The Quest to bring AARTFAAC online

3rd LOFAR Science Meeting, Zandvoort
06 April, 2016
Peeyush Prasad, UvA
For the AARTFAAC team
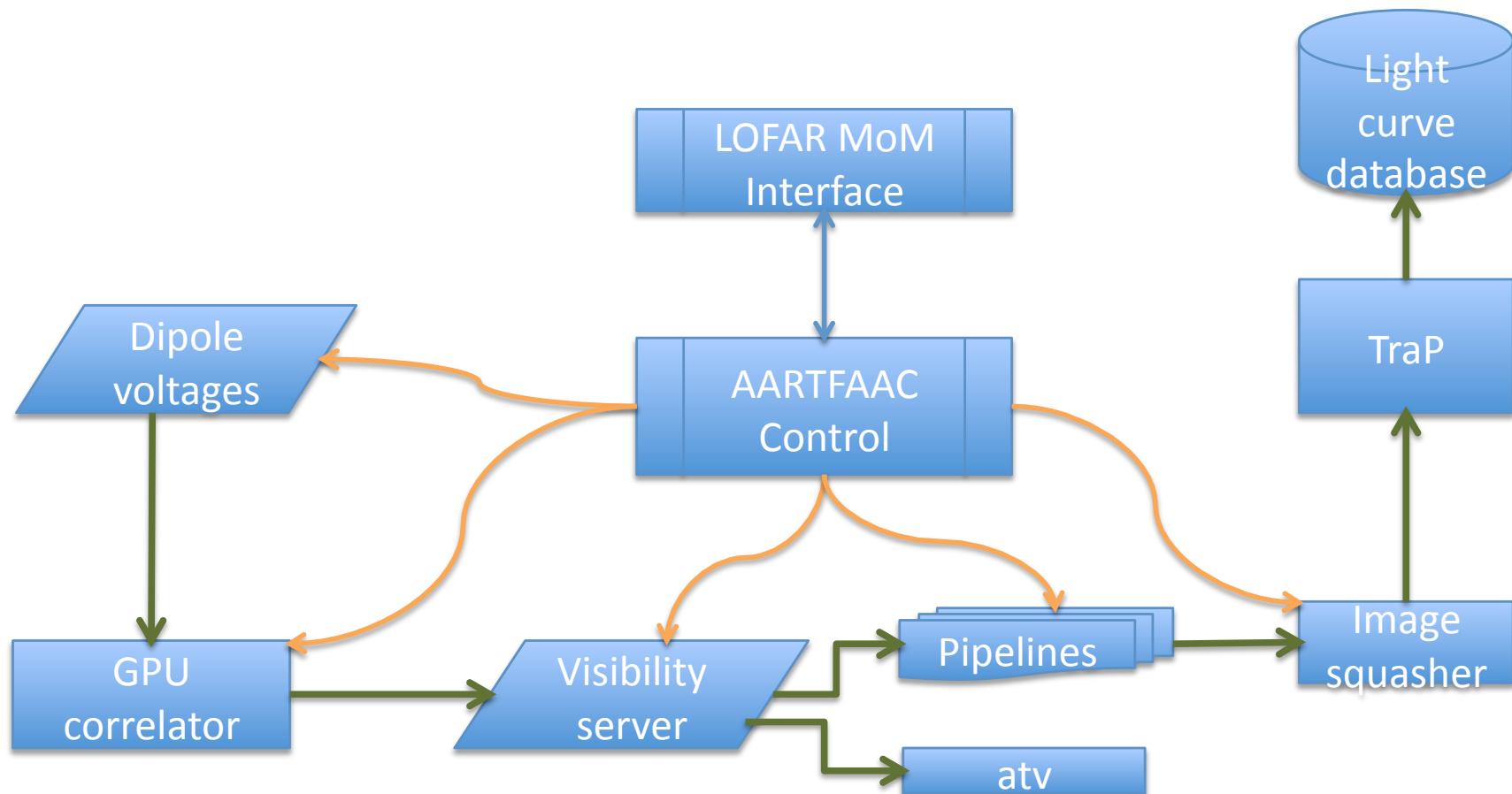
The AARTFAAC All-sky monitor
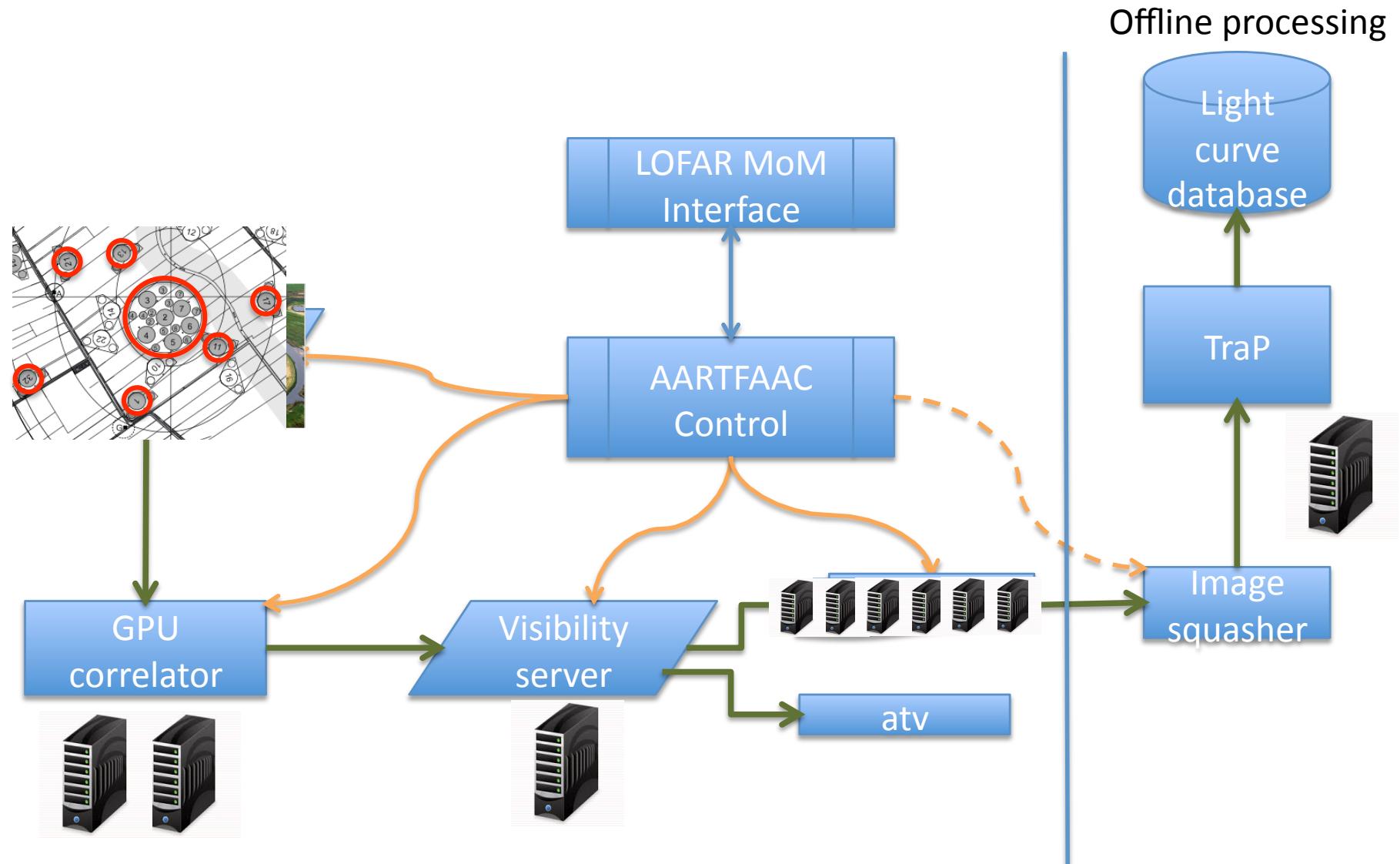

