Quality assessment of LOFAR data

A JOURNEY THROUGH LOFAR CALIBRATION WOES

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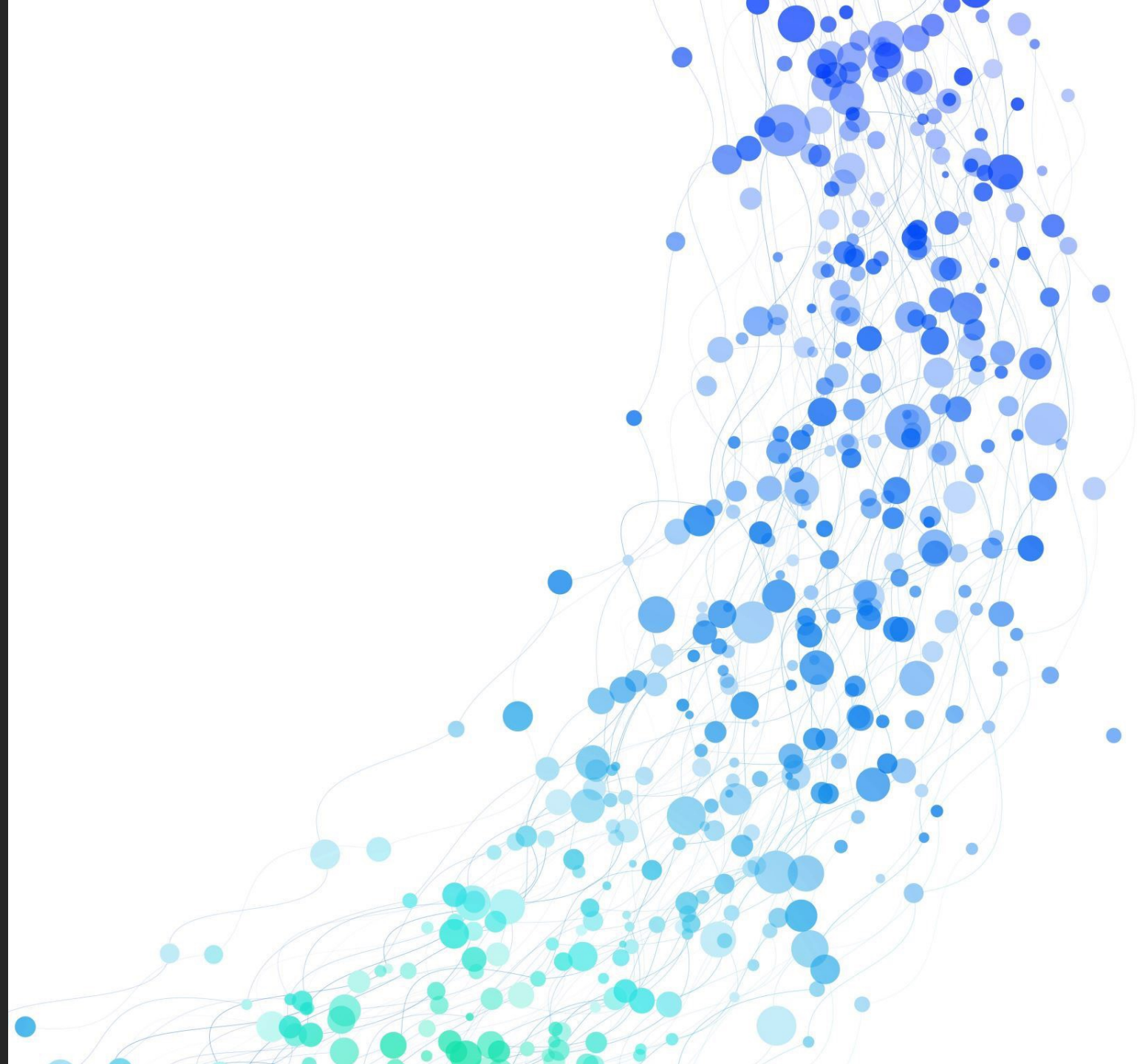
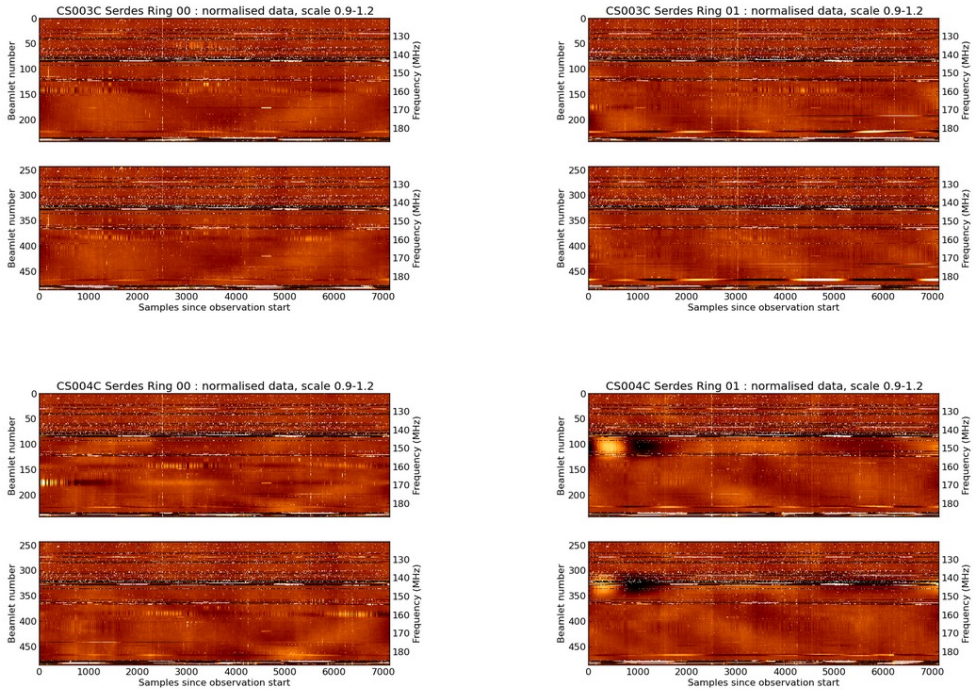


