



LOFAR NEWSLETTERS MARCH-APRIL 2020

Previous LOFAR newsletters are collected [here](#).

Announcements:

- **Proposals:** on 22-23 April, the LOFAR Program Committee (PC) allocated telescope observing time for Cycle 14, as well as for the long-term queue, which covers the period 1 June 2020 to 31 May 2022. Important factors will play a role during the next long-term period:
 - The windfarm will start operations and 'standstill sessions' with low-noise observing time will be available, but at short notice;
 - 30% of the Cycle time is reserved to allow the implementation of TMSS (more on this project can be found below);
 - Additional Cycle observing time will be used for further commissioning of new RO processes as we prepare for the roll-out of LOFAR2.
- **LOFAR & Windfarms:** an update on the wind- and solar- farms is available on the [LOFAR web pages](#). It provides information on the work done to minimize their impact on LOFAR observing.
- **Operations During Covid-19 Crisis:** in line with the advice from the Dutch government, ASTRON has taken important measures to minimize the risk of contamination by the Corona virus. Among these, employees have been asked to work from home till 20 May. So far, the observing program continued to run normally. However, operations are running remotely and therefore debugging and general communication concerning observing project(s) may not be timely. In case of any questions, do not hesitate to contact the Radio Observatory through JIRA at <https://support.astron.nl/rohhelpdesk>.
- **Jira And Project Communications:** all communications related to observing projects (including observation reports and requests to verify observing setups) are now handled through JIRA and replace older communications via e-mail. For questions regarding your observing project or user/technical support, please contact SOS through the RO helpdesk (<https://support.astron.nl/rohhelpdesk>) and include the project code in the subject of the ticket.

- **Lofar School:** in view of the current situation due to the corona virus, we are currently investigating options in relation to the 6th LOFAR Data Processing School, which is currently planned to take place at ASTRON, in Dwingeloo (The Netherlands) between 21-25 September 2020. We expect to give further details about this to our users within a couple of weeks.

Array & observing system status:

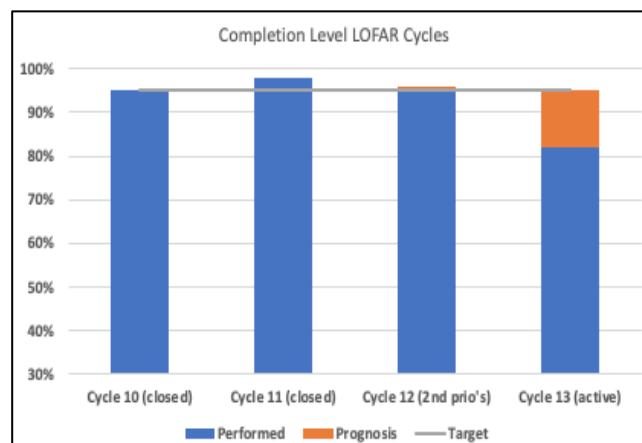
- 38 stations operational in the Netherlands: 24 core and 14 remote stations. 14 international stations operational: DE601, DE602, DE603, DE604, DE605, FR606, SE607, UK608, DE609, PL610, PL611, PL612, IE613, LV614.



- A new international station will be built in Italy by the end of 2022.
- The overview of non-operational antenna elements for LBA and HBA is available [here](#).
- No major failures were recorded on CEP hardware/software over the past two months. Issues with the ingest towards the LTA sites were faced and resolved. Currently, minor issues under investigation are experienced with the retrieval of data from the Poznan LTA site.
- The maintenance season has started for both Dutch and international stations.

Observing Programs

- The average observing efficiency of LOFAR since the start of Cycle 13 is 72%.
- The figure shows the completion level of the last four cycles. Cycle 12 and 13 are still in progress. The prognosis and the completion target are included. The target is set at 95%. The average completion level of the last three cycles is 96%.
- The Cycle 13 and Cycle 12 observing schedules can be found [here](#) and [here](#), respectively.



PROJECTS

Holography (S. ter Veen)

- Holography will be the new efficient way to calibrate the LOFAR stations and to monitor part of the system health. The development is entering the commissioning phase for HBA, in which the software and procedure will be tested. The plan is to deliver an operational mode for HBA by the end of the summer. LBA will follow after HBA is completed.
- Preliminary results indicate that the HBA's of most Dutch and international stations are well calibrated. A few stations require extra investigation.