- Image plane transient detection via light curve extraction of all visible sources.

- Near real-time response (~sec latency), trigger generator for full sensitivity LOFAR observations.

# Functional blocks, data flow
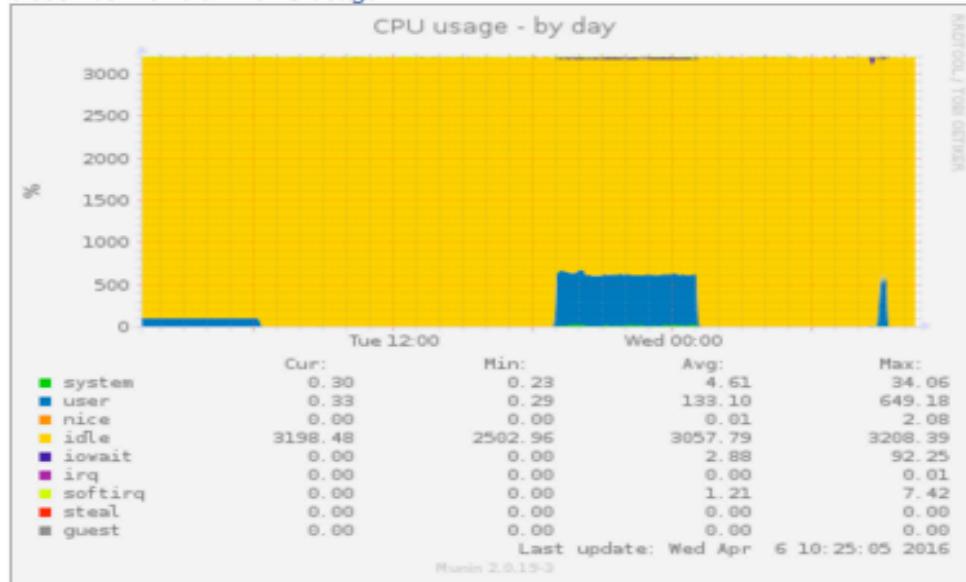
Functional blocks, data flow
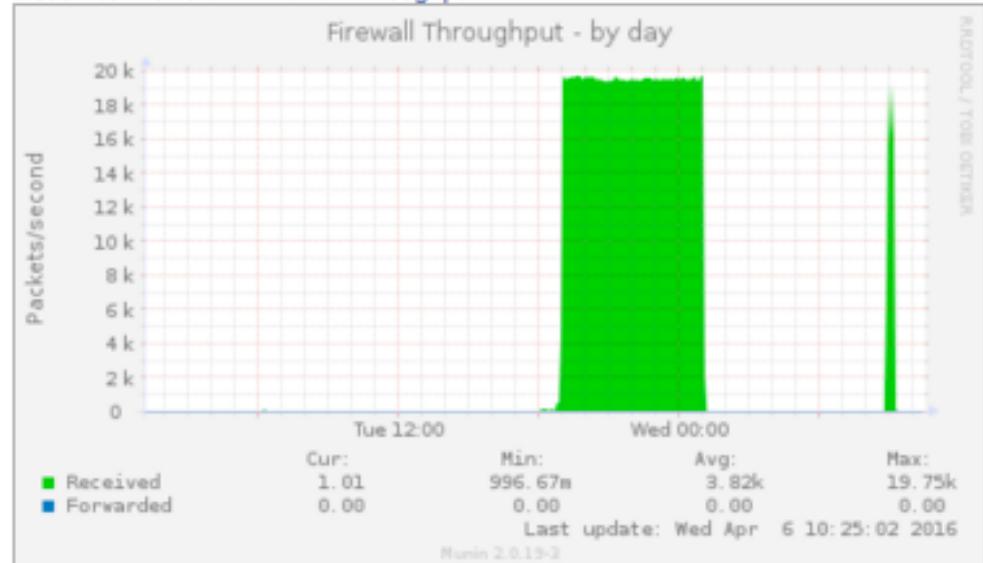
Control and Monitoring
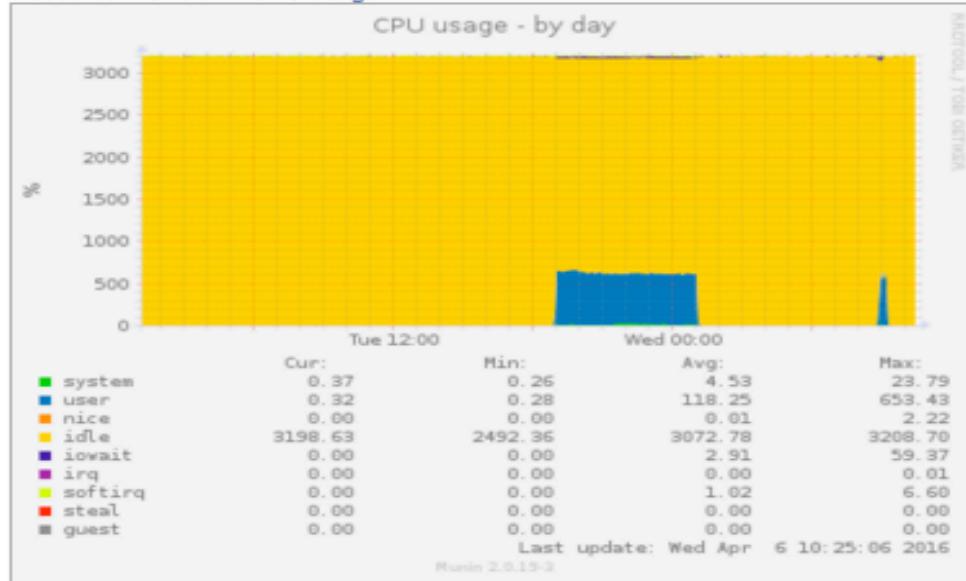