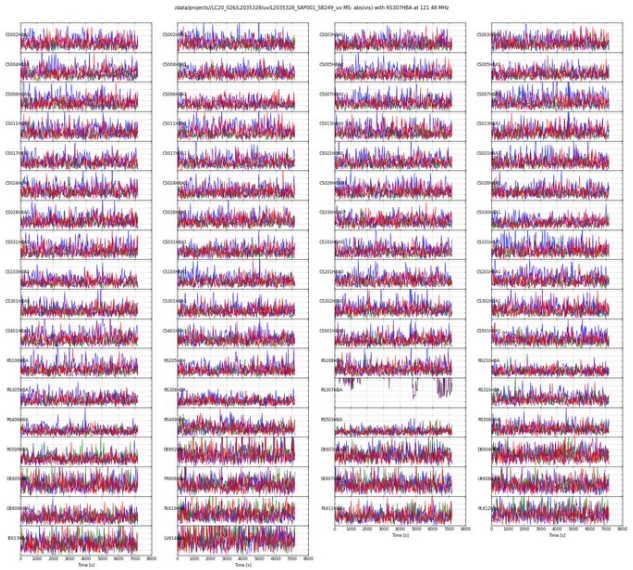
Goal of this tutorial

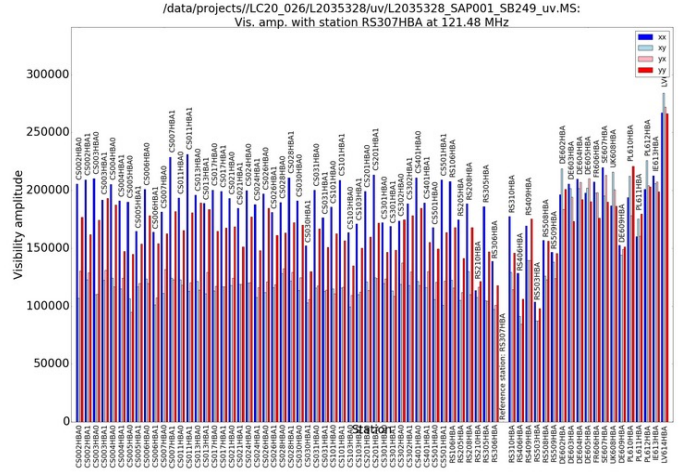
- Given a set of diagnostic plots from:
  - Raw data
  - The DI calibration pipeline LINC
  - The DDE calibration pipeline RAPTHOR
- Perform quality assessment of a given (interferometric) dataset

Raw data quality inspection (HBA or LBA)



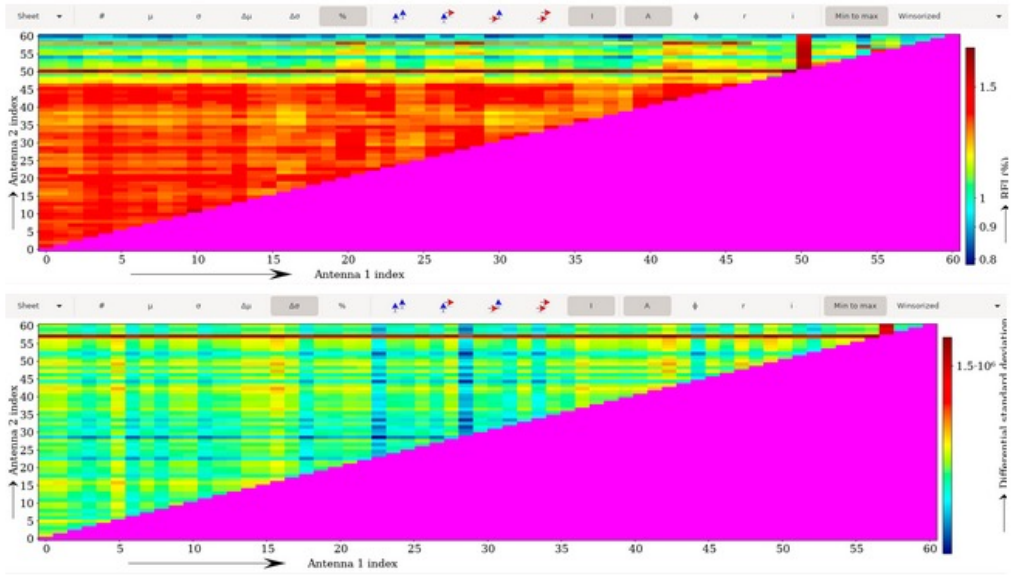
Dynamic spectra plots of beamlet statistics per station
Beamlet = single station beam per sub-band



