Applications and Verification

Work Plan

Prepared by:	Area Leader Doina-Simona Tașcu	
Period:	2022	
Date:	March 2022	

Introduction and background

The main activities within the “Applications and Verification” area are to collect information and identify LACE members needs and create an action plan to systematically manage, organize and control the changes in the software codes. Furthermore, to maintain a documentary fund which should help the NWP colleagues.

Goals

The primary goal is to develop and adapt/use different specific applications into user-friendly mode. Many tools and software products were developed along the years for meteorological parameters. These days, it is imperative to have easy to use applications, maybe to find and to identify the operational activities, to make a common way for saving time and manpower resources. Nowadays, it is important to make the applications easy to implement without too much cost and to make a common way for saving time, computer costs and manpower. It is a big challenge to identify and to merge all the beneficial technical approaches and applications for all countries.

Main R&D activities

It is well known that the verification of numerical model is an important tool in order to ensure a better use of the meteorological products for the operational and research usage. The main activities are the following:

- HARP implementation and verification for deterministic and probabilistic forecasts
- HARP linked to OPLACE database
- Multiple verification methods
- Panelification
- Post-processing of model output
- RC-LACE egitlab platform
- Database of cases
- Trainings

1 Action: HARP implementation and verification for deterministic and probabilistic forecasts

Description and objectives: Despite the fact that many efforts were involved along the years within RC-LACE in the development of LAEF verification, the development of it can be considered frozen for the moment. The main idea is that each member should start to use the HARP common tool.

Proposed contributors: Christoph Zingerle (1.75 pm)

2 Action: HARP linked to OPLACE database

Description and objectives: At the last LSC meeting most participants mentioned the importance of using OPLACE database as input for HARP verification. An interface was already created in order to link HARP to OPLACE database. For a first step, the new obsoul format is adapted. In case that the old format is still needed, the work can continue on this. Further investigations will be made in order to decide if is necessary to have separated historical OPLACE database or we should take into consideration to have in one country one storage devoted for a very long archive.

Proposed contributors: -

3 Action: Multiple verification methods

Validation of AROME SEKF (Simplified Extended Kalman filter)

In **Hungary**, from 15 November 2021, an AROME-TEST parallel suite was launched for a month. Simplified extended Kalman filter (SEKF) was applied in the test run for surface assimilation. The results were evaluated and compared to the operational AROME/HU forecasts in which optimum interpolation (OI-main) is used for surface data assimilation. The work is ongoing and the plan is to make an additional verification campaign in May 2022.

Proposed contributor*: Boglárka Tóth (0.25 pm)*

Panelification

Description and objectives: This topic was started in Austria also for precipitation verification and visualization. The idea was to calculate a number of scores and present them together with the visualized field, such that humans can quickly have a look at the fields and the scores in one single place. It also comes with some rankings, but those are to be taken with a grain of salt. The special thing is that it verifies against our INCA Analysis, which means we get a gridded rain analysis and

gridded (interpolated) model field. The code rework also forms the basis for the upcoming convective parameters of hail and lightning, which will also be verified against gridded data. The new flexible functions are also used to visualize a number of fields from AROME-RUC (total clouds, cloud RGB composite, precipitation, simulated composite reflectivity, sunshine duration) for internal monitoring, and to read and visualize multiple soil parameters of multiple models for monitoring purposes.

Proposed contributor: Phillip Scheffknecht (6pm)

5 Action: Post-processing of model output

Description and objectives: In 2021, in Hungary, work was started on post-processing of AROME and AROME-EPS outputs. The main objective is to improve the forecasts for global radiation and 100-meter wind speed. It will be decided if this topic can be kept for the future plans and extented to all the countries.

Proposed contributors: Dávid Tajti (1.25 pm)

6 Action: RC-LACE Gitlab platform

Description and objectives: The Gitlab server is available for exchanging tools within LACE and hosted by ZAMG.

Proposed contributors: Christoph Wittmann (1 pm), Simona Tascu (1 pm)

7 Action: Database of cases

Description and objectives: Further investigations will be made for selections of most suitable common database for different purposes and files.

Proposed contributors: Christoph Wittmann, Simona Tascu

8 Action: Trainings

A good opportunity to benefit more efficiently and rapidly from using meteorological products in various formats. This part of training is essential for the new employees and more than useful for the others, to save time. The video-conferences platforms are more and more accessible and used, therefore an online assistant and support can be offered by the area leader and/or by another colleague to the colleague who requested information about one soft or the installation mode. In order to find and

establish modalities on how to approach this training part, it is preferable to have maybe one course online per month, even if it will take one hour.

Proposed contributors: -

Summary of resources [PM]

Subject	Manpower	LACE stays	ACCORD stays (MQA?)
HARP implementation and verification for deterministic and probabilistic forecasts	**1.75**		
HARP linked to OPLACE database	**-**		
Multiple verification methods	**6.25**		
Post-processing of model output	**1.25**		
RC-LACE gitlab platform	**2**		
Database of cases	**-**		
Trainings	**-**		
Total	**9.25**		