Analysis on Cylinder Calibration Data

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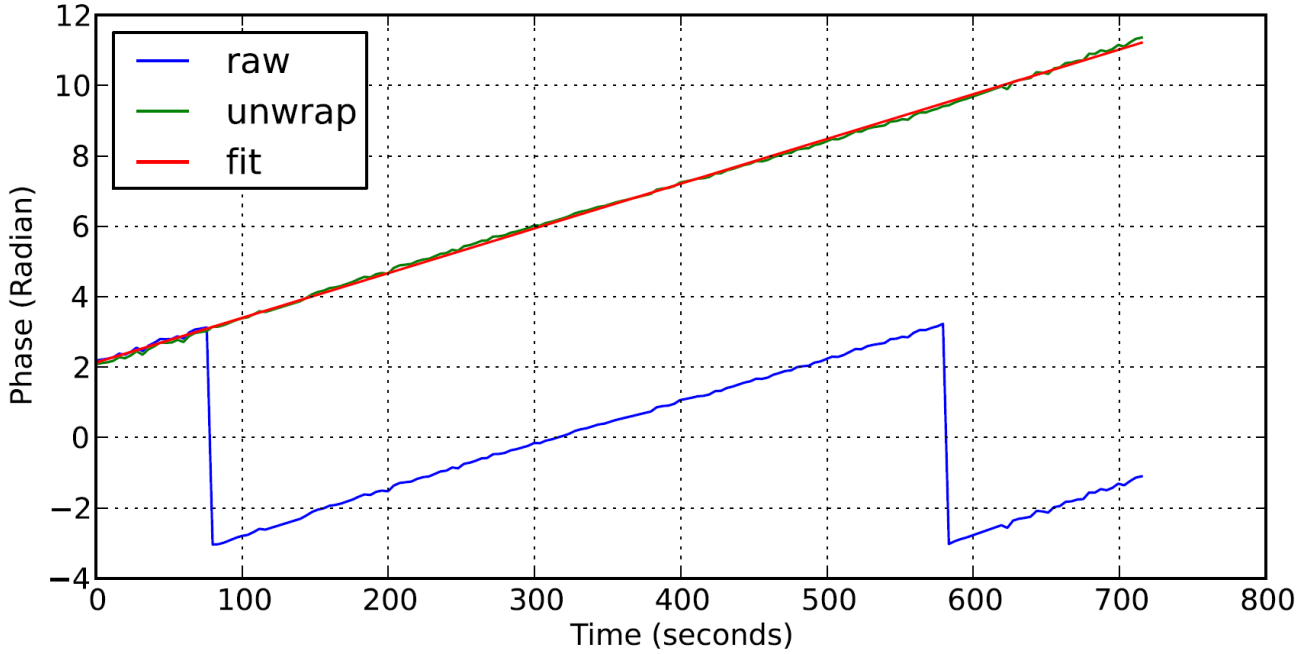
Data Information

- 5 days observation on Sept. 27th, 2016
- 20 frequency points(748.8428~751.1621 MHz)

- TODO
  - Use data in different months/years
  - Full frequency

Conjugate check of the correlator output

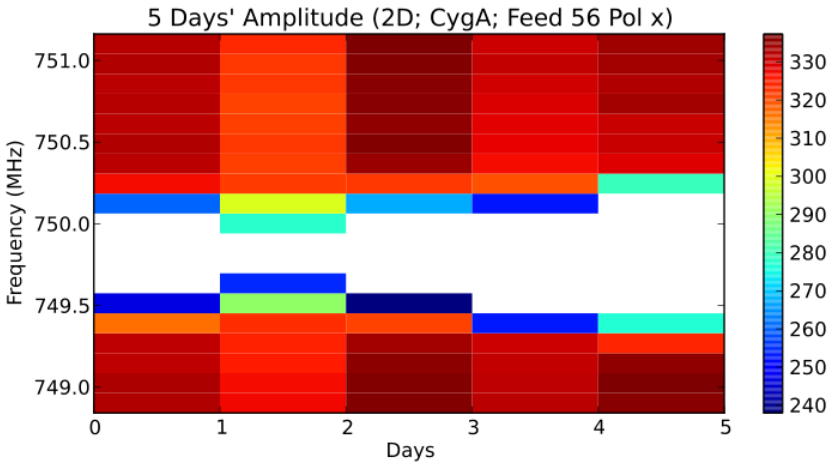
- Regime $V_{mn} = A\exp\left(-j2\pi\vec{B}\cdot\vec{n}\right) = A\exp\left(-j2\pi\left|\vec{B}\right|\cos\theta\right)$
- Expect a decreasing phase in visibility.
- Check the phase of raw data.



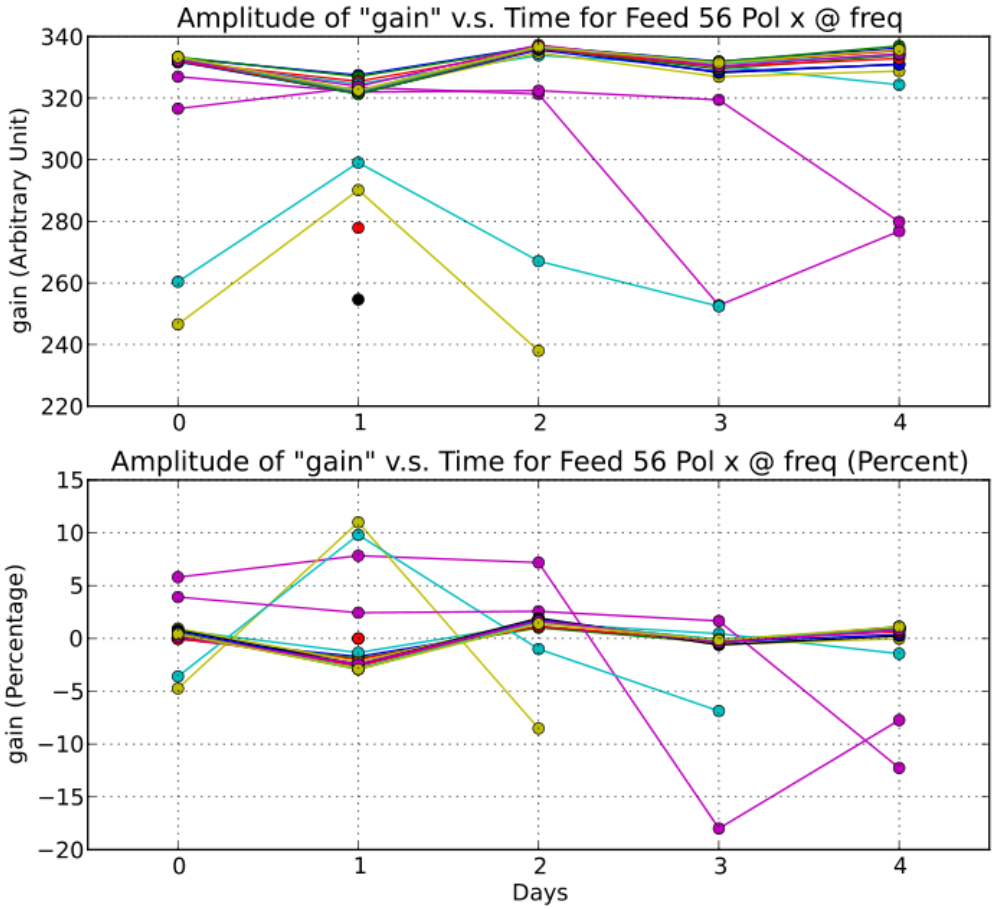
Cygnus A transitting phase seen from baseline ch1-ch67.