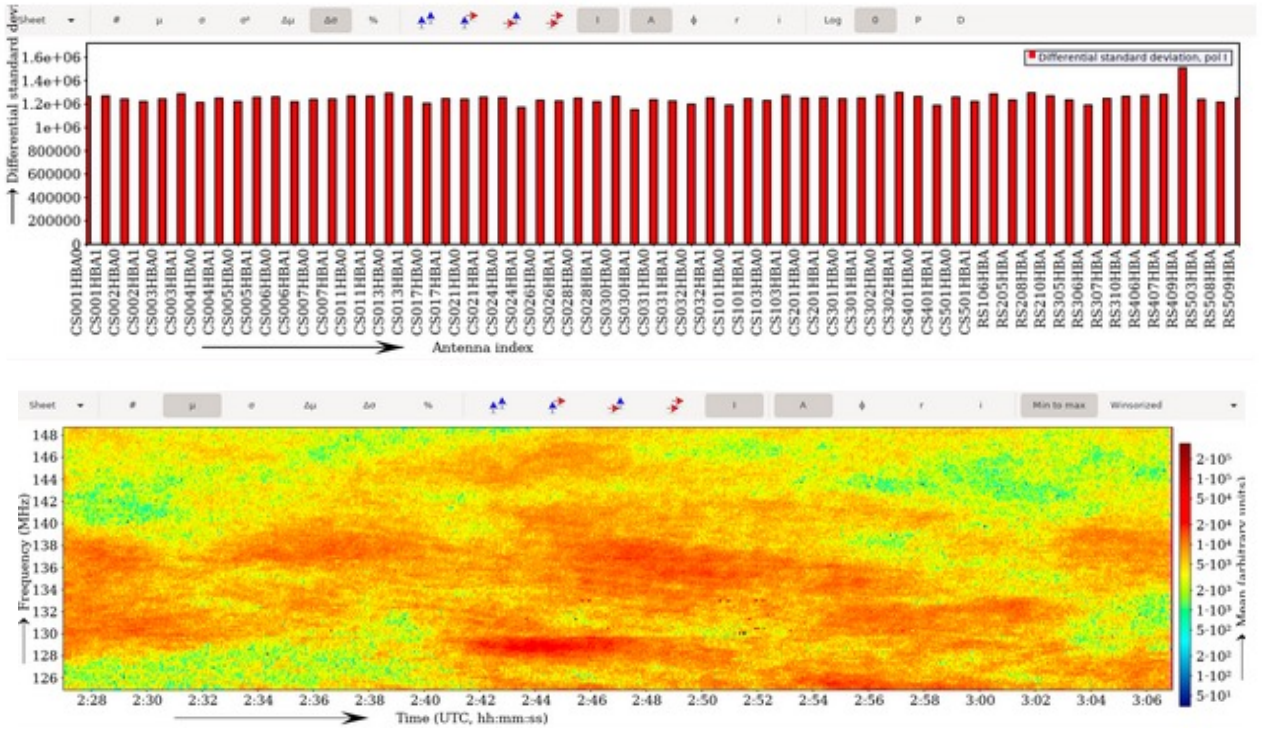


Visibility plots for all the baselines to a given station per sub-band

Raw data quality inspection (HBA or LBA)