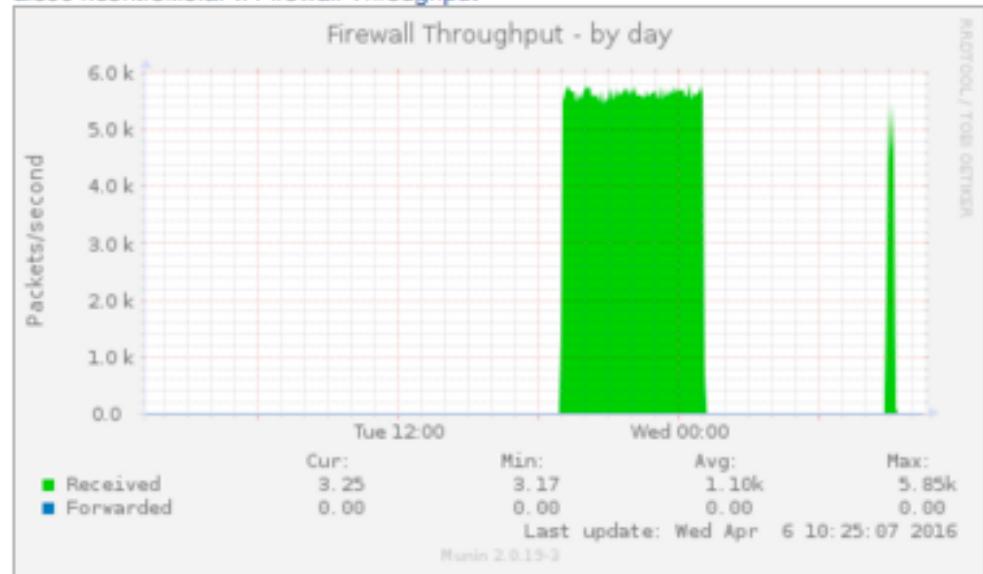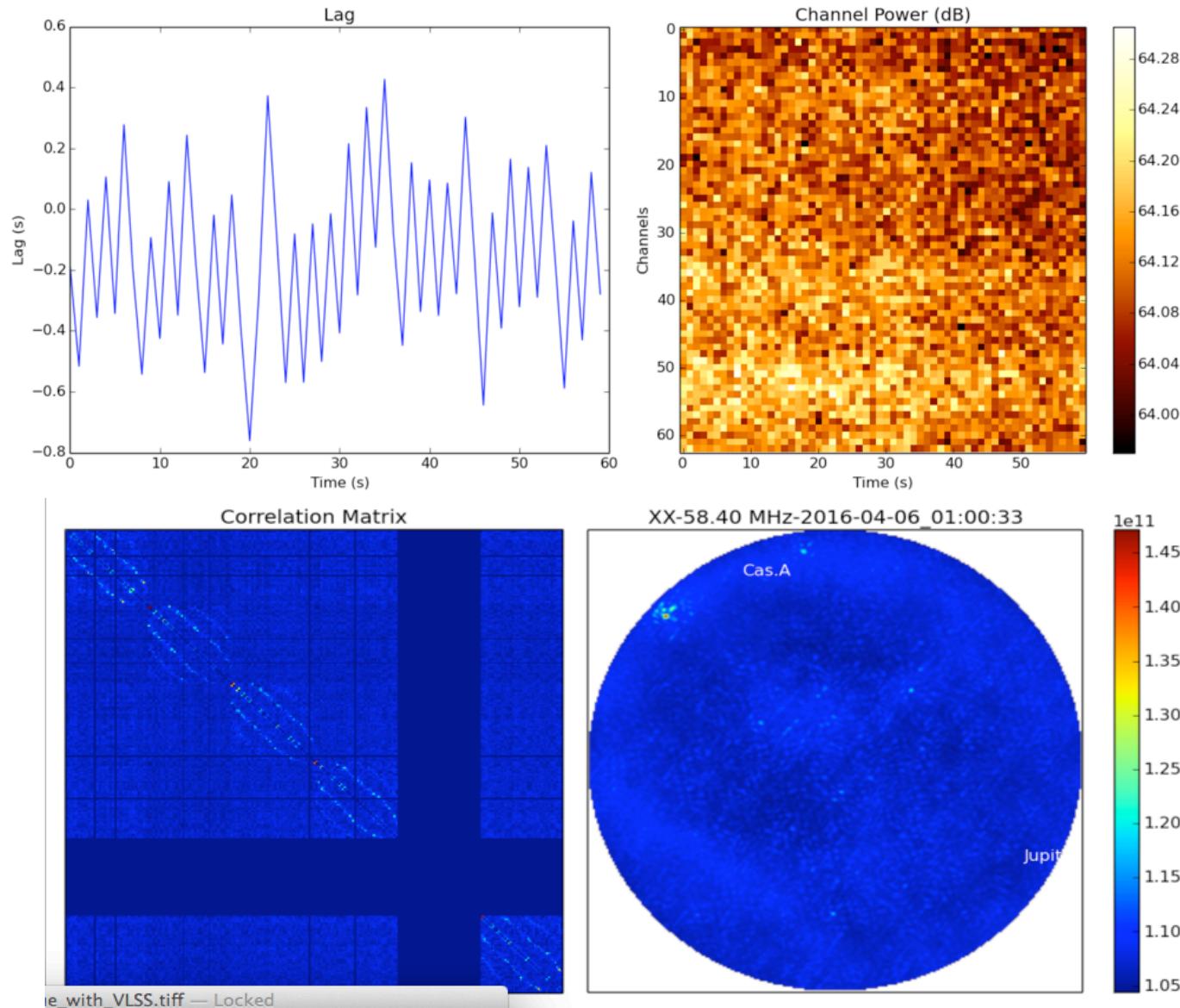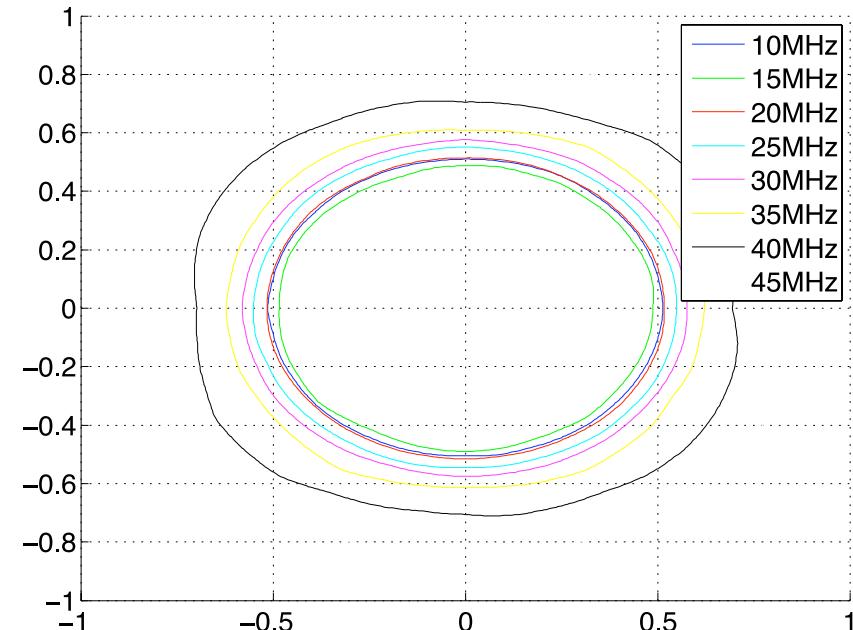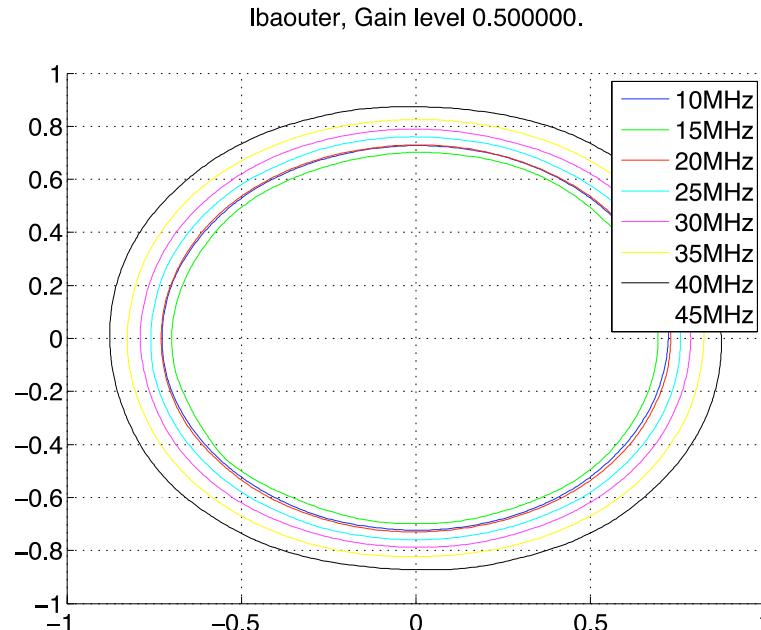
Control and Monitoring