- Works only for east-west baselines
- North-south baselines: Drone?

Stability check on system gain - amplitude

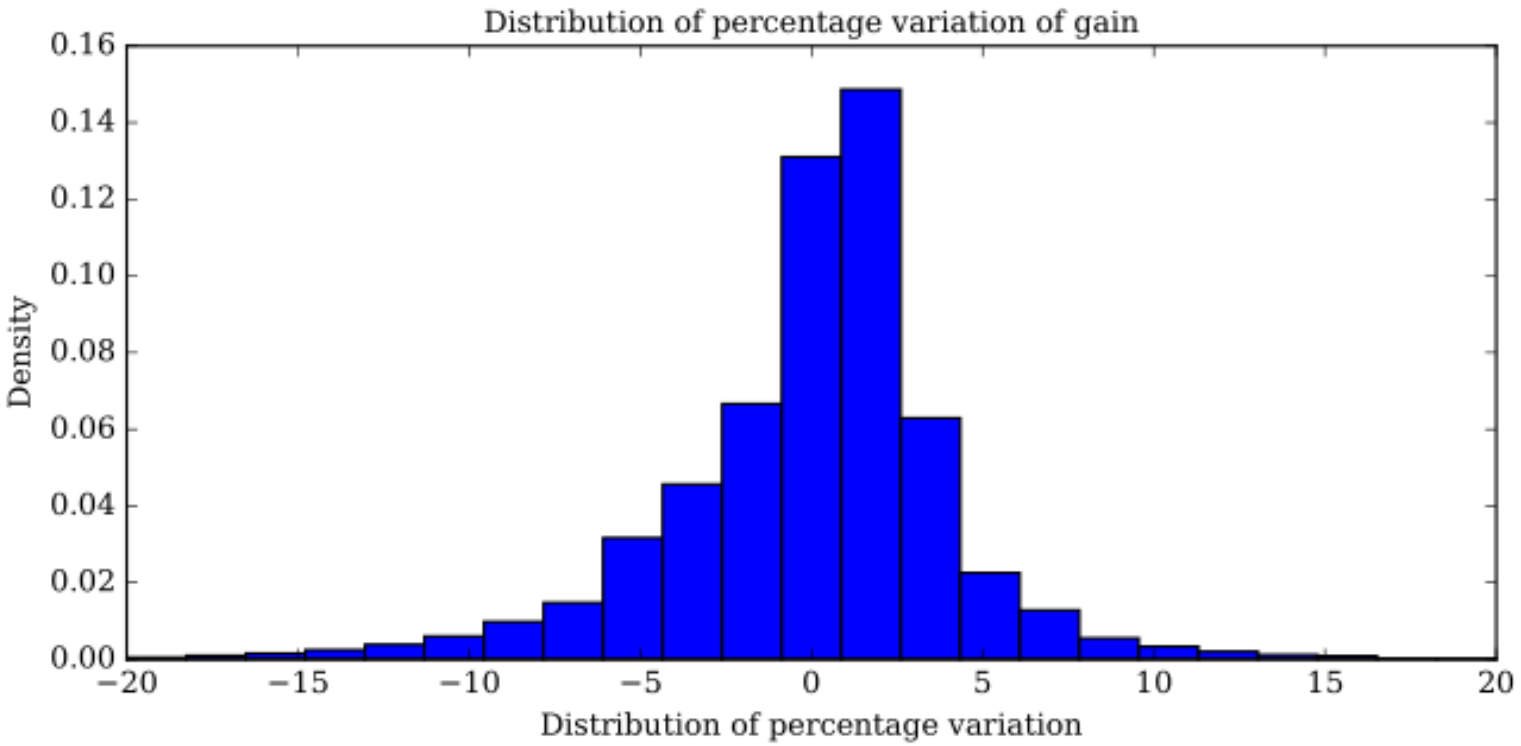


- 2D view of the calibrated amplitude of gain for channel $56x$ (calibrator is Cygnus A; white area are RFI polluted and have been removed.



