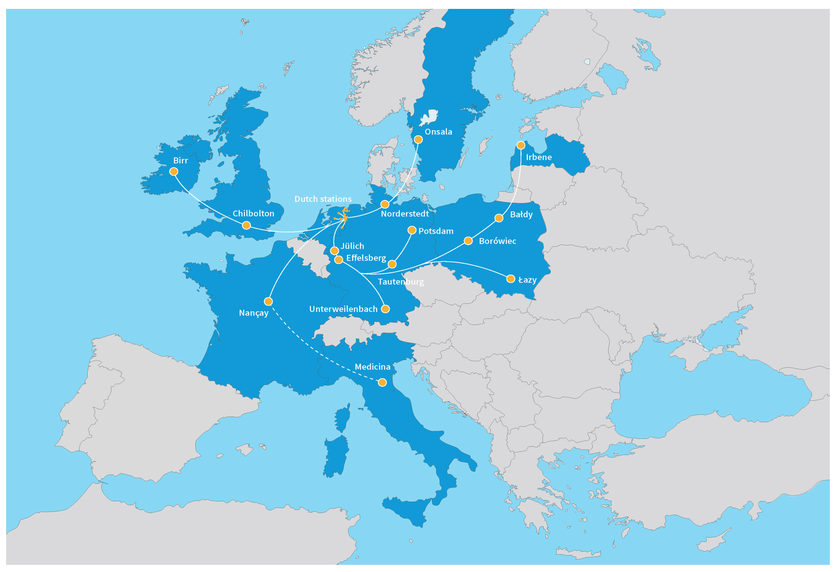
The LAST resort:

towards LOFAR Automatic Scheduling Tool

Generating & executing an efficient observing plan

The new observing capabilities offered by current and next-generation massive arrays pose a challenge in translating user proposed campaigns into an efficient observing program

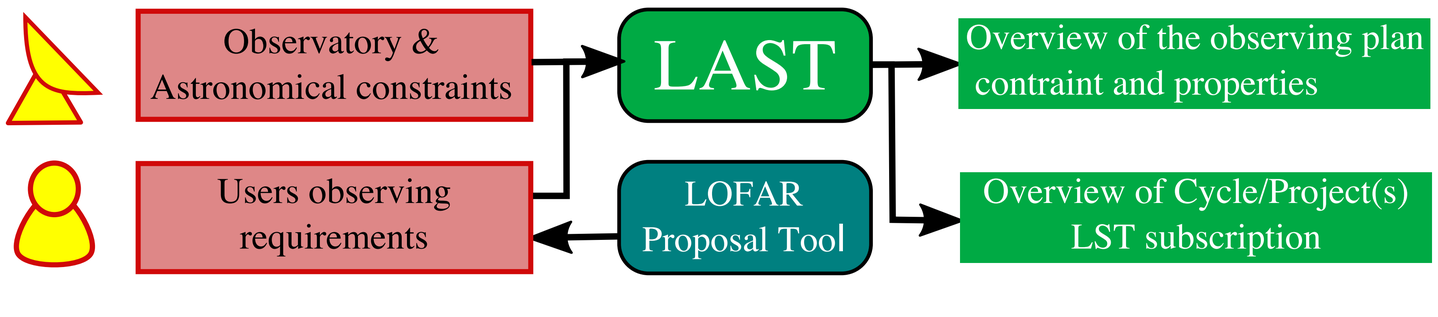
To increase both observing time and the scientific output of next-generation massive, arrays a robust, automatic and dynamic scheduling is fundamental. This is especially true on distributed telescopes like LOFAR where the instrument duty-cycle strongly varies with time (because of e.g. the unpredictable performance of the network infrastructure).

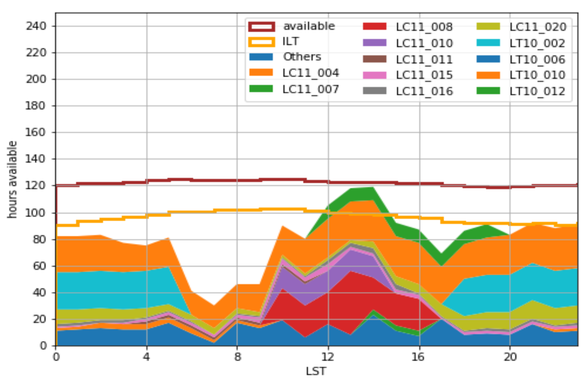


Forecasting an observing plan: assessing the degree of schedulability

Automatic generation of an observing plan

Dynamic scheduling and integration into LOFAR





From top left to right bottom clockwise examples of:
- distribution of observing hours availability as a function of the LST for main observatory & astronomical constraints.
- overview per project of requested observing hours as a function of the LST for main observatory & astronomical constraints.
- overview of the cumulative LST ovsersubscription for main observatory & astronomical constraints.

Phase 1: Forecasting an observing plan

Phase one delivered a set of tools to
1) model an observing cycle in terms of observing hours availability under a broad set of constraints;
2) describe any user proposed observing campaign by a set of specified system and observing constraints and
3) forecast the amount of requested vs available observing hours in the modelled observing program.
Based on these overviews, the observatory can manually translate users proposed campaigns into an efficient observing plan.

LAST, available on GitHub, is already used to advise the LOFAR time allocation committee, interactively. It is available on GitHub and it is based on the AstroPlan library.

Phase 2/3: Automatic generation & dynamic scheduling

The next steps will deliver:
- automate the generation of the observing program
- definition & testing of metrics of scheduling efficiency
- evaluation of algorithms
- develop a user interface to display and interact with LAST
- integrate the tool in the production system to dynamically execute the observing plan.

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