Flux calibration
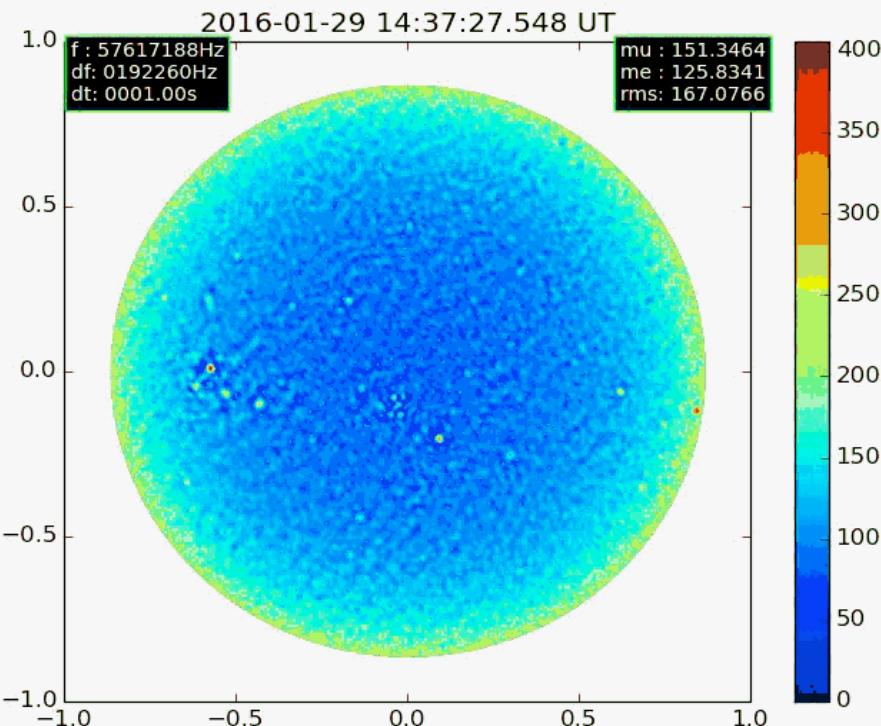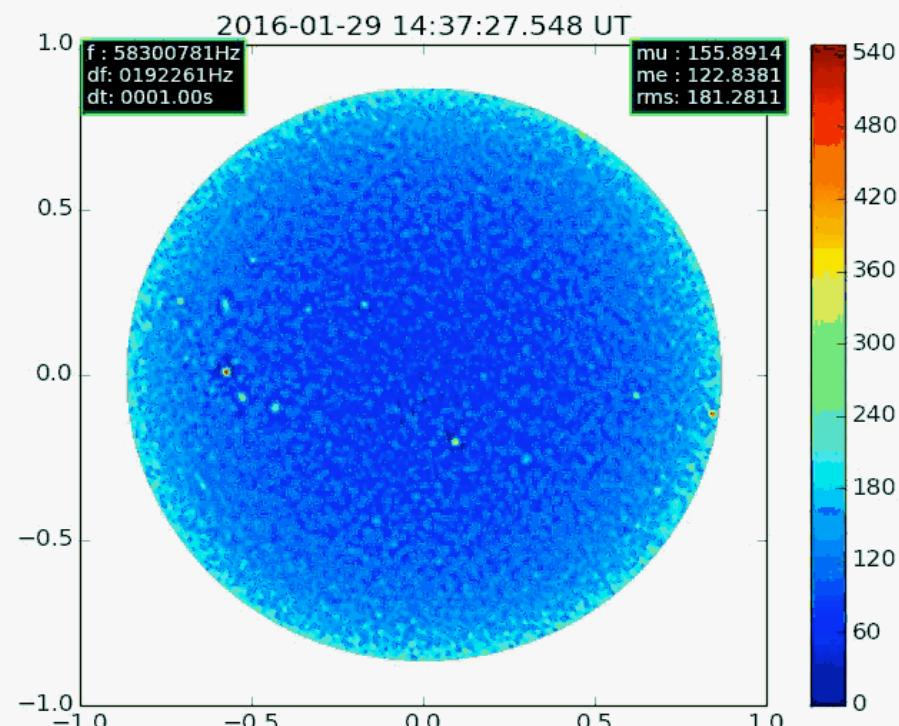
- Primary beam correction via beam model from EM simulations.
- Flux calibration based on models from Scaife and Heald (2012)