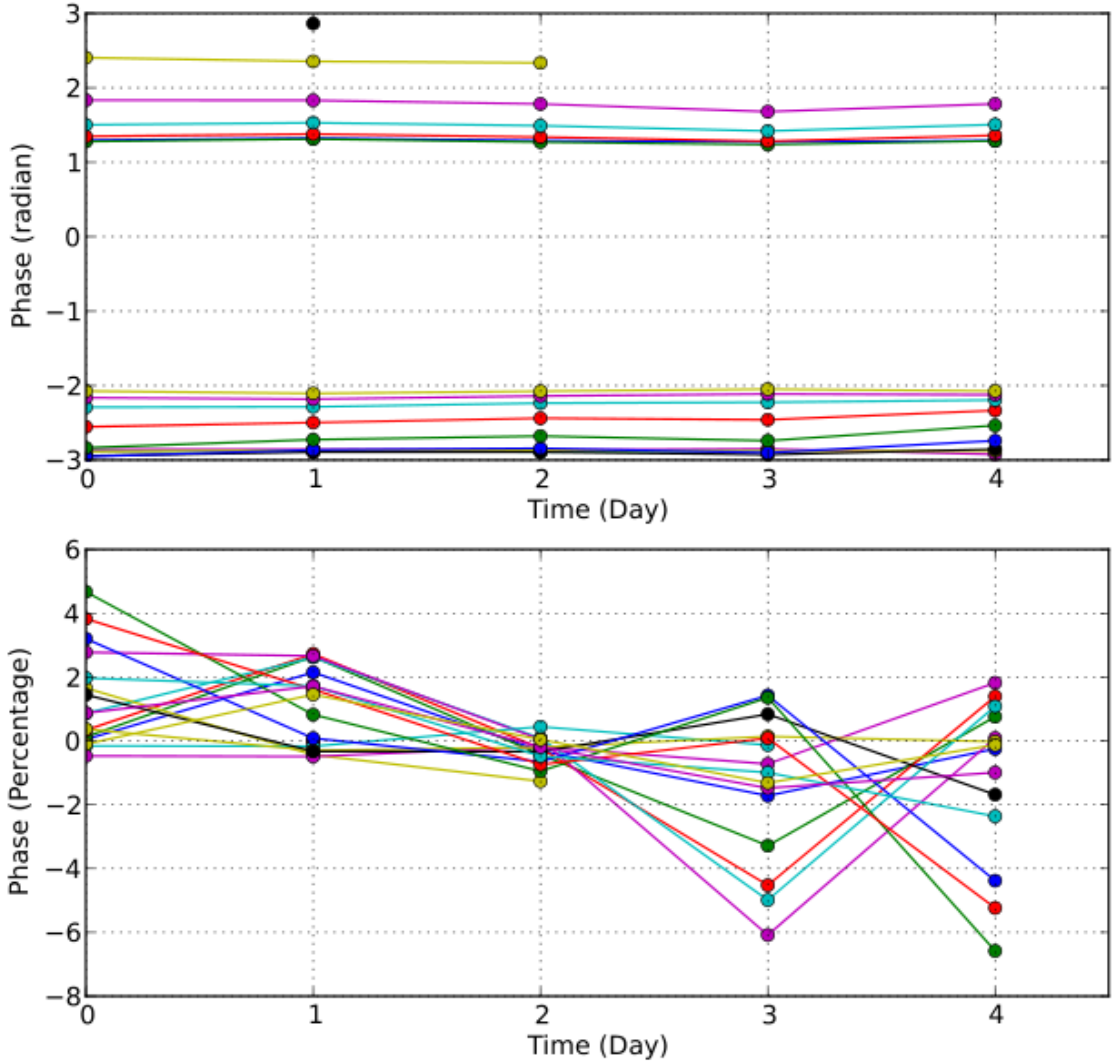
Top: 1D view of amplitude variation of gain of channel $56x$, different curves for different frequencies.
Bottom: variation of the gain in percentage.

Stability check on system gain - amplitude



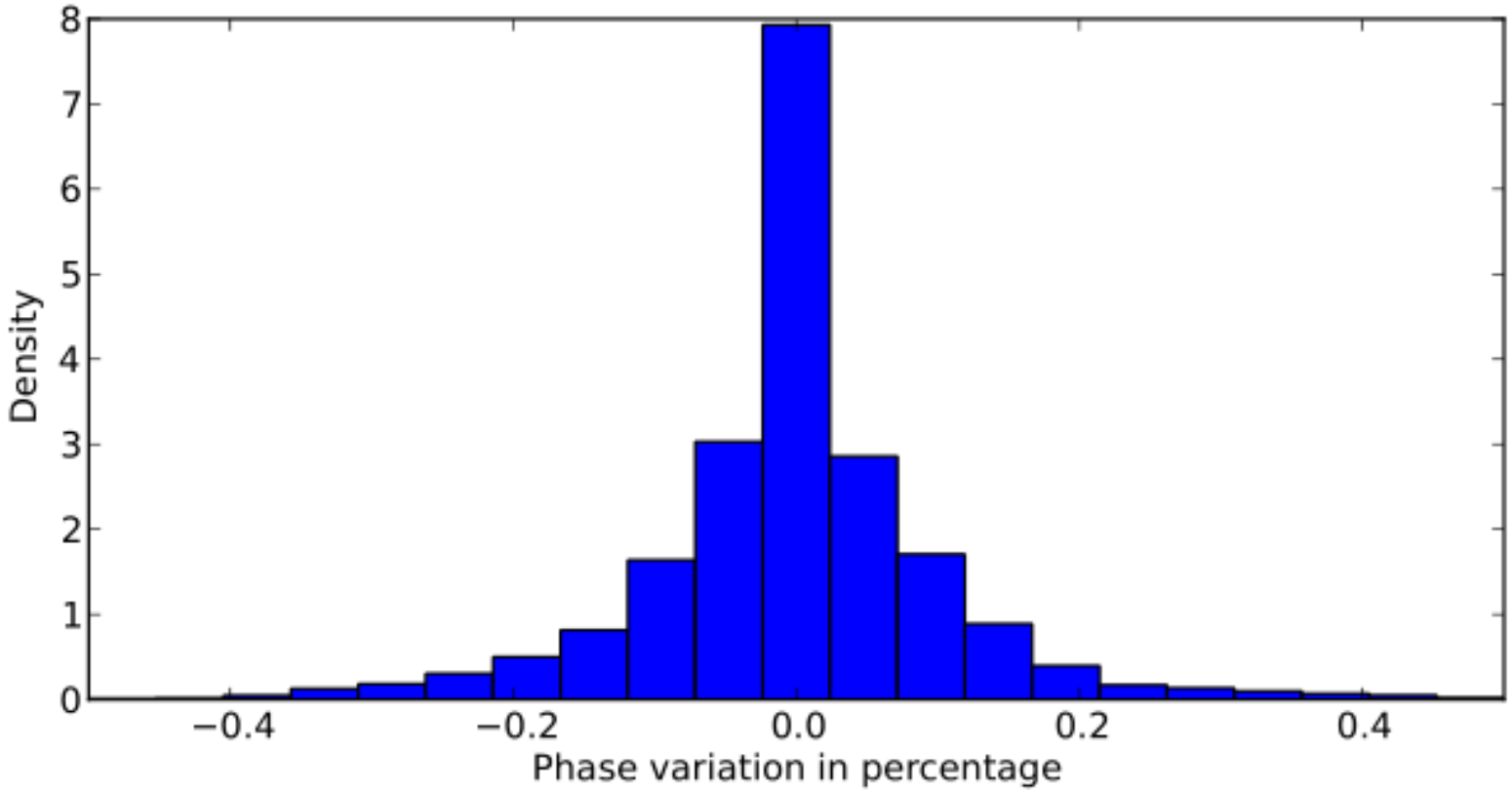
- Percentage distribution of gain variation of whole polarization channels and frequencies

