

LOFAR operations update & bug status

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LOFAR status meeting 20081112

- 1 Operations update
- 2 Current bug status
- 3 Plans for next two weeks

System

- RSP firmware update to BP/AP version = 5.3/5.3
- Some antennae at CS016 will be repaired today

Observations

- TBB experiments (Mattheijs Eikelboom)
- Frequency mosaic (Pandey)
- Live demo for director general of science and higher education of department OC&W
- PSR B0329+54 with four simultaneous single tiles

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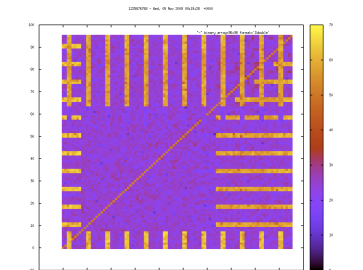
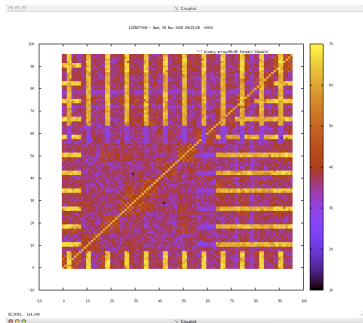
Old

- Pulsar S/N drop in time/freq (Most likely identified, see Hessels' talk)
- TP variations/ionospheric absorption (Ger de Bruyn)
- Unreliable tile HBA delay read back (Ruud Overeem, possibly solved, new software will be tested shortly)
- LBA RFI at fixed frequency combs (20 channels, no-one working on this)
- No fringe at long baselines (James Anderson)

New/questions

- CS010 unreliable/needs repeated commands before settings “stick”
- Why do we use boards 0, 5, 6, and 7 for output on CS010 instead of 0, 1, 2, and 3?
- Non-hermiticity in ACM at 200 MHz clock
- Non-hermiticity in ACM blocks of intra-RSP board visibilities in waveform generator tests
- AC oscillations Pandey
- Automatic firmware flashing after watchdog times out.

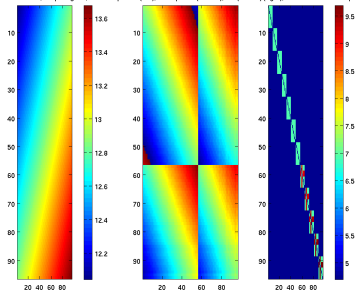
ACM problems at 200 MHz: combes



- Always same length
- End at RSP board responsible for XLET_OUT
- Occur mainly at boards 0, 1, 2, 7, and 8, but occasionally at other boards too (e.g. 11)
- Both in firmware page 14 (previous) and 15 (current, 5.3)
- PPS_DELAY 1000 or 2000 made no difference
- rspclear did not help
- system reset (swlevel 0) did not help

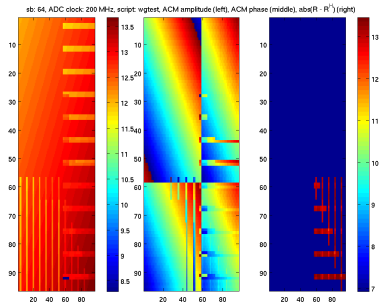
ACM problems at 200 MHz: 180° phase shift

142, ADC clock: 200 MHz, script: wgttest, ACM amplitude (left), ACM phase (middle), abs(R - R^T) (right), blocks in and out of phase every other



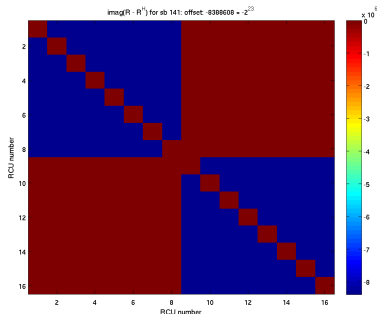
- Occurs every other channel
- Does not destroy hermiticity of ACM
- $n \times 512$ sample offset?
- Best seen in waveform generator test

ACM problems at 200 MHz: crosses



- Includes non-zero imaginary parts of autocorrelations
- Limited to small set of RSP boards (those suffering from combs from two sides?)

ACM problem at high signal levels: constant offset



- Only in waveform generator test
- $\|V_{ij} - V_{ij}^*\| = 8388608$
- Why special: $8388608 = 2^{23}$
- Conversion from 54 bit signed integer to 32 bit custom float with 30 bit mantissa?

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Next two weeks

- Verify hba-delay read back fix (Ruud Overeem / Michiel Brentjens)
- Repair ACM problems at 200 MHz clock (Eric Kooistra)
- Repair watchdog problem (Eric Kooistra)
- Pulsar busy week / fix HBA station beam tracking (Pulsar group, Ruud Overeem, Pieter Donker?)
- Repeat Pandey observations after RSP firmware fixes and see if peculiar AC problem goes away.
- Resume observing of other proposed projects