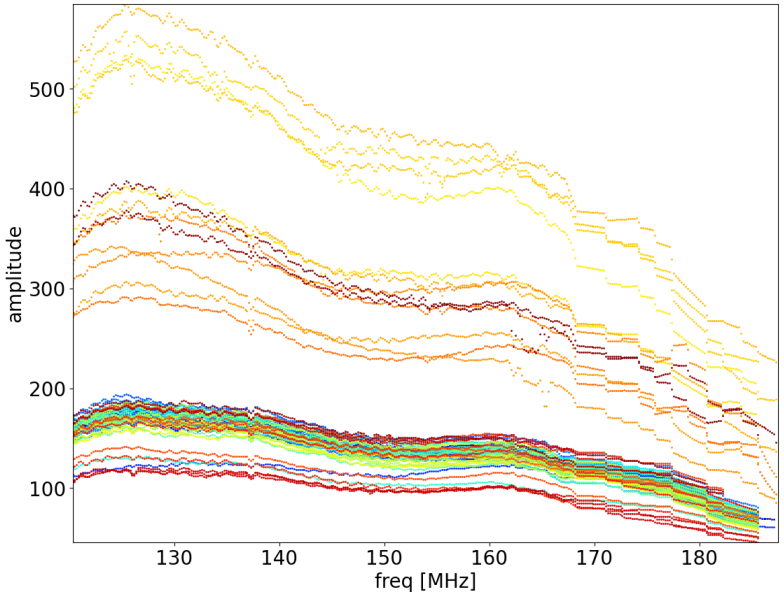


Standard deviation and percentage of data flagged vs. baseline



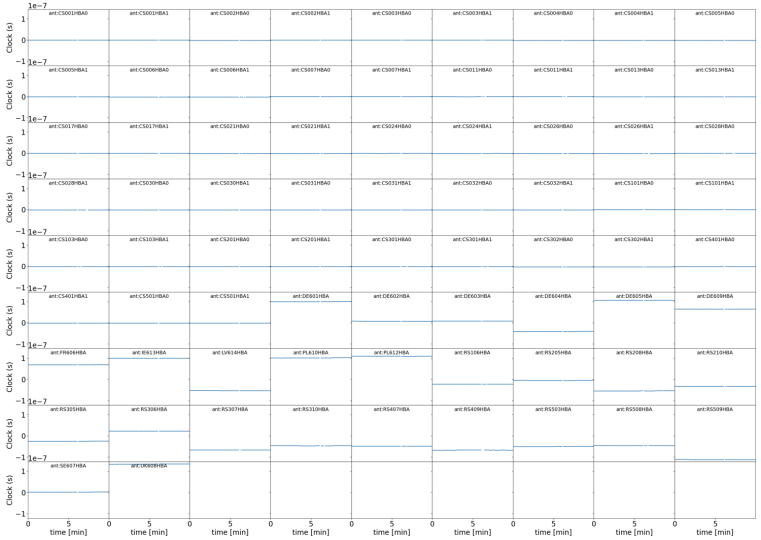
Standard deviation per station and dynamic spectrum of the data mean