Stability check on system gain - phase



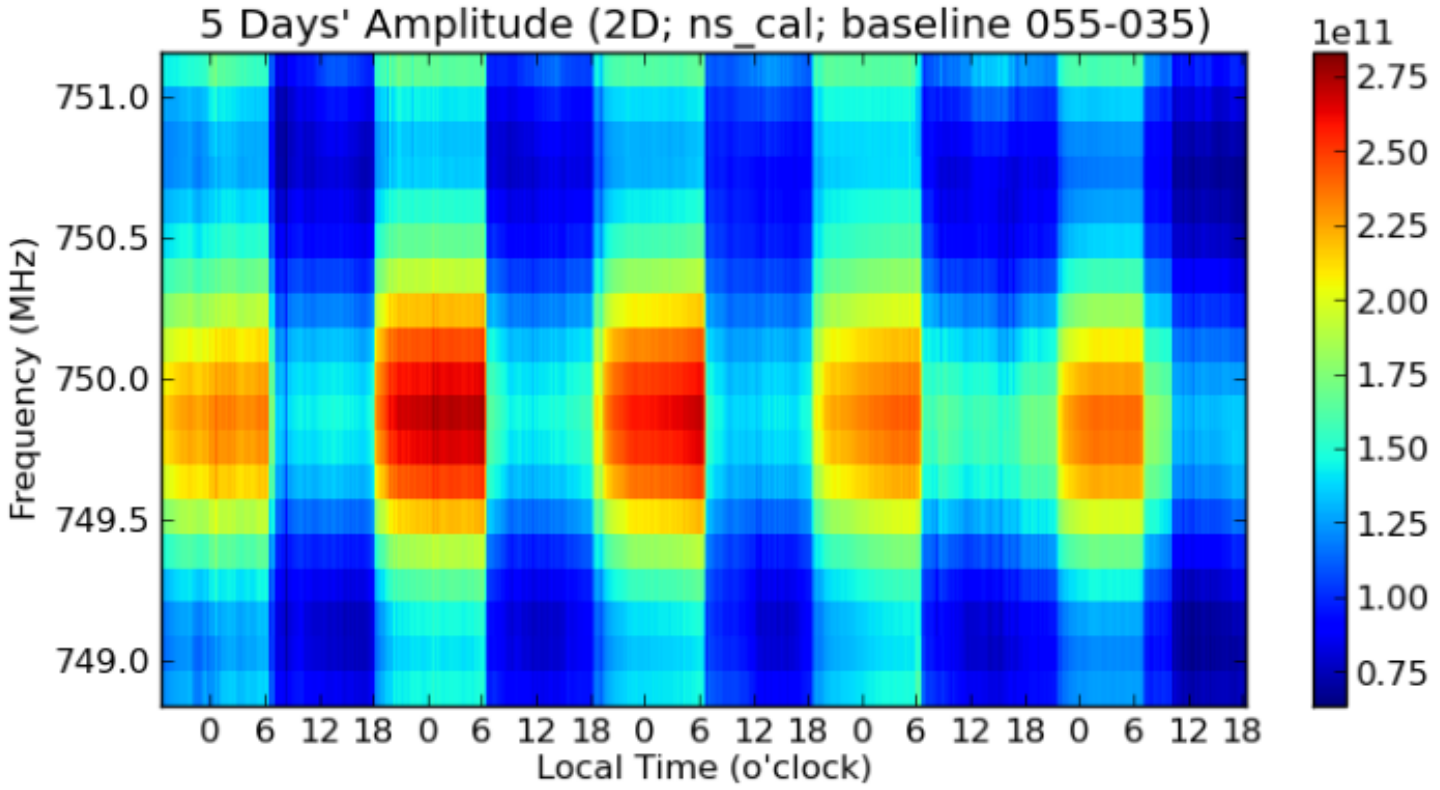
- Phase variation calibrated by Cygnus A of all frequencies of channel $5x$.

Stability check on system gain - phase



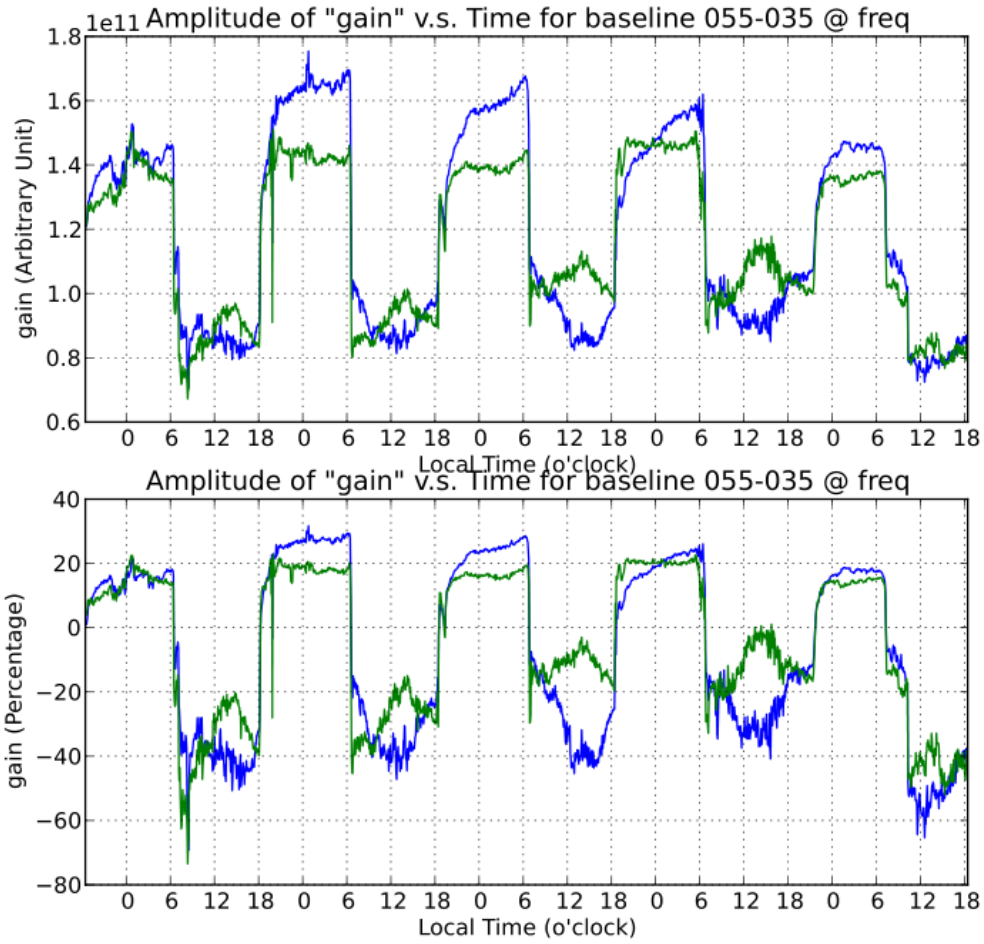
- Distribution of phase variatio calibrated by Cygnus A of all polarization channels and frequencies.

