



1st ACCORD STAC meeting
Tuesday 4 May 2021
14:00-18:00
visio-conference

Minutes

Participants

Flat-Rate ALADIN MoU5 Representatives	Rafiq Hamdi (Belgium)
	Ilian Gospodinov (Bulgaria)
	Vanda Costa (Portugal)
RC-LACE-MoU5 Representatives	Yong Wang (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	Peter Bauer
Invited experts and CSC Leaders	Eric Bazile, AROME CSC leader Jørn Kristiansen Jeanette Onvlee (HARMONIE-AROME CSC leader) Piet Termonia (Area Leader for Transversal Activities) Martina Tudor (ALARO CSC leader)

1. Opening and introduction virtual tour de table

Saji (STAC chair) opened the meeting and invited all participants to take the floor and present themselves. Patricia will prepare a photo gallery of the STAC members (see Annex II).

2. Adoption of the draft agenda

The agenda is unanimously adopted.

3. Brief introductions to

Saji explained that following the Assembly demand, the ACCORD PAC met on the 31st of March and discussed the questions asked by the Assembly:

- What are the potential benefits of DestinE for ACCORD? What could be the risks or drawbacks ?
- What is the potential impact of DestinE on the ACCORD strategy ?
- What are the consequences of DestinE on the ACCORD work plans ?
- How can ACCORD contribute? How can DestinE become relevant for ACCORD ?

The PAC provided its recommendations and tasked a WG to prepare an “outline paper of what ACCORD could consider for DestinE”. This note has been handed over to the STAC and the Management Group (MG).

a) Destination Earth Initiative

Claude introduced the DestinE LAM¹ as a step change in service level, production and technology:

- Customized, on-demand, easy-to-access, extreme-event driven services
- Forecasts: hyper-resolution model coupled with impact-based model, event/user-driven post-processing, use of high-resolution observations, enhanced NWP production by ML encouraged
- Implement LAM Digital Twin in DestinE infrastructure
- Specific on-demand LAM functionality to be designed
- DestinE will use Euro-HPC facilities => demonstrate that codes can run on mixed pre-exascale HPC

The timeline for the DestinE phase 1 is very tight (call for tender to be issued in July and bids to be submitted in September, proof of concept of operational readiness at the end of 2023 while the work should start on existing HPC until exascale HPC facilities open).

a) Outline note (asked by PAC)

Claude then gave a preliminary outline of the possible content of a DestinE-LAM proposal and summarized the outline note prepared by the PAC Working Group:

- Hyper-resolution NWP LAM (100-200m?) coupled with global extreme event DT (IFS)
- Complemented by impact-based model (hydrology – flooding -, coastal surges, air quality, etc.)
- Flexible configurations: relocatable with options or set of pre-defined domains? coarse grid / fine grid; degrees of freedom for on-demand by the user should stay reasonable
- Use observations especially of high density; expose with simulated data
- Specific surface fields adaptation (SURFEX-based)
- Data assimilation for phase 1? upper-air (if HR obs?) or surface or none?
- No EPS in phase 1; how about uncertainty quantification?
- Profit from the extremely huge amount of data stored on the data lakes ... motivation for addressing ML/DL approaches in research?

Claude reported on the remarks made by the ACCORD MG on the outline note on three levels:

- Governance-type: no operational goal for ACCORD; membership issues (Digital Europe); recruitment an issue?
- Technology & operational readiness: carefully provision resources for all technology aspects in phase 1 (only then development) and timeliness requirement?
- Impact-based: hydrology models usually fine-tuned for specific area (not easy to relocate); use potential of SURFEX in-core modules (eg. urban modelling TEB)

a) Link with RWP & Strategy of ACCORD

Claude explained that [the ACCORD Strategy 2021-2025](#) was adopted in 2020 and presented the main achievements expected from ACCORD before the end of 2025. The general structure of the [Rolling Work Plan 2021](#) is derived from this Strategy and, with respect to the RWP2020. Its content has been significantly adapted to strengthen the work on mid-term specific objectives while not sacrificing steady progress in the long term goals described in the Strategy 2021-2025.

2. Discussion &

3. Discussion on recommendations

Saji thanked Claude for his very clear presentation and opened the floor to discuss DestinE-LAM in the context of ACCORD, its impact on the ACCORD strategy and how ACCORD can contribute.