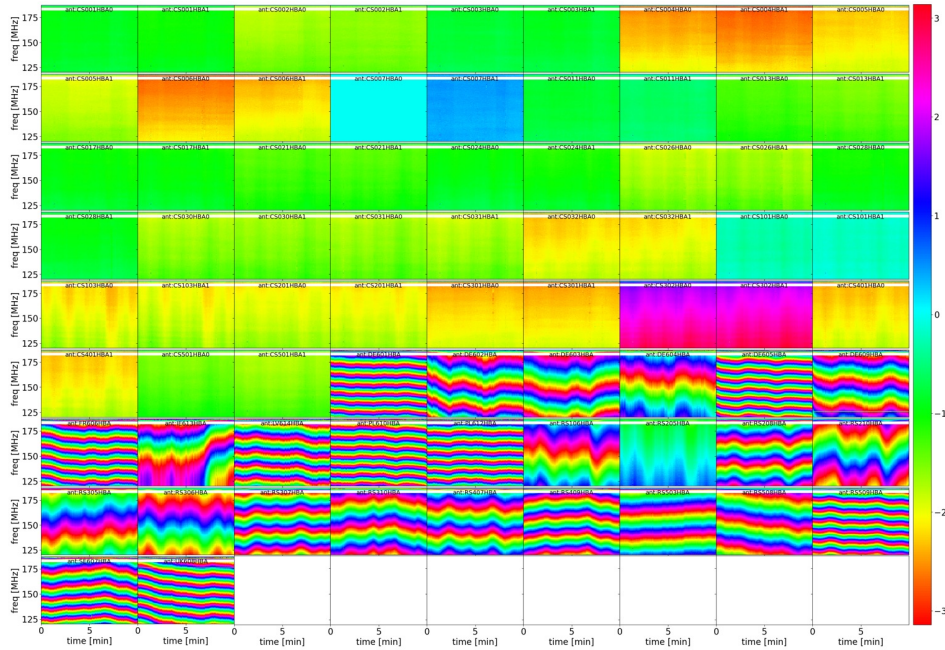
Diagnostic plots - LINC calibrator HBA



bandpass

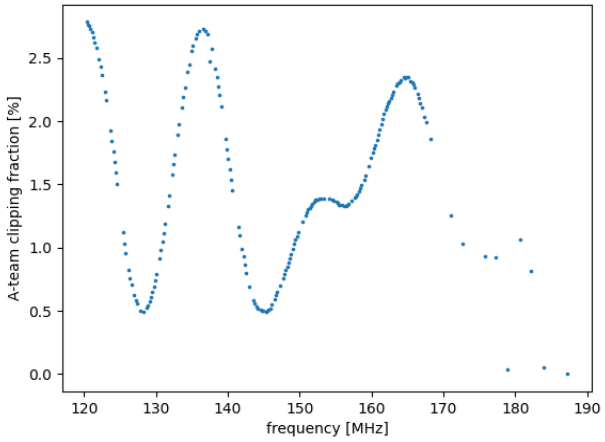
clock





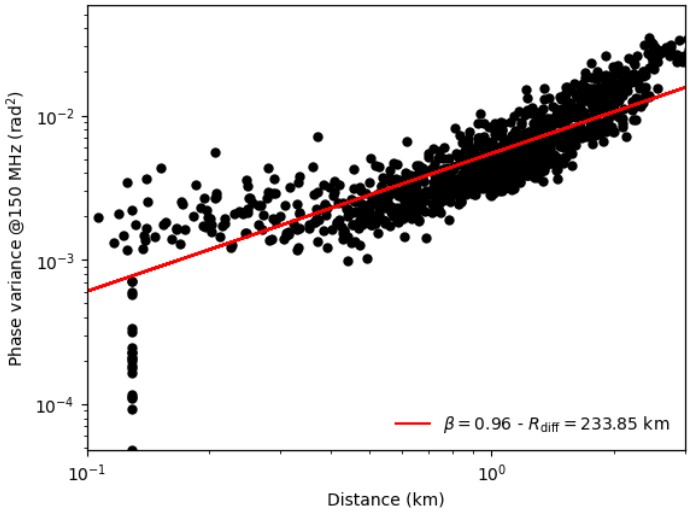
after polarization alignment:phase residual