Stability check on system gain - phase



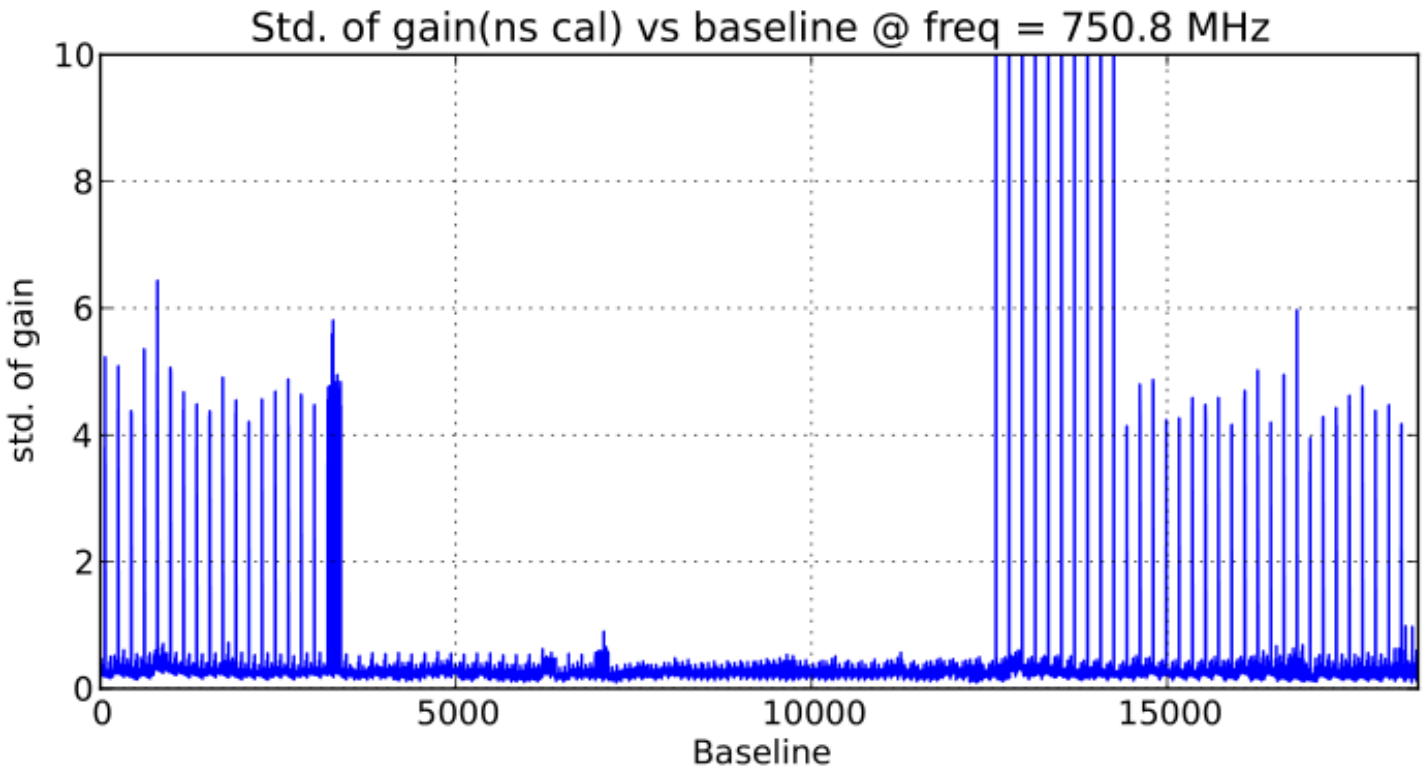
- 2D amplitude variation of gain calibrated by CNS (Calibrator Noise Source).