On one hand, **DestinE-LAM goes beyond the ACCORD strategy**, i.e. for impact based models and applications or running at hectometric scales (Martina); on the other hand, some DestinE-LAM requirements are already in the ACCORD Strategy and **DestinE-LAM could be a unique opportunity for the ACCORD community** to boost the developments on these parts of the Strategy:

- in areas or Work Packages where ACCORD have a small activity due to the little expertise of the teams or small staffing, for instance SPTR1 “addressing future evolutions of software infrastructure” or HR1 “sub-km modelling” (Sami, Xiaohua);

¹ General information on DestinE can be found [on the EU website](#) and on the ECMWF Seminars such as “How the EC's DestinE programme transforms environmental policy making - Digital twins as a step-change for Earth-system modelling and data assimilation” (recording available: <https://events.ecmwf.int/event/234/>)

- for SPTR1, the ACCORD strategy is to focus on separation of concerns (Atlas and DSL). ACCORD could benefit from additional staff to accelerate the reformulation of the code for GPU (Piet);
- DestinE would also be the opportunity for advanced testing of SURFEX, i.e. TEB for urban modelling (Rafiq), thus very-high resolution observations in cities would be needed, placing a high-demand on physiography data in our models (Jeanette);
- DestinE will give a high visibility to ACCORD (Kristian).

ACCORD could have to recalibrate its strategy in the future as:

- DestinE shows the direction of the future developments of the global community and ACCORD will have to adapt its LAM strategy to this global strategy (Yong);
- whether ACCORD Members participate in DestinE or not, DestinE will have an impact on the codes ACCORD shares with ECMWF (Alain);
- the operational aspects in DestinE and some technological ones are outside of the ACCORD scope. However DestinE could accelerate the code adaptation efforts to new HPC architectures following the separation of concerns approach (ie not only GPU) (Claude);
- not all the science needed from NWP for DestinE is available yet (Sami) but Horizon Europe offers opportunities for funding further research (Saji).

According to Peter, **the role ACCORD can play in DestinE-LAM is not prescribed by DestinE.** ACCORD should define what is relevant at LAM scale for DestinE.. Peter also underlined that DestinE should be considered as a whole, with global, LAM and climate components working together with huge resources available at the end. In the preparation for DestinE, the discussions with the Euro-HPC JU are starting on HPC access for testing and production, with already some individual discussions with CINECA and CSC. DestinE will apply to enter the Strategic Projects access class of Euro-HPC. An implementation plan that covers all aspects of all DT (Digital Twin) options (global and LAM Extremes, Climate) and that ideally involves the most relevant HPC centres in DE, FR, ES, IT, FI should be produced. Some global benchmark figures exist and **Peter invited ACCORD to help shape a LAM benchmark** and address questions which are still open (benchmark with GPU capability or extrapolations from CPU-only figures? 100 meters resolution or extrapolation from higher resolution? Which architecture for estimating the LAM benchmark figures? ...).

Alain pointed that the “on-demand and configurable” requirements should be translated into concrete terms to enable figuring out numbers for computing time request. On-demand and configurable may not be relevant in some configurations (i.e. configurable domain and data assimilation, or configurable domain and use of a hydrological model, ..). The STAC Members raised additional questions to be addressed: what is reasonable to offer as impact based, what configurations could be offered, uncertainty assessments (EPS?), what are the constraints of on-demand systems (i.e. making the DA configuration suitable for on-demand running), what are the technological constraints (the prototype developed for DestinE phase 1 should run operationally at the beginning of phase 2) ...

Peter invited ACCORD to help clarify what makes sense in terms of configurable and on-demand requirements.

Claude proposed to task a drafting team to prepare a set of questions to address to ECMWF (perhaps also EUMETSAT or ESA) on the future requirements of the call.

The STAC agreed and asked that this drafting team also provide guidance on what ACCORD members could provide for DestinE-LAM in phase 1, ensuring the balance between ambition and feasibility, with an outlook on phases 2-3. The drafting team will use the outline note prepared by the PAC Working Group and prepare an augmented version.

This augmented note would also help eligible² ACCORD Members to decide if they want to enter the future DestinE-LAM bidding partnership (Claude could use this note as a guideline to discuss with the LTMs).

² Depending on their national position with respect to EU and Euro-HPC project, not all ACCORD Members can be involved in DestinE.

The STAC tasked the drafting team to analyse specific questions in this note, in order to provide guidance for the bidding partnership: understand what “on-demand” means, consequences on choices of impact-based models (based on examples), points of attention regarding interfacing and integration into DestinE infrastructure (system aspects), code adaptation and separation of concerns, hyper-resolution modelling, data assimilation (versus relocatable domains), EPS (uncertainty quantification), use of high resolution observations and evaluation of quality. The drafting team will look into possibilities and evaluate their consequences on ACCORD work and teams (from what is already in the ACCORD Strategy and Work Plans). It will provide comments on further realistic ambitions to the bidding team who will prepare the ACCORD-based proposal to DestinE-LAM.

François proposed that the drafting team should analyse the relations and interactions between the DestinE-LAM partnership and ACCORD and the risks of divergence (some DestinE deliverables might be incompatible with ACCORD objectives). Saji added that the benefits of the DestinE project should be shared among the ACCORD members, irrespective of their participation in the project and, in the spirit of ACCORD consortium and any risks should be mitigated. A risk analysis should be performed by the drafting team along the redaction.

Sami proposed that an advisory board of the DestinE-LAM project would be formed in the context of DestinE, where ACCORD should be represented, in order to mitigate risks.