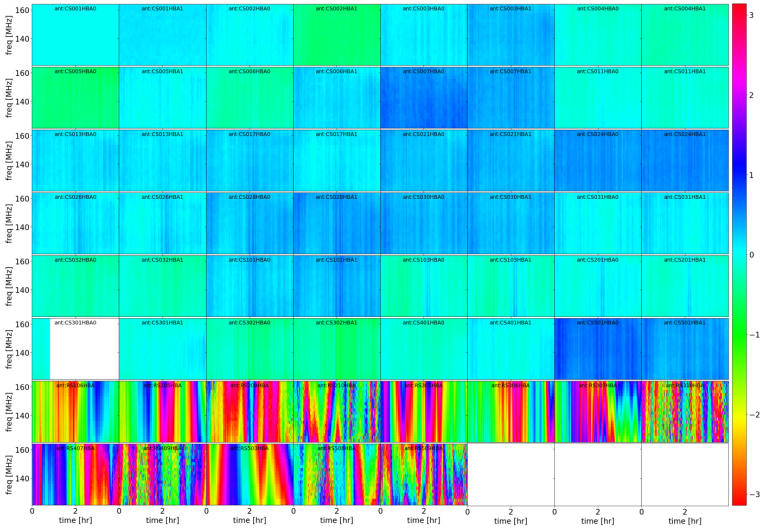
Diagnostic plots -LINC target HBA



data flagging

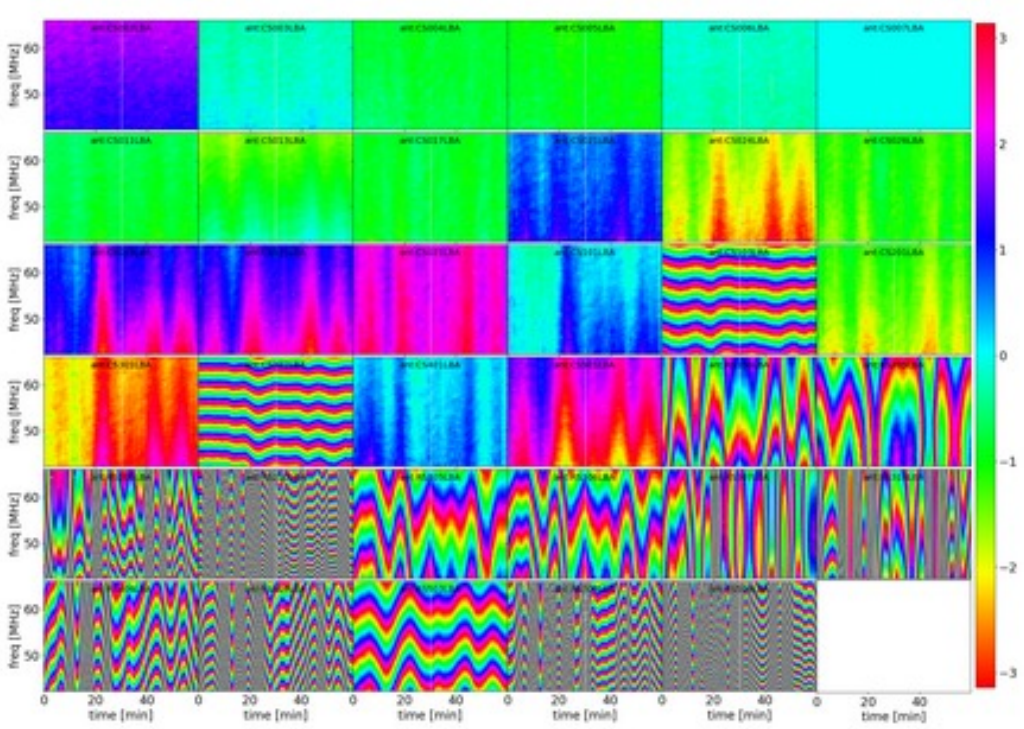
ionospheric state



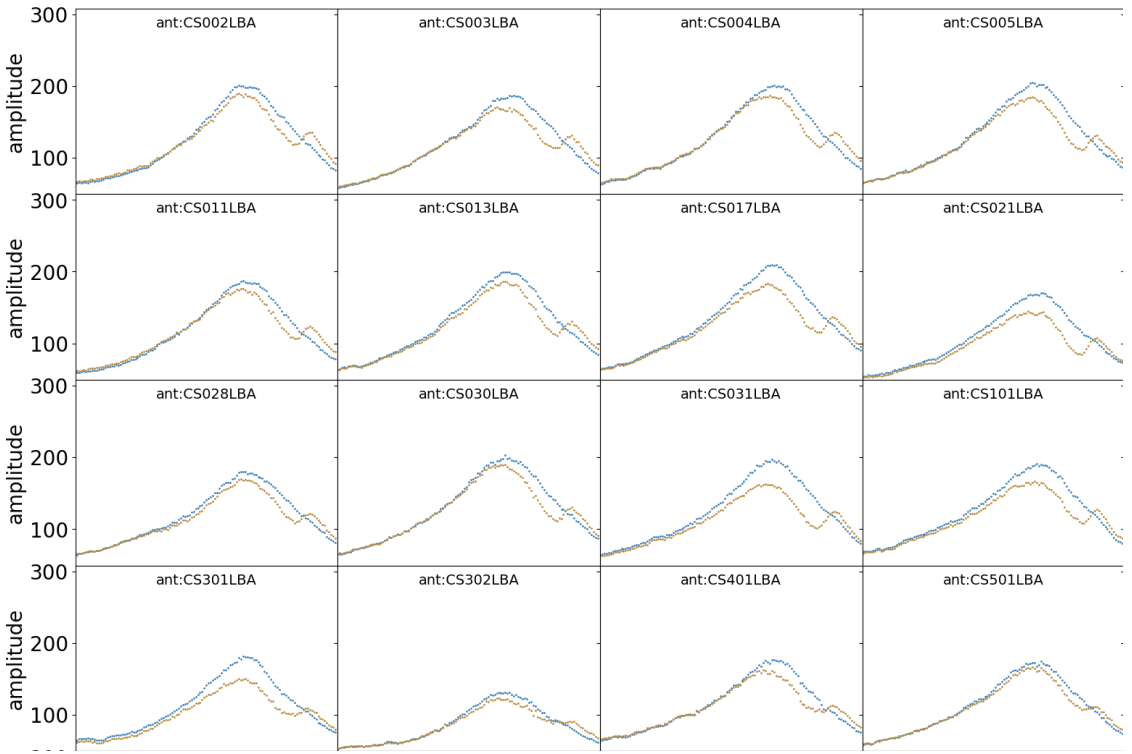


after polarization alignment:phase

Diagnostic plots -LINC calibrator LBA