Stability check on system gain - phase



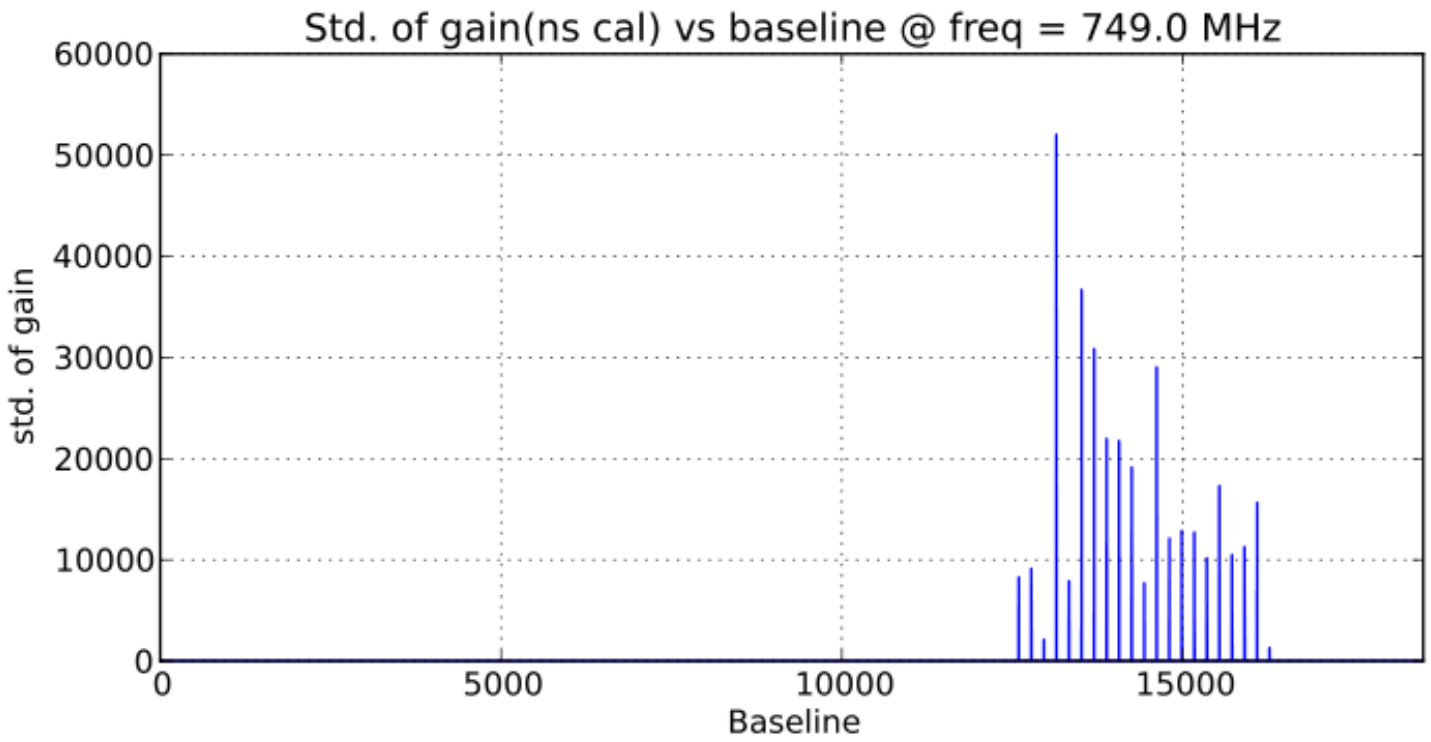
- CNS calibrated gain of baseline 55-35 at different frequencies.
- Raid change in morning and evening → temperature → amplifiers.

Uniformity check on system gain - amplitude



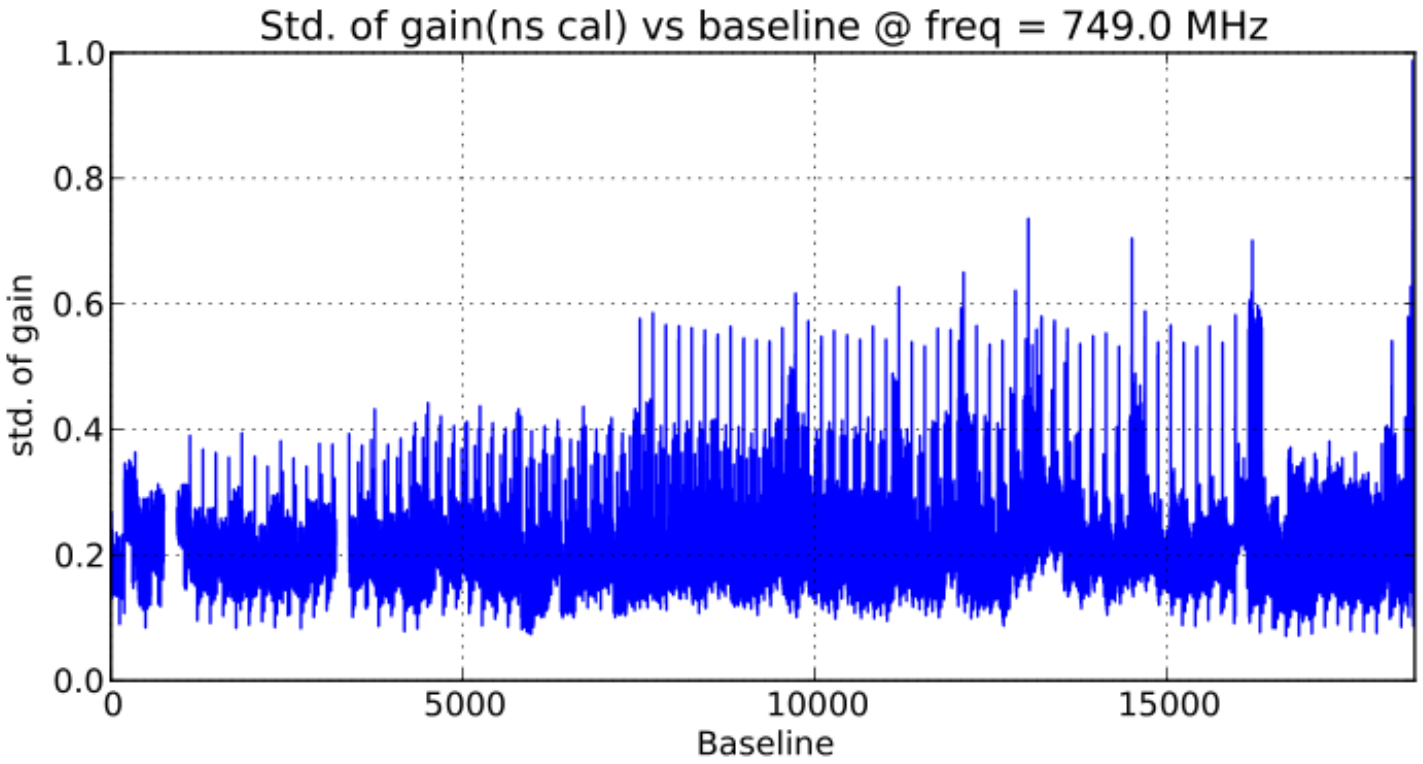
- Gain's STD. of all correlations at frequency 750.8 MHz.