The STAC unanimously recommended that the ACCORD members consider participating in the DestinE project. The shape of the DestinE-LAM proposal and the future work, if the bid is successful, should benefit all ACCORD Members.

STAC proposed that a Drafting Team is formed to prepare an augmented content note on DestinE-LAM.

The STAC agreed on the composition of the drafting team: PM, STAC chair, one representative from each ACCORD family (this representative could be chosen among the STAC or MG members or any other person of the family who can provide input on the relevant questions). STAC Flat-Rate Members nominated **Piet to represent the Flat-Rate members** (Piet also is AL for transversal activities). **The STAC members of the 3 other families (HIRLAM, LACE, MF) will nominate their representative by Friday, 7th May.** **The STAC agreed on the mandate of the drafting team** (as discussed above and summarized in the ToR of the drafting team in Annex I).

Saji will check with the Chairs of Assembly and PAC if they agree with the STAC recommendations and immediate implementation of the recommended actions. **Subject to approval by the Bureau (meeting on the 7th of May), the drafting team should start working on the 10th of May and deliver the augmented note by 31st May.**

4. Read out recommendations and actions

Claude orally summarised the agreed recommendations and actions. Due to lack of time, it was not possible to finalize the text of these recommendations and actions during the meeting. By the following day, Saji, Claude and Patricia proposed a draft of this text for the STAC members to agree on it by email exchanges. *A draft text was distributed on the 5th of May and the agreed version is provided in Annex I.*

5. Date of the next STAC meeting

Claude explained that the STAC will meet next in the autumn to review the RWP2021 and provide recommendations on the RWP2022. This meeting should take place about one month before the Assembly meeting. The date of the 2nd STAC meeting will thus be decided when the Assembly decides on the date of their end-of-the-year meeting.

6. AOB

None.

7. Closing

Saji thanked the STAC members and the invited experts for the fruitful discussions during the meeting and closed the meeting at 18:00.

Annex I : STAC recommendations and actions

STAC finds significant benefits for ACCORD from the DestinE project and recommends that the ACCORD members should consider participating in the project.

STAC recommends that the benefits of the DestinE project should be shared among the ACCORD members irrespective of their participation in the project.

In order to enhance the uptake of benefits arising DestinE and to mitigate related risks, STAC recommends that the bidding partnership considers forming a Project Advisory Board, involving ACCORD consortium representatives.

STAC proposes that a Drafting Team is formed to prepare an augmented content note on DestinE-LAM.

The PM will use the augmented content note to brief the LTMs on DestinE-LAM and facilitate a kick-off discussion among the possible bidding partners.

Composition of the STAC drafting team is proposed as: PM, STAC chair, representatives from the 4 families: Piet as Area co-Leader for Transversal activities and representing the Flat-Rate members; the STAC members of the 3 other families (HIRLAM, LACE, MF) each nominate one member for the drafting team (STAC or MG members or others) from their family who can both represent their family and provide input on the relevant questions, by Friday, 7th May.

Deliverable: an augmented content note will be made available to all STAC members.

Timeline: 3 weeks

ToR of the drafting team:

- The drafting team will address the questions raised at STAC which require further discussions with Peter Bauer or other teams of the DestinE Initiative (ECMWF, perhaps EUMETSAT or ESA) on the future requirements of the call.
- It will analyse specific questions in order to provide guidance for the future bidding partnership: understand what “on-demand” means, consequences on choices of post-processing and impact-based models (based on examples), points of attention regarding interfacing and integration into DestinE infrastructure (system aspects), code adaptation and separation of concerns, hyper-resolution modelling, data assimilation (versus relocatable domains), EPS (uncertainty quantification), use of high resolution observations and evaluation of quality.
- The drafting team will provide views on the balance between ambition and feasibility (for phase 1). It will further provide an outlook proposal of what ACCORD members could provide to DestinE in phases 2-3.
- The team will prepare the augmented content note, including a risk analysis and proposals for mitigation. The content note is not intended to contain a description of the ACCORD-based proposal (this is the task of the bidding consortium) but as a guidance material for the bidding partners.

Annex II : trombinoscope³ (on-line photo-gallery)

This photo gallery was prepared from screen prints mainly taken during the 1st STAC meeting.

Scientific and Technical Advisory Committee (STAC)

Flat-Rate ALADIN MoU5 Members



Rafiq Hamdi
(Belgium)

Ilian Gospodinov
(Bulgaria)

Vanda Costa
(Portugal)

Météo-France



STAC vice Chair

Alain Joly
(France)

Christina Lac
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François Bouyssel
(France)

HIRLAM-C Members



STAC Chair
Saji Varghese
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RC-LACE-MoU5 Members



Yong Wang
(Austria)

Kristian Horvath
(Croatia)

Simona Tascu
(Romania)

ACCORD Program Manager



Claude Fischer
(France)

ECMWF Observer



Peter Bauer

³ We introduce this French popular word, meaning “photo gallery with faces”

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