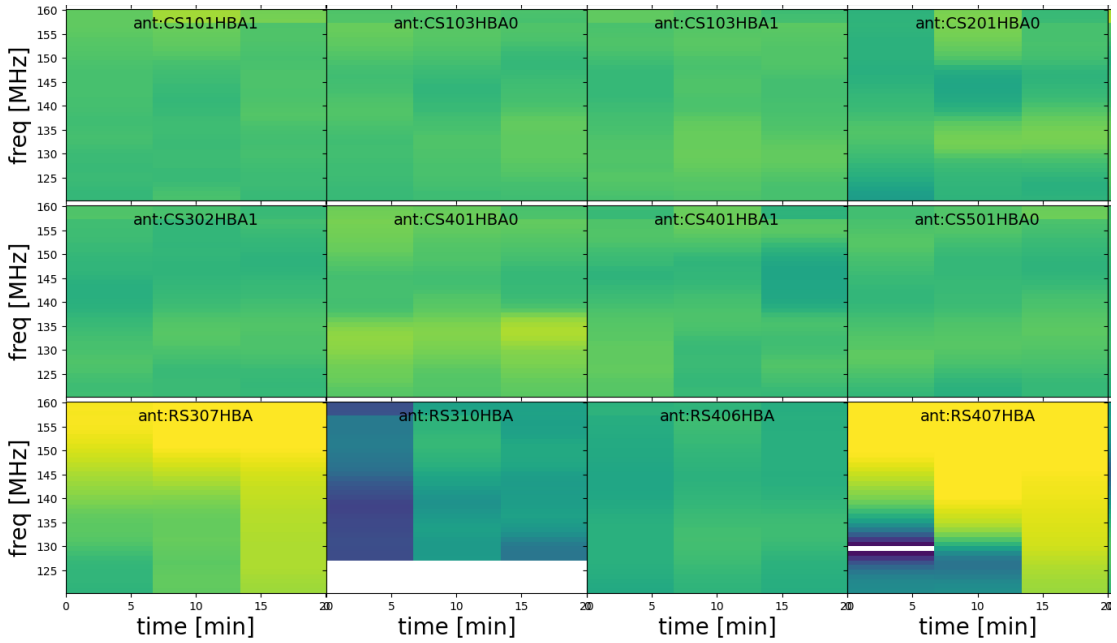


Phase: ionosphere plots

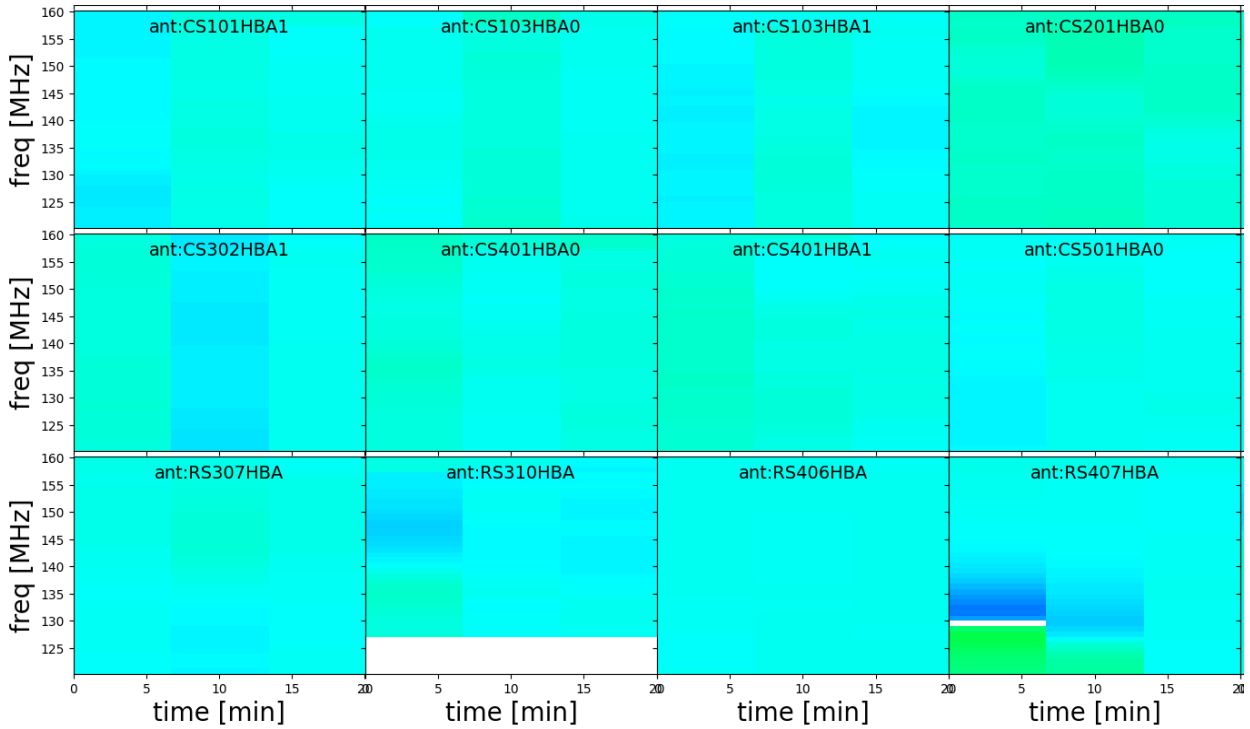


Bandpass

Diagnostic plots - RAPTHOR HBA

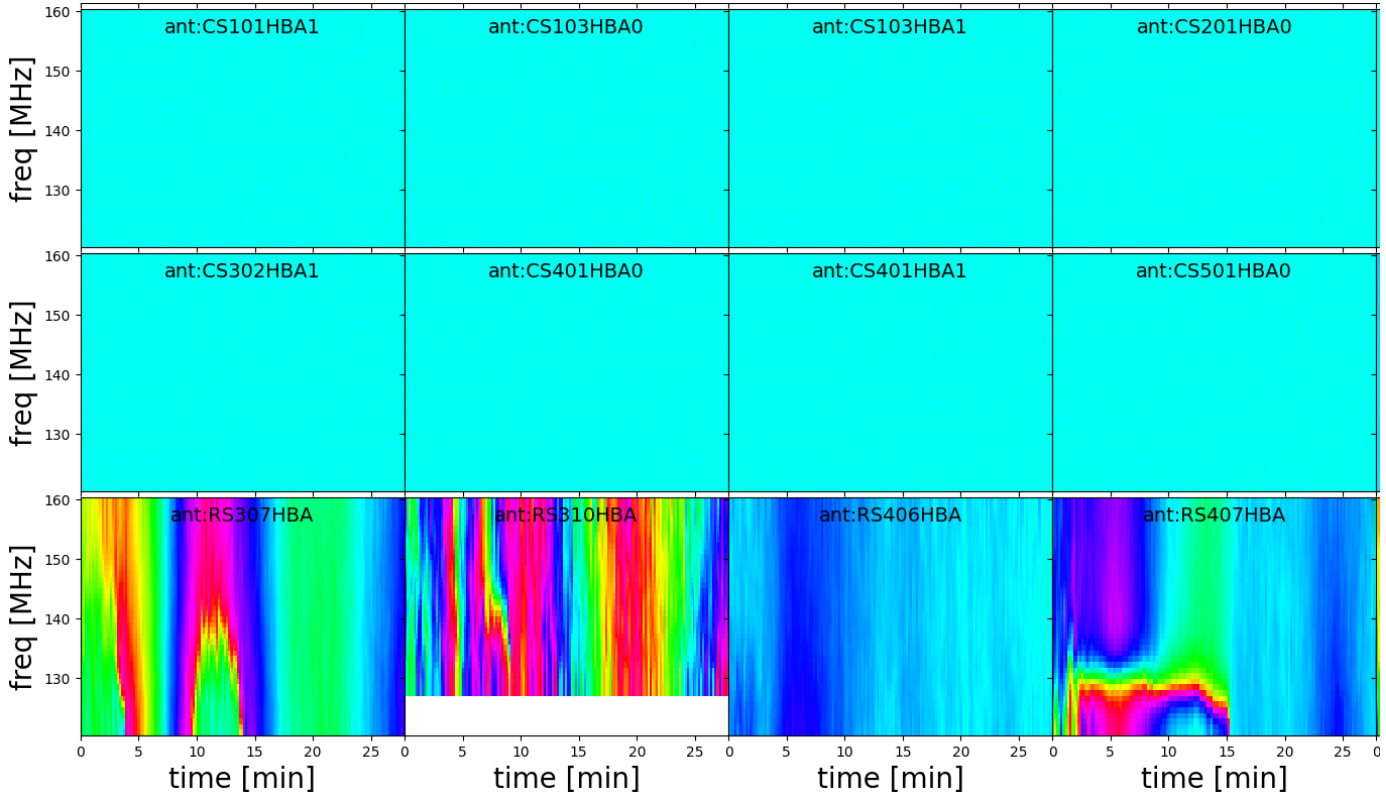


Amplitude: one direction XX polarization, 5th iteration