# Imaging strategy

Image integration over subbands
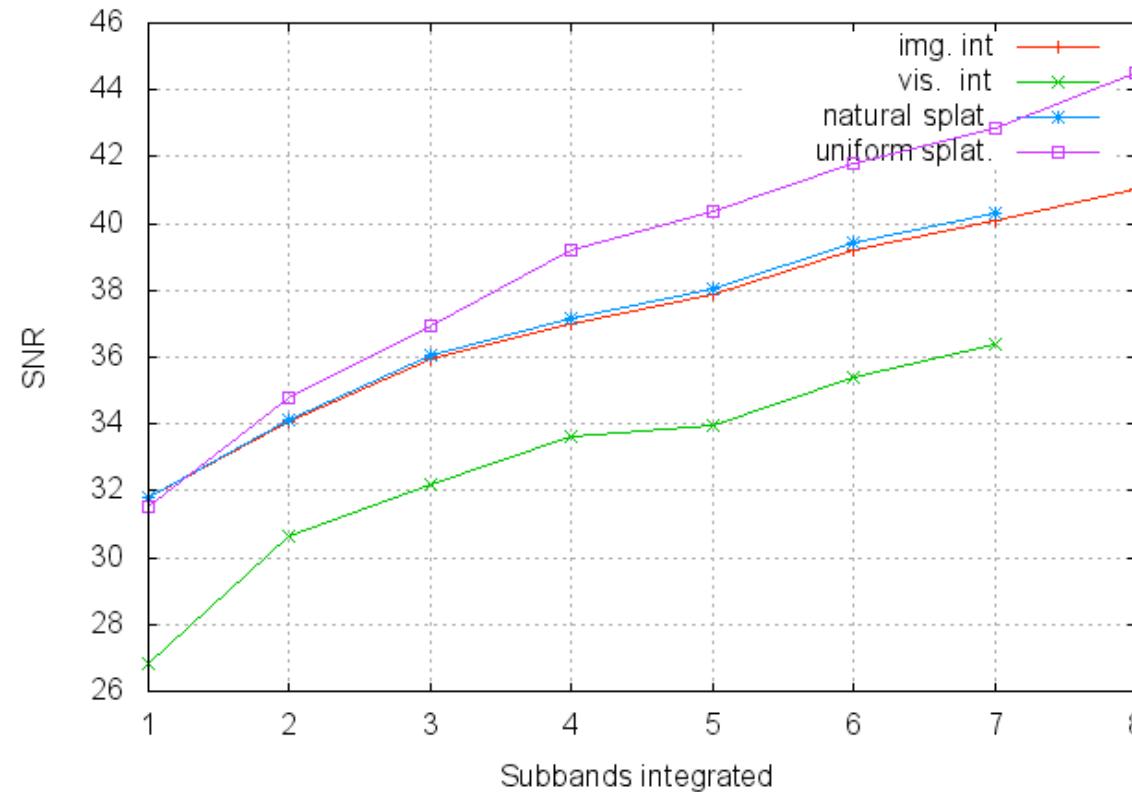
Visibility splatting on common grid, uniform weights

- Real-time flagging based on spectral median filtering of visibilities.
- Amplitude and phase calibration at 12kHz channel level.
- Imaging bandwidth of 1.5MHz, visibility splatting onto common grid.
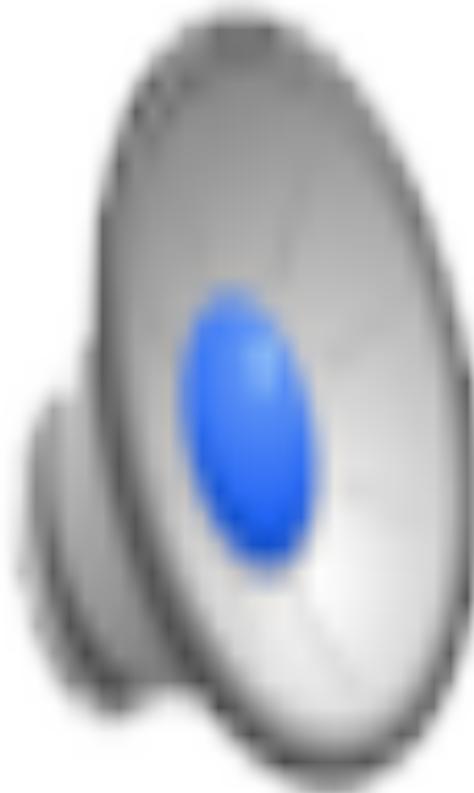
Imaging strategy

