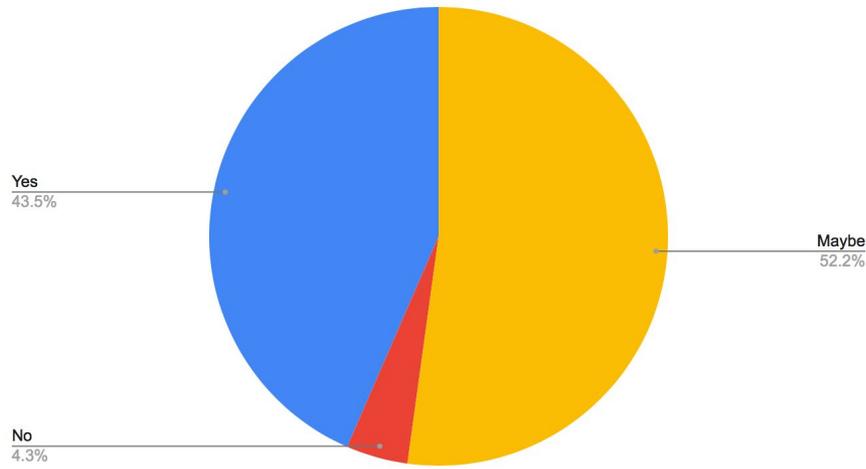
<input type="checkbox"/> Select all	Visibility ▾	Members ▾
<input type="checkbox"/> <b>IAL-contributors</b> Contributors to IAL repository		16 members 0 teams
<input type="checkbox"/> <b>IAL-integrators</b> IAL integrators: with write access		1 member 0 teams
<input type="checkbox"/> <b>MF-GMAP</b> Members of MF-GMAP within ACCORD		6 members 0 teams
<input type="checkbox"/> <b>System</b> People in charge of technical coordination		2 members 0 teams

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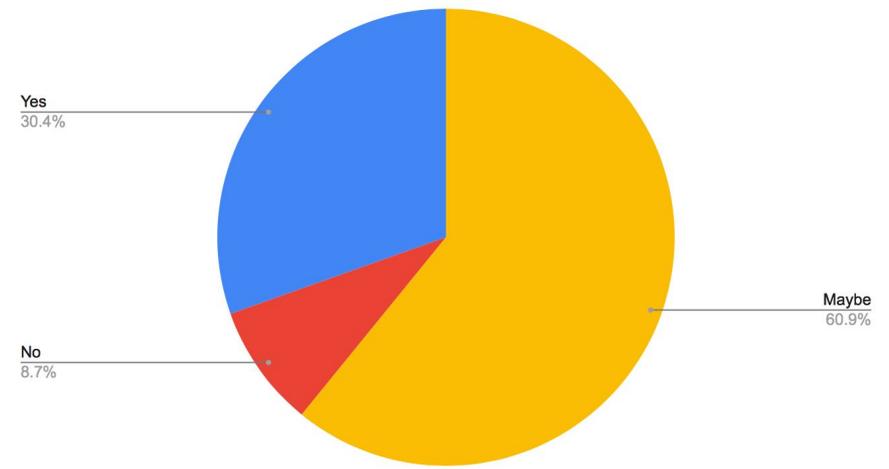
# CI & CD



Continuous integration



Continuous deployment



Continuous Integration (44%) Continuous Deployment (30%)

# Summary and conclusions from the quiz

**GIT** is the mainly SCM but a great group of ACCORDers are not use any SCM

**Cloud solution** for **NWP-CSC** codes, **local solution** for **Scripting and Local NWP adaptations**

**SCMs** are mainly used for NWP-CSC, less for SCRIPTING and, in a few cases, for local NWP adaptations.

**Docs in local private solutions** mainly and **ticketing is not generally used**

**Training** is really needed

**Communication inhomogeneity**

**CI is considered** in general but **CD is not short term objective**

# Training action plan

## ACCORD Forge

- **Training** on **GIT** solution and associated working practices
  - Branching
  - Pull request and revision process
  - Ticketing
  - Bug fixing
  - Bundling tool
- Promote use of **GIT** for:
  - Scripting
  - Local adaptation
  - Associated NWP Tools
- Code testing with Davaï (**spfracco**)
  - Towards Continuous Integration

