

## LOFAR Calibration & Imaging Tiger Team

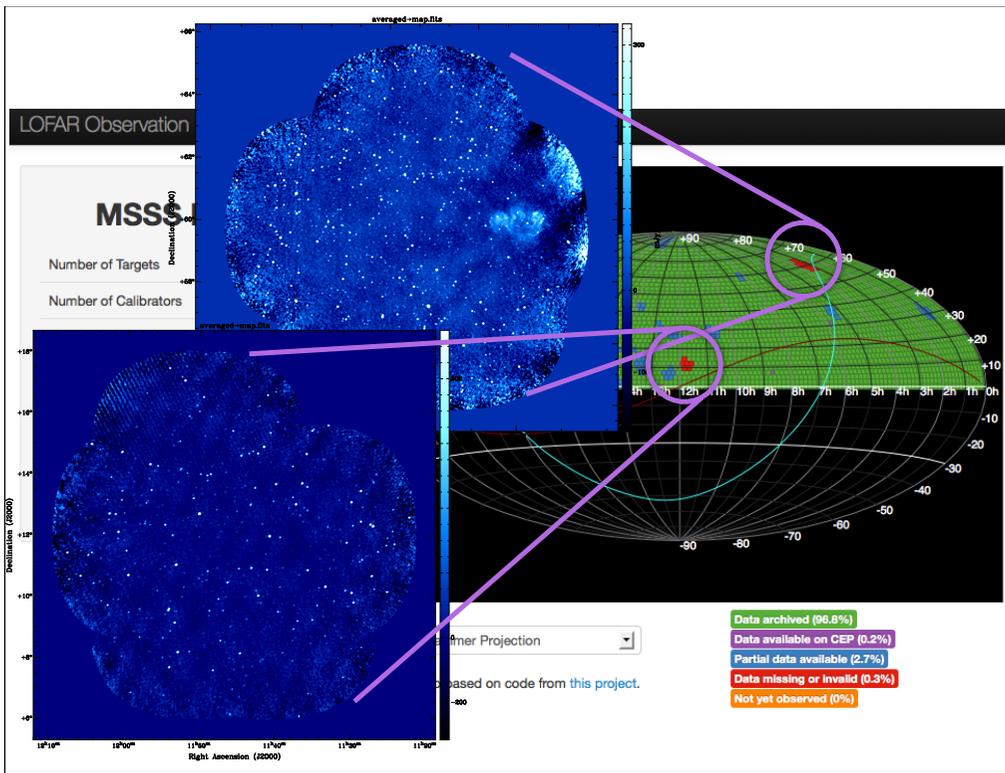
### Status Update

George Heald  
LOFAR Status Meeting  
05/03/2014

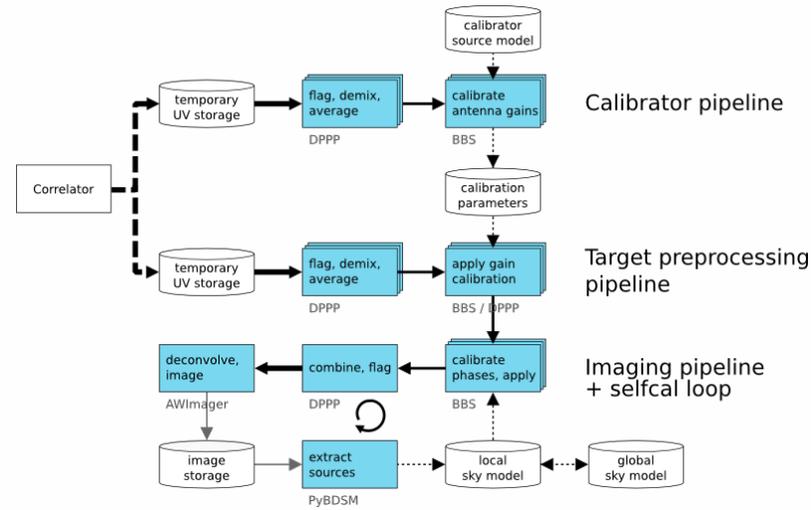
ASTRON is part of the Netherlands Organisation for Scientific Research (NWO)



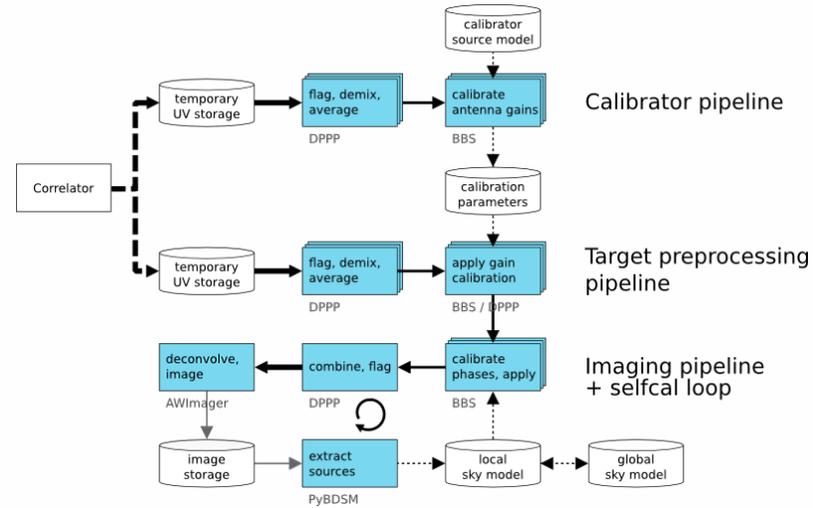
**LOFAR**



- Provides first-level automatic data processing (to images), written in C++ and python .... LOFAR's "science data processor"



- Rudimentary (“MSSS”) version in place, providing  $DR < \sim 1000$
- TT scope: provide science data products *under certain conditions*



- Team is continuing a weekly meeting schedule



George Heald / LOFAR status meeting / 05-03-2014

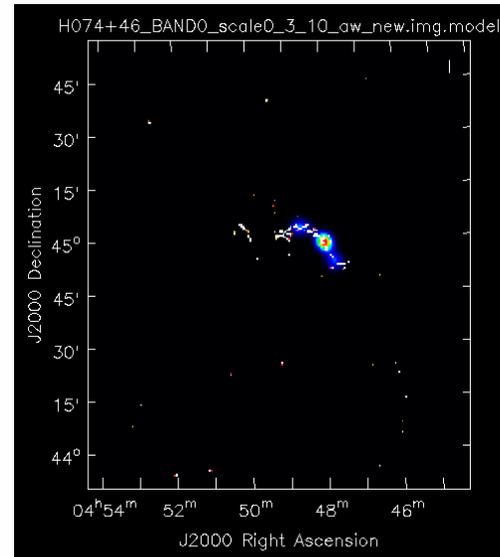
- Management tasks being clarified and divided between
  - PI, George Heald
  - PM, Tammo Jan Dijkema
- Division of roles and responsibilities being finalized

- Panel of external calibration & imaging experts, formed to provide valuable input to the TT and provide communication channel to science teams
  - for example: now creating awimager Use Cases
  - biweekly telecon schedule
- Team members:
  - Björn Adebahr (MPIfR)
  - Jess Broderick (Oxford)
  - Francesco De Gasperin (Hamburg)
  - Martin Hardcastle (Hertfordshire)
  - Maaijke Mevius (ASTRON)
  - Reinout van Weeren (CfA)

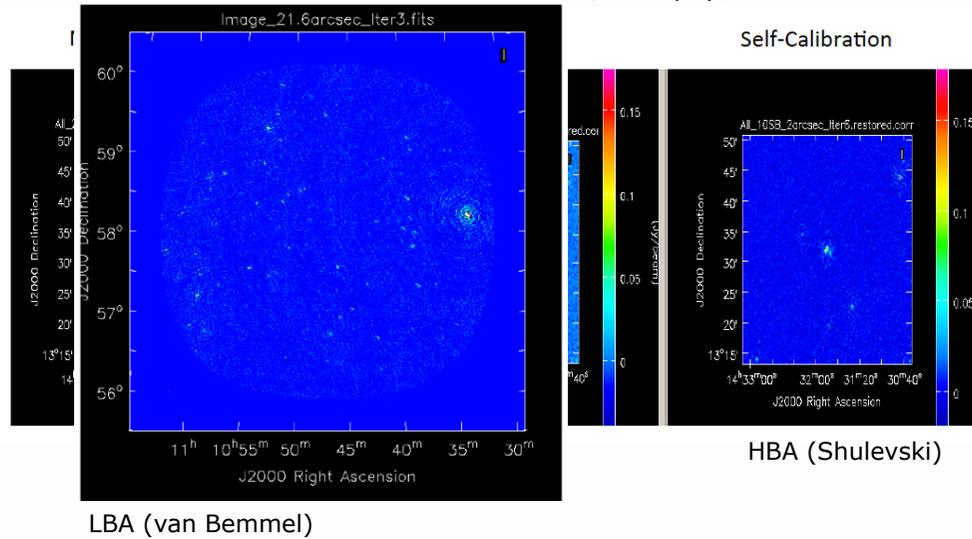


- Goal: make calibration faster
  - Decrease run time, decrease memory usage
  - Direction independent calibration is used in selfcal loop
- How to achieve this
  - Avoid the overhead of BBS, use NDPPP instead
    - BBS will remain there for more involved calibration schemes
  - Use stefcal for direction independent calibration
  - Use multithreading
- Status
  - Not ready for general testing yet
  - Gain only calibration works
  - Full polarization calibration shows **speedup of ~15x**
  - Beam can be applied
  - Investigating directional gains

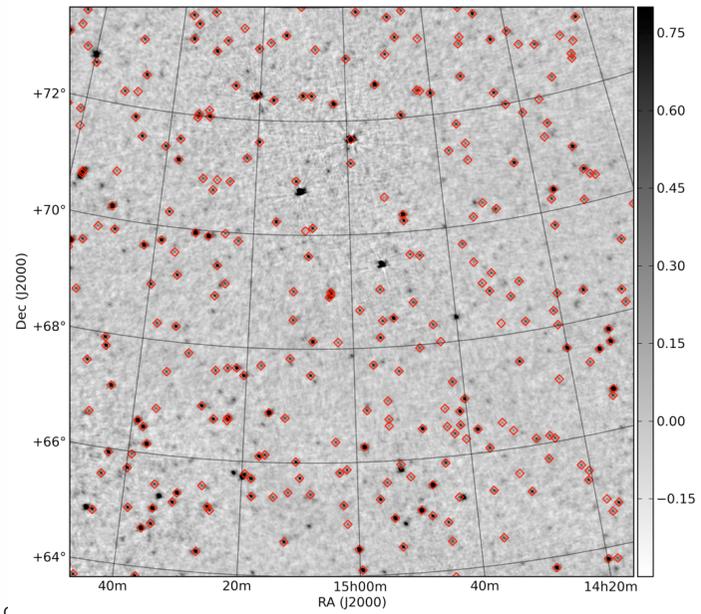
- Technical developments so far, aiming for added functionality and moving toward speedups
  - Transition to casa 4.2
  - Use of the WEIGHT\_SPECTRUM column
  - Multiscale cleaning
  - Support for beam model plugins (C++ or Python)



- Selfcal pipeline functional in HBA low, LBA, and now HBA high
- HBA low: demonstrated 15x lower noise, 500  $\mu$ Jy/beam in full band

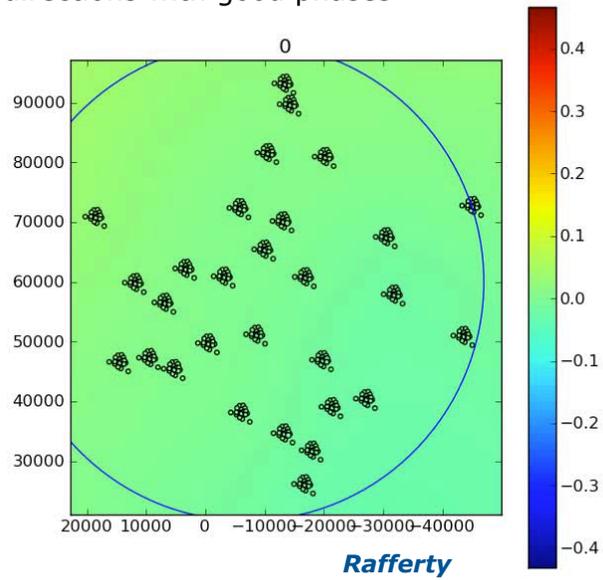


- LBA 46 mJy/beam, 2' resolution



George Heald / LC

- Using BBS direction-dependent gain solutions, now on patches
- Up to 30 directions with good phases



- Ultimately merging these development streams to produce a fast pipeline with a functional major cycle including direction dependent calibration and a capable imager
- Development of a 2-year plan, to be presented in April

