

Minutes Busy Wednesday Videocon of April 5th 2012

**Present: Roberto Pizzo, John McKean, Reinout van Weeren
Annalisa Bonafede, Glenn White, David Rafferty, Laura
Birzan, Bas van der Tol, Sven Duscha, Alexander Mueller,
George Heald, Huub Röttgering, Cyril Tasse, Giulia
Macario, Aleksandar Shulevski, Ger de Bruyn, Wendy
Williams, Ronald Nijboer, David Mulcahy, Christian Vocks,
Ger van Diepen**

Number of participants: 21

Progresses with the commissioning:

- We summarized the progresses made by the different groups working on the following targets/tasks since the last Busy Thursday:
 - a) **Demixing with NDPPP (A. Horneffer):** the demixing within NDPPP was first tested on an MSSS observation centered on 3C295. The documentation on the LOFAR Wiki was used as a reference to run the algorithm. The visibilities after the NDPPP-demixing were imaged and the map was compared with the image obtained after using the conventional demixing. The subtraction of the two images shows only a residual peak - at the level of 1% of the original source peak flux- at the location of 3C295. In conclusion, the demixing within NDPPP seems to work fine.

A second test was performed on an MSSS observation of 3C48. This source was thought to be a bad amplitude calibrator for MSSS mainly because of its vicinity to CasA. NDPPP-demixing was expected to properly handle this difficult case of A-team subtraction. The final results show that 3C48 remains a bad amplitude calibrator for MSSS. However, the new algorithm does improve things with respect to the conventional demixing in terms of quality of the final map (noise lower by 20%). Therefore, the poor behavior of the gains of 3C48 is likely due to the fact that this source does not dominate its field as much as e.g. 3C196 and 3C295, which are currently used as MSSS calibrators. Further tests will be performed on sources lying very close to the A-team. A report will be given during one of the next next Busy Thursdays.
 - b) **A comparison between BBS directional gains and SPAM peeling solutions using GMRT data (L. Birzan):** directional gain solutions from BBS were compared to those from the SPAM package (developed by Huib Intema) and found to agree well, in general. However, it is not clear if BBS can match SPAM in terms of signal-to-noise of the solutions, particularly for the fainter ionospheric calibrators. Once BBS allows the use of the original UVW coordinates (instead of

forcing recalculation), we will need further testing with the GMRT data. These will include comparison of directional gains towards all 19 calibrators and using longer solution intervals for the fainter calibrators, as done in SPAM. Lastly, a full comparison (including imaging) between SPAM and the output of the entire ionospheric correction software of LOFAR (including BBS and the AWImager) should be made using this data set (or a similar one).

- c) **The HBA low bandpass (D. Rafferty):** the HBA global bandpass was computed for a 30 minute observation of 3C196 (L36691). The calibration was performed in BBS using a 5-second time interval on data flagged for RFI (with rficonsole) and compressed to one channel per sub band. No demixing was done. A simple point source model with a spectral index of -0.64 was used for the calibration. The bandpass was derived by calculating the median of the resulting amplitude solutions for each sub band over ~3-minute periods, after iterative flagging of outliers. The final plot shows that the HBA-low bandpass changes much less across the band than the LBA bandpass; it varies by less than 20% from its peak at ~127 MHz. Examining the bandpass of individual stations, it is found that while most stations have similar bandpass shapes, there are significant differences in the bandpasses of ~1/3 of the stations. Many of those with large differences are the stations with longer mean baseline lengths. Therefore, much of this variation may be due to inadequacies in the model at long baselines, as 3C196 is known to be a double source. Further tests with a double point source model are planned.

The reports are available on line at the commissioning section of the LOFAR wiki:

http://www.lofar.org/operations/doku.php?id=commissioning:busy_wednesdays

ISSUES:

OPEN (work in progress)

- a) A parset library will contain the best parset files used by the commissioners. These could be adopted for different data reduction strategies;
- b) implementing the decorrelation factors in BBS should have **HIGH** priority;
- c) a completion bar is needed in BBS to more easily understand how long the calibration will take;

- d) it would be good to have some parameters in the aoflagger step of NDPPP to be able to set the severity of the flagging. Ger van Diepen is trying to implement this in collaboration with Andre' Offringa;
- e) The new patch specification is now available in BBS and is being tested by Annalisa and Giulia. A report will be given at the next Busy Thursday.

ANNOUNCEMENTS:

- *ldb001 has been upgraded to the same OS and database version as ldb002. It received a SSD and it should be faster than before. Please, recreate your database before running BBS!*
- The next Busy Thursday will host a discussion about the source finders. All the developers will participate. We will try to summarize the current situation in terms of source detection in LOFAR maps and we will try to come up with a rigorous method to state the quality of the result of the source extraction.
- Starting from the next Busy Thursday, the afternoon videocon will be moved from 2:30 pm to 1:30 pm. In this way, we will avoid any overlap with the Colloquium, which takes place at ASTRON at 3:30 pm. All the commissioners who will physically be at ASTRON for the Busy Thursday are invited to attend the colloquium.
- It is suggested to all commissioners to summarize what they have obtained with their datasets and think about potential publications with their results. Many of these results have been presented in various conferences and proceedings, clearly showing that the data we have in hand has quite some potential. It is now time to judge and state what can be published and aim at doing that within the next 3 to 6 months. We will discuss this topic again at the next Busy Thursday.
- Version 11.0 of the Lofar Imaging Cookbook will be release tomorrow, Friday 6 April 2012. Among other updates, sections on AWimager, Sagecal, and NDPPP-demixing will be present.
- CEP 1 needs to be cleaned up! Please, delete the data that you do not need anymore.

The next Busy Thursday will take place on April 19th 2012