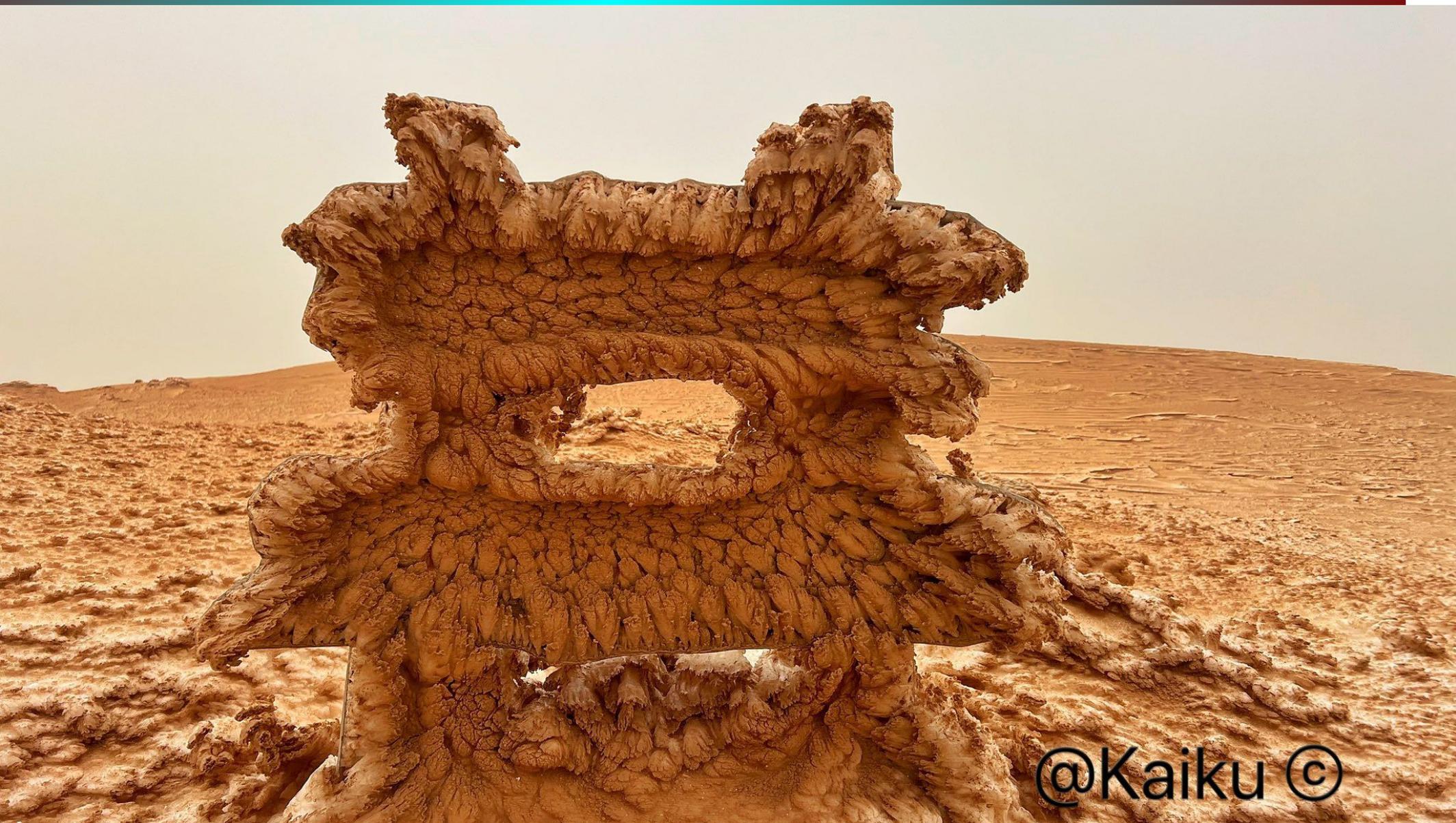
**Git Forge webinar**

**DAP -  
Tech support visits for  
GIT transfer of  
knowledge**

**DAVAï training for  
users webinar**

**DAP DAVAï  
contributors-developers  
WW**

# Thank you for your attention



@Kaiku ©

The ...