Uniformity check on system gain - amplitude



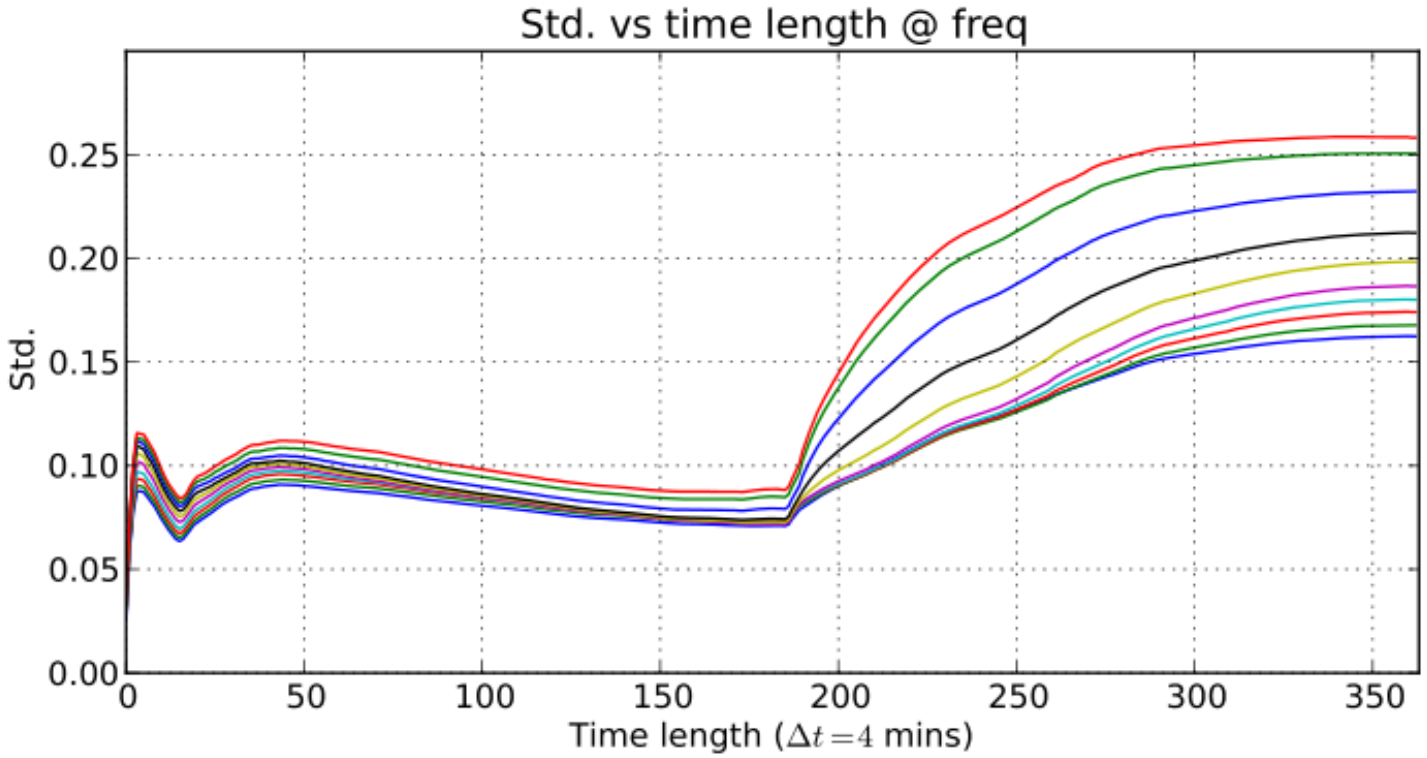
- Gain's STD. of all correlations at frequency 750.8 MHz.
- Extremely large STD.

Stability check on system gain - phase



- Gain's STD. of all correlations at frequency 750.8 MHz.
- Small STD.