Central region SNR: Various integration, 20160129T143727
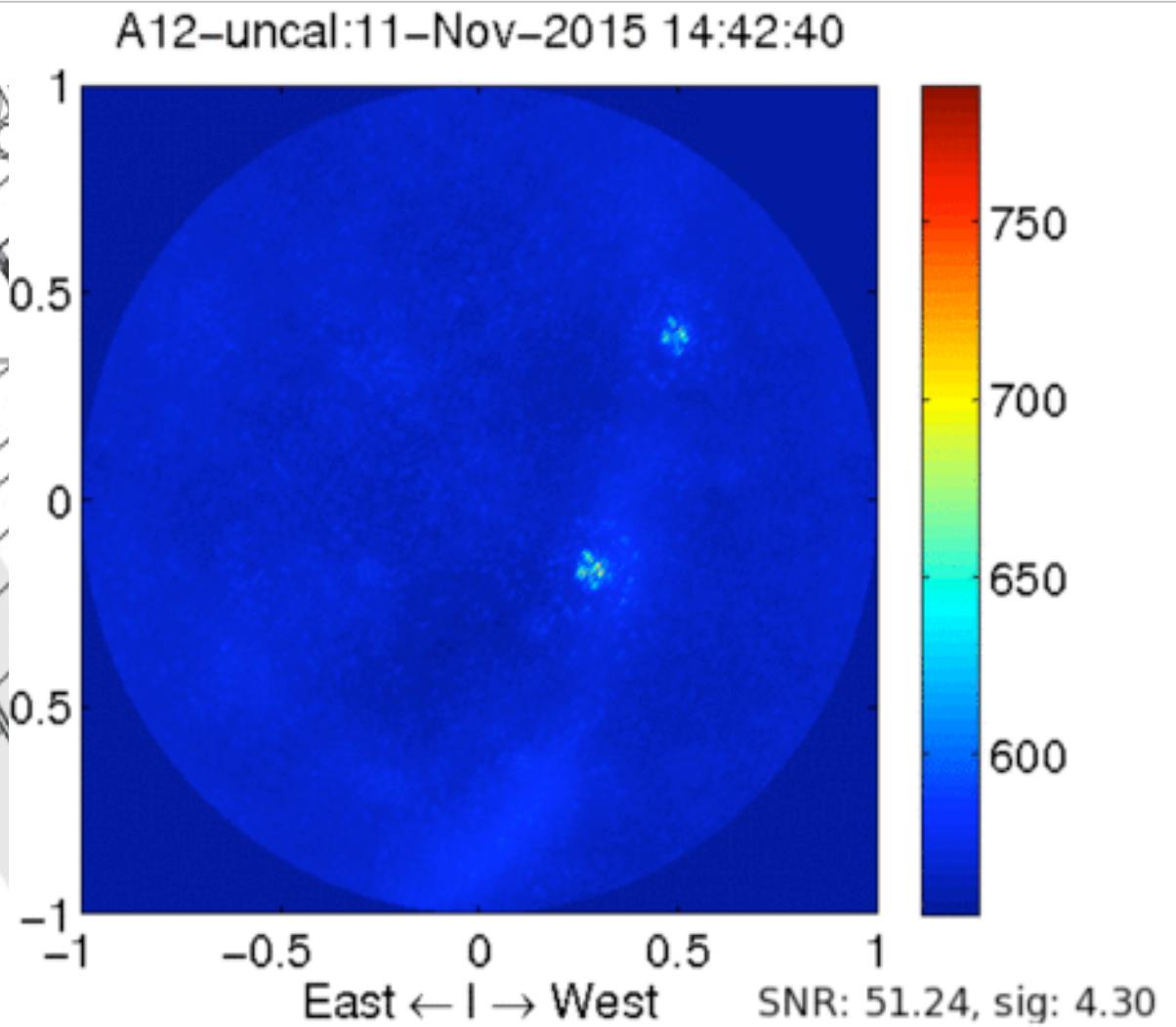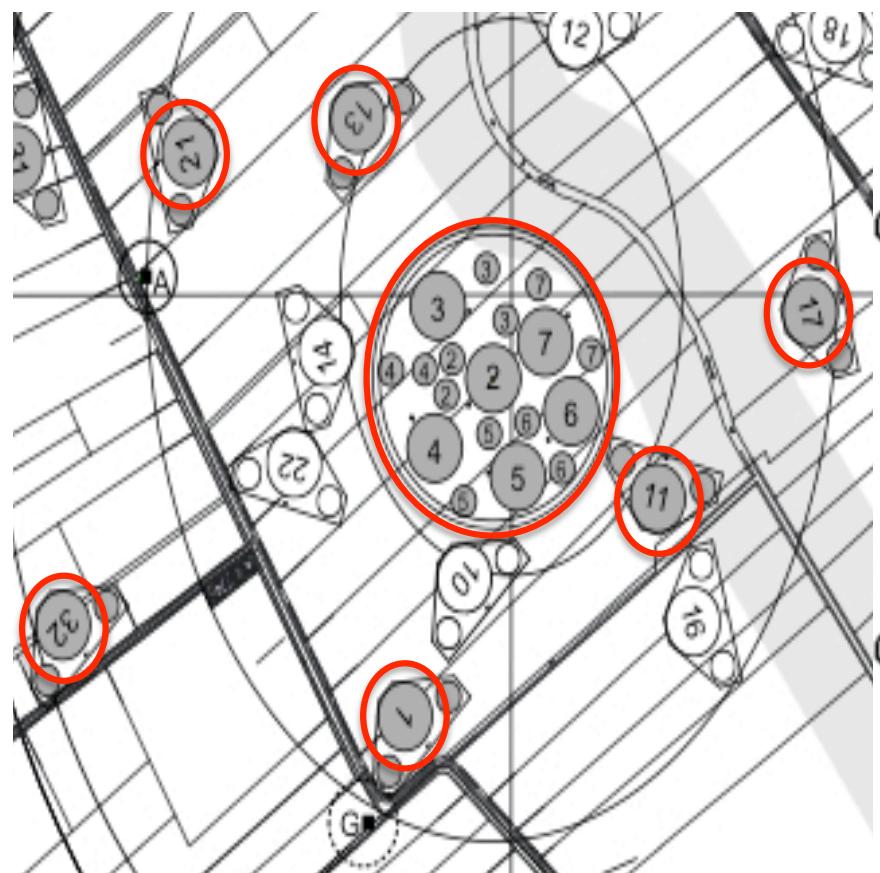
- Real-time flagging based on spectral median filtering of visibilities.
- Amplitude and phase calibration at 12kHz channel level.
- Imaging bandwidth of 1.5MHz, visibility splatting onto common grid.

