LOFAR Surveys KSP experience contribution

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Summary of our cycle 2 and cycle 3 observations

- Science support has been excellent in supporting our project and our cycle 2 and 3 observations have been successful.
- In cycle 3 33 8hr runs were performed. About 1/3rd have a missing antenna and a similar number have a few sub bands missing. A couple of times during the cycle the observations were rescheduled due to lack of disk space.
- In cycle 2 31 8hr runs were performed. Four observations were severely flagged due to hot temperatures. A similar fraction to cycle 3 had missing antennas, missing sub bands and rescheduling due to a lack of disk space.
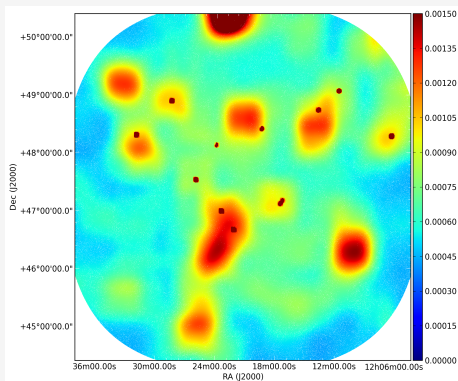
A-projection

HBA images made with awimager with and without the beam show little difference.
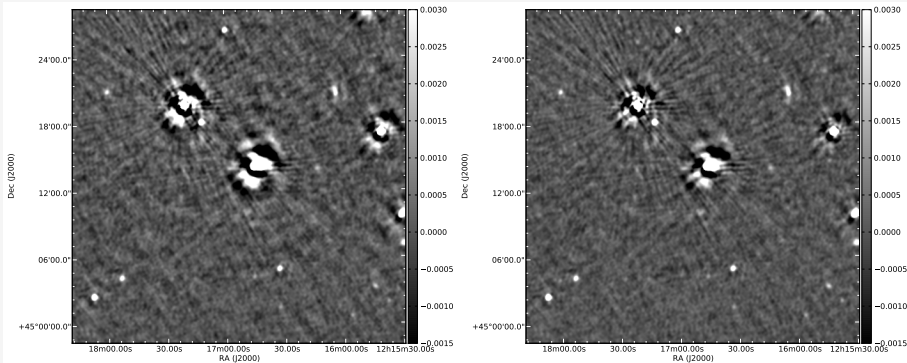
Left: with beam. Right: without beam. This region is 2.5deg off center.

Does the ionosphere dominate? Is the beam model not good enough?

Awimager – **CLEAN**

The noise on the images varies significantly over a pointing. **CLEAN** allows only one threshold when **CLEAN**ing. Using an rms image would be better.

Continued support for facet calibration pipeline

The facet calibration scheme developed by Reinout van Weeren has successfully created thermal noise limited HBA images at full resolution.

Pipelines and tools used by the facet calibration scheme should continue to be developed.
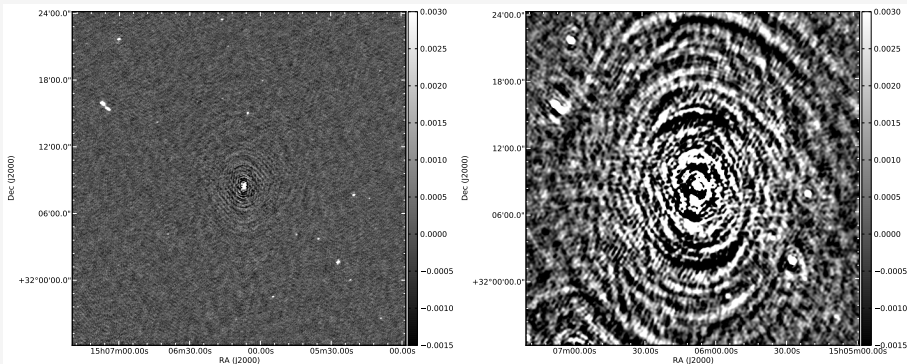
Left: facet calibration. Right: normal calibration. (2Jy source in A2034 field)

Running multiple observatory pipelines

The observatory runs one pipeline on HBA survey observations and we try to facilitate international baseline and spectral line studies by keeping huge datasets (64Gb per sub band – 16ch/sb and 1sec averaging)

By running multiple pipelines we could have smaller and more processed datasets.

Other Issues – before observing

- Northstar would not allow a large number of pointings to be submitted.
- Time between receiving the proposal feedback and finalising the plans for accepted observations is too short.

Other Issues – after observations

- Inspection plots are not very useful and the 24hrs to inspect them is not sufficient – 12500 plots for an observation.
- Notifications of observations could be improved and the user could be notified when: 1) an observation is complete (and you have 24hours to inspect); 2) the pipeline ends; and 3) data is in the LTA (and you have 2 weeks to check quality).
- The filenames could be attached to the staging notification email (currently just provided with a staging ID).
- If errors occur during staging then a resubmit link could be included in the error email.
- The ability to stage data with a script rather than the web interface would be very useful.

Other issues – reducing data

- It is unclear what versions of the LOFAR software run where and with what version data was (pre-)processed.
- Very time consuming to install and maintain our own LOFAR software.
- More frequent and thorough feedback on software updates and how future improvements are being prioritised.
- Many users struggle with the same problems and develop their own scripts. Maybe a repository of user-contributed scripts or a community run and well advertised ticketing system.

Other issues – reducing data

- Our data are primarily reduced at the users' institution using the generic pipeline. In the future we could think about the observatory running the pipeline we have developed.
- Flagging of data could be improved to remove bad antennas and to pick up where the phases cannot be calibrated.
- The in-band spectral index values are too steep due to known issues with the beam.
- Due to the rotation of dipoles on CS013 we always flag these data which is a shame.