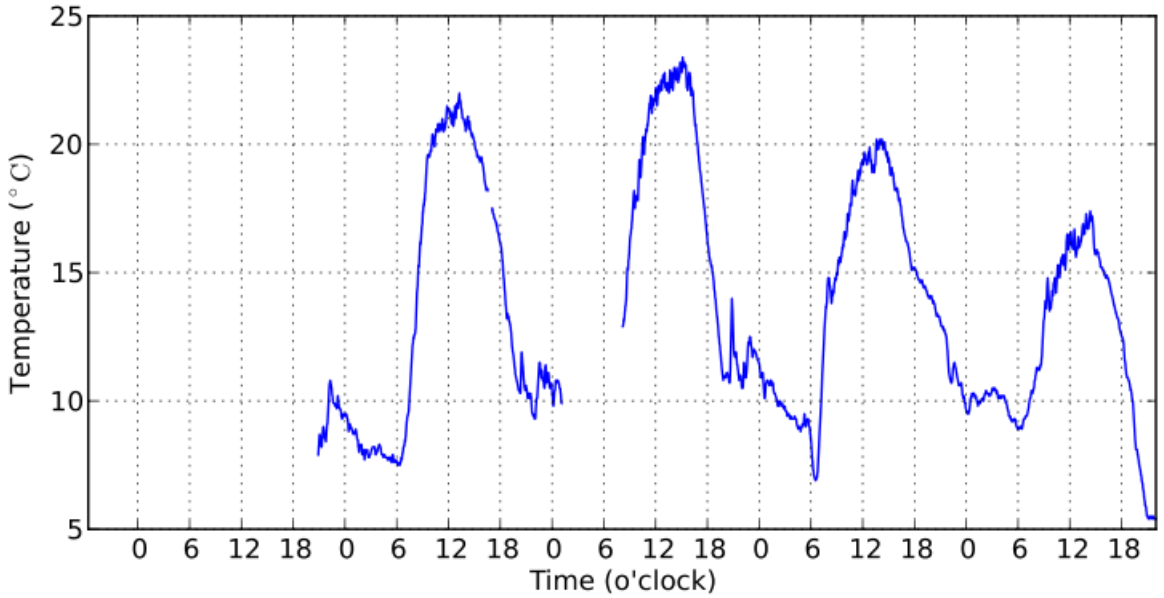
Stability check on system gain - phase

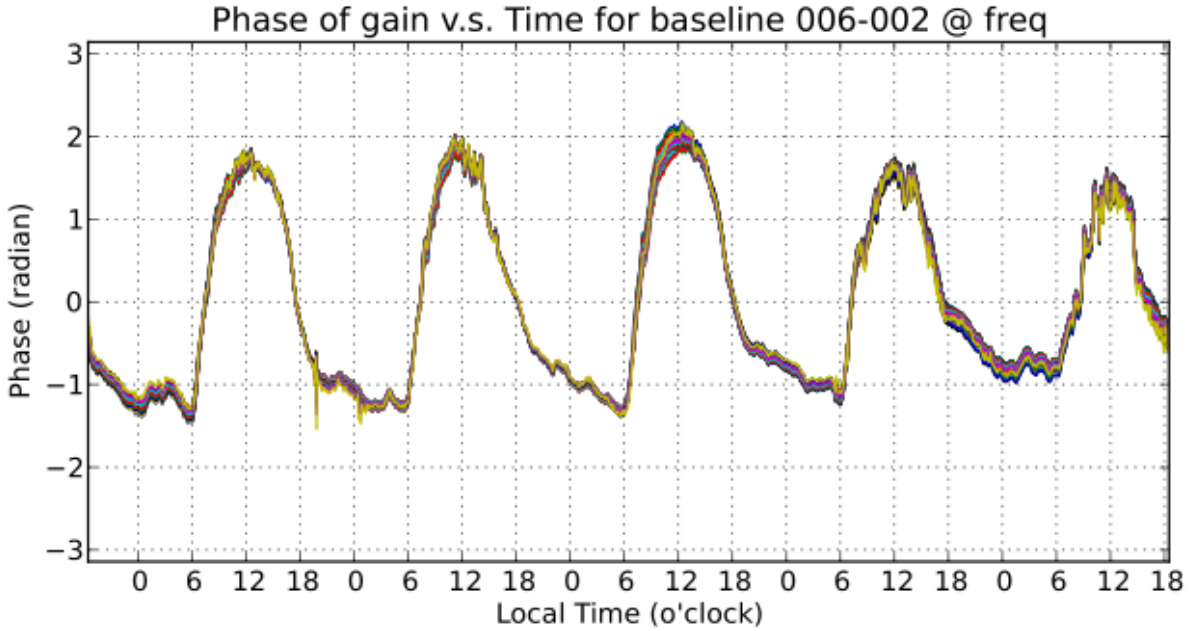


- Std. variation vs. different time lengths from one time bin (starts from evening) to one whole day.

Temperature vs gain's amplitude

- 1





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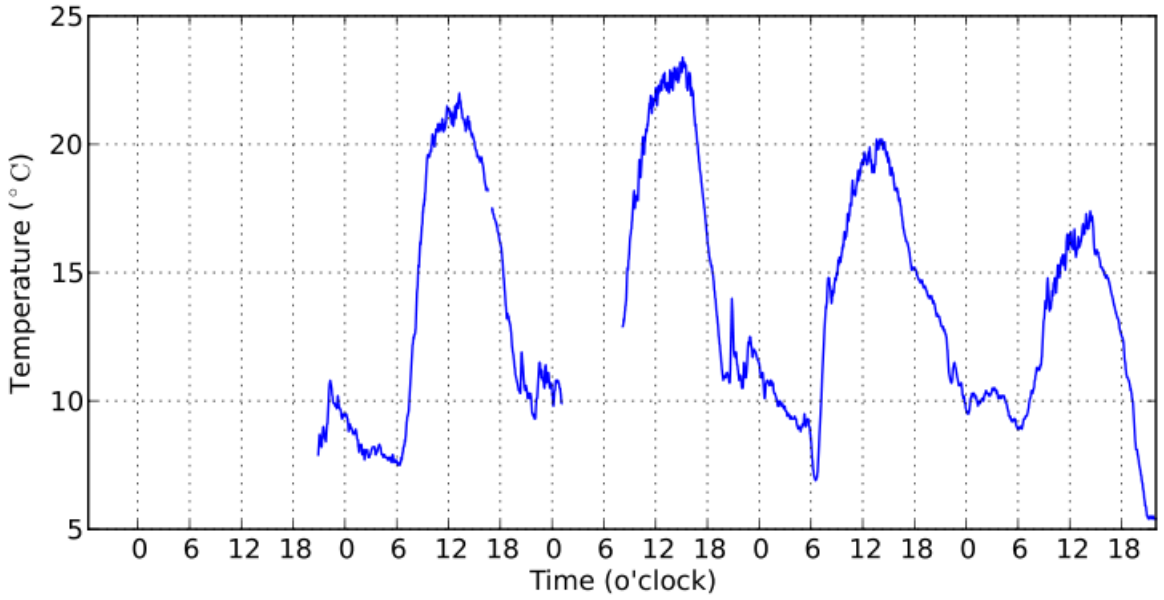

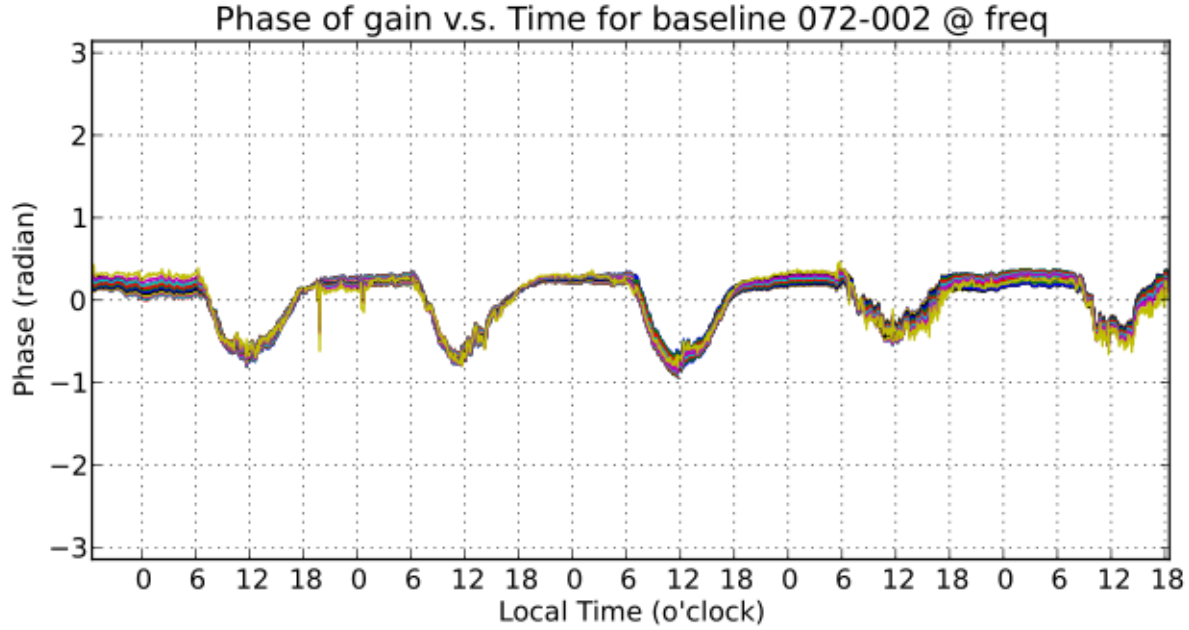

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