LOFAR Software Development (A. Klazema)

- The LOFAR installation of WinCC OA has been updated from 3.14 to 3.16. This software package is used to monitor the LOFAR telescope and is running on our central systems as well as on all the stations. The upgrade provides an enhanced way to monitor the international stations for the station owners.

Telescope Manager Specification System (TMSS; R. Pizzo)

- TMSS (Telescope Manager Specification System) will be a brand-new software application for the specification, administration, and scheduling of LOFAR observations. Its realisation is crucial, as it will enable the required support for LOFAR2.0 use cases, while also streamlining LOFAR operations and improving the adaptability and maintainability of software for future extensions.
- By the end of 2020, TMSS will deliver with high priority the software components for executing the LOFAR2.0 Survey Use Cases. By doing that, the project will implement also other LOFAR Science Use Cases, which will ensure a healthy continuation of the Cycle observing programs also before the start of the LOFAR2.0 surveys.
- The TMSS project started in January 2020. Its first phase will complete by the end of the year. During its first quarter, the project implemented the system foundations in terms of telescope model and database. In the second quarter (currently in progress), the system will be fully capable to perform the survey observations and pipelines, with the required handling of and feedback on system resources, and will implement also *dynamic scheduling*. The following cycles will deliver support for the other planned use cases and responsive telescope functionality.
- During the sprint review on 21 April, the system has seen its first light when it demonstrated to already be able to perform a survey-type LOFAR observation. This is a

very important milestone for the project and the first of several more expected in the next months.

LOFAR2.0 (W. van Cappellen)

- The LOFAR2.0 program will upgrade the LOFAR stations to enable simultaneous LBA and HBA observing and will deliver a clock distribution system based on White Rabbit to accurately synchronise all Dutch stations. The program is working towards a Critical Design Review of the new stations in 2021. The roll-out of the new stations is planned for 2022-2023.
- The design of the Station hardware and firmware, the timing distribution system and all associated monitoring and control software are proceeding to plan. The Preliminary Design Review has been passed and the detailed design is ongoing.
- Prototypes of the White Rabbit clock distribution hardware are currently being installed and tested on 4 LOFAR stations to verify their performance and interfaces to the LOFAR system.
- A European tender to procure the signal processing boards (Uniboard²) has been successful and resulted in an attractive offer.
- The interfaces and functionality of the Station Stand-Alone mode (formerly Local Mode) will change and are currently being defined with the representatives of the ILT consortia.

COBALT2 PHASE 2 (C. Broekema)

- Phase 2 of the COBALT2.0 project has started implementing new functionality to leverage the increased hardware capacity of the recently installed hardware. At the time of writing, the team has completed three sprints and is currently working on the fourth. The first sprint was taken up by an intensive, but highly successful knowledge transfer process. We are now finalizing the first addition to the COBALT2.0 code, which we expect to fully test, commission, and roll-out in the next couple of weeks.
- The first deliverable will add the ability to redigitize beamformed data products to lower their bitdepth, allowing the formation of more tied-array beams within the bandwidth limit to our storage cluster. In the course of this work we explored the relative error introduced, which turned out to be minor, except when clipping. This additional feature includes a minor update to the LOFAR Data Access Library (DAL) and associated Interface Control Document (ICD).

Science Delivery Framework – Production Pipeline Enhancement (SDF-PPE; T. Shimwell)

- In the science delivery framework (SDF) project there have been several avenues of work which is largely done in collaboration with other projects such as EOSC and ESCAPE. The activities include running PreFactor3 on the LTA facilities (building on the existing LOFAR surveys infrastructure), making a user/observatory interface to operate this, translating PreFactor3 into the Common Workflow Language (CWL) to enable easier maintenance of the pipeline, and working towards an archive for the more advanced data products.
- All aspects of the work are still in progress but already we are able to initiate the processing of observations through the latest version of PreFactor3 from a central location, make use of both SARA and Juelich compute resources for processing, and archive the PreFactor3 products on SARA storage.
- Over the coming months many refinements will be made to enable this procedure to operate more smoothly and with additional functionality.

Calendar next LOFAR activities:

The dates of LOFAR Status Meetings, roll-outs and stop days are listed in an online calendar that is available [here](#). In particular, we emphasize:

- Next LOFAR bulletin: June 2020