is in Alexandre's talk

# 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.

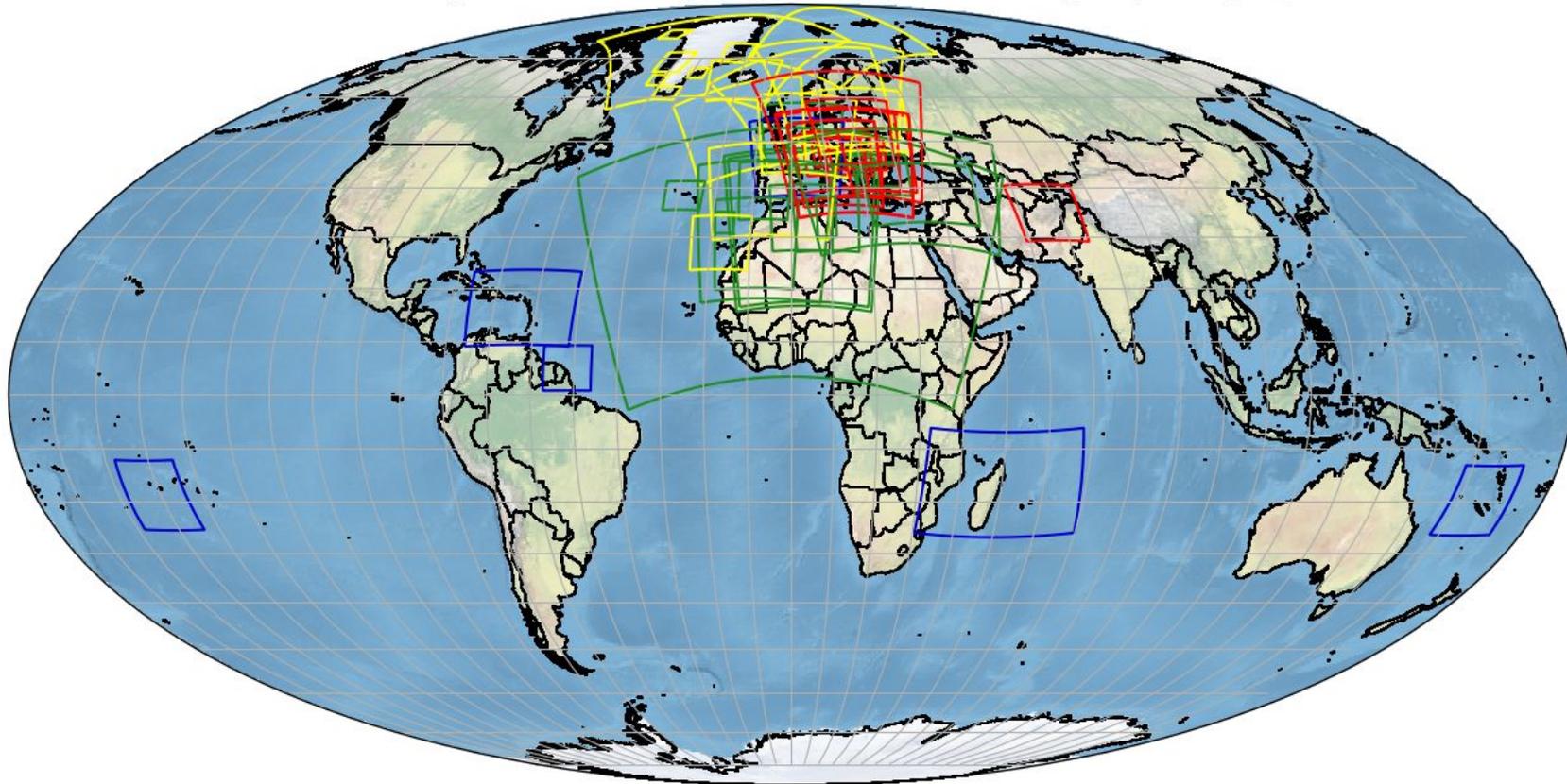
[http://www.accord-nwp.org/IMG/pdf/mou\\_alh\\_for\\_signature.pdf](http://www.accord-nwp.org/IMG/pdf/mou_alh_for_signature.pdf)

[1] The full ACCORD NWP system is currently being developed along 3 main model configurations, the so-called **Canonical System Configurations** ("CSC"):

- AROME (see <https://gmd.copernicus.org/articles/11/257/2018/gmd-11-257-2018.pdf>)
- HARMONIE-AROME (see <http://journals.ametsoc.org/doi/abs/10.1175/MWR-D-16-0417.1>)
- ALARO (see <https://gmd.copernicus.org/articles/11/257/2018/gmd-11-257-2018.pdf>)

# Domains

ACCORD configurations in HIRLAM(yellow), LACE(red), Flat-Rate NMS(green) and MF(blue)



# Titre

- **Text 1**

- Text 2

- Text 3

- **Text a bit longer blablaba**

- Text xxxxx