Phase – XX, same direction

Diagnostic plots - RAPTHOR HBA

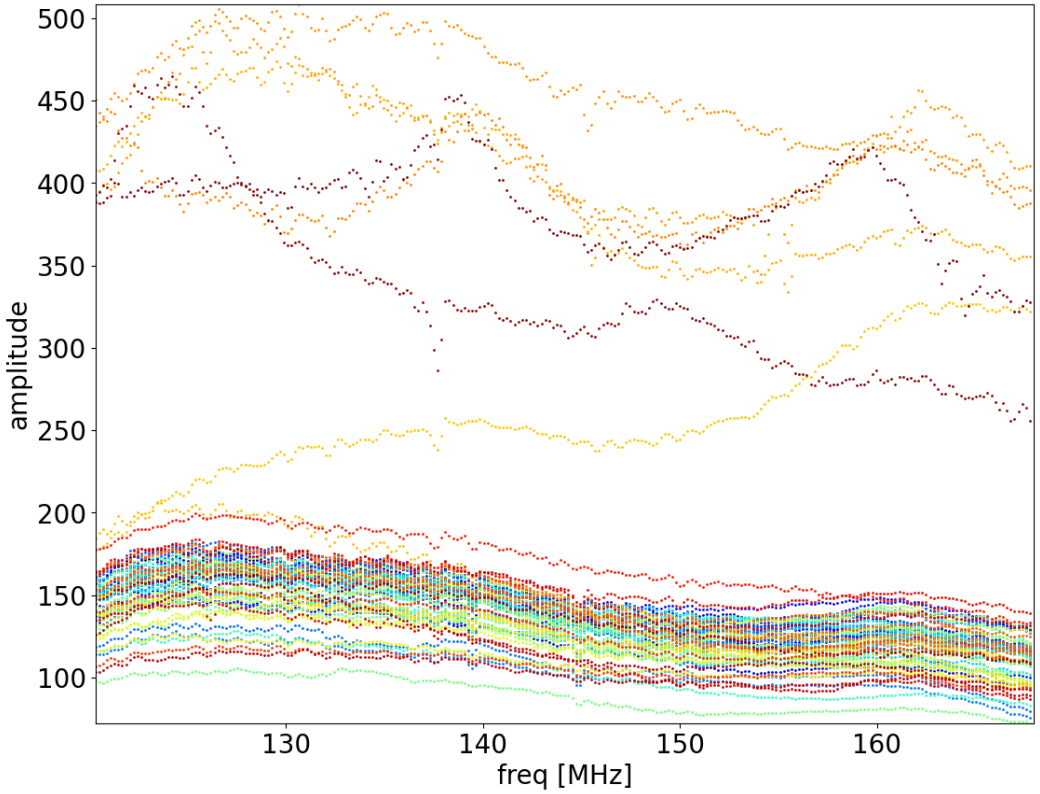


Scalar phase, 5th iteration one direction

Same for both XX and YY polarization

Q/A

Patterns


amplitude
500
450
400
350
300
250
200
150
100
130
140
150
160
freq [MHz]