Current status
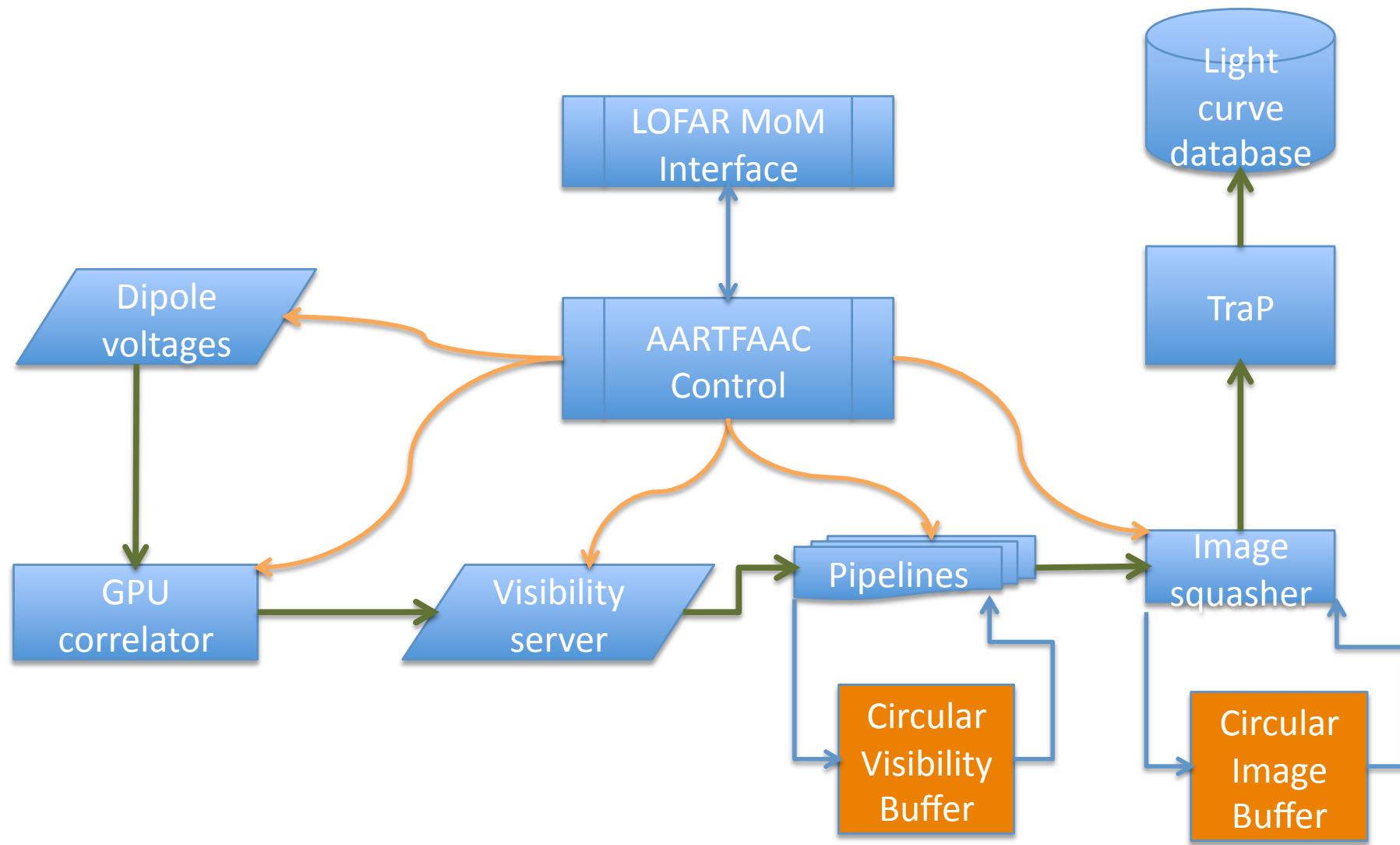
- 6 stations operational, generating autonomous images
- Processing 8 subbands in 16-bit mode.

Roadmap: 12 station AARTFAAC

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East ← l → West

SNR: 51.24, sig: 4.30

Roadmap: Responsive AARTFAAC

Conclusions

- 6-station AARTFAAC now piggybacking on LOFAR observations.

- Calibrated images at 1s/subband cadence generated in real-time, processed offline in TraP.

- Robust control and monitoring system in place.

- Moving rapidly towards 12 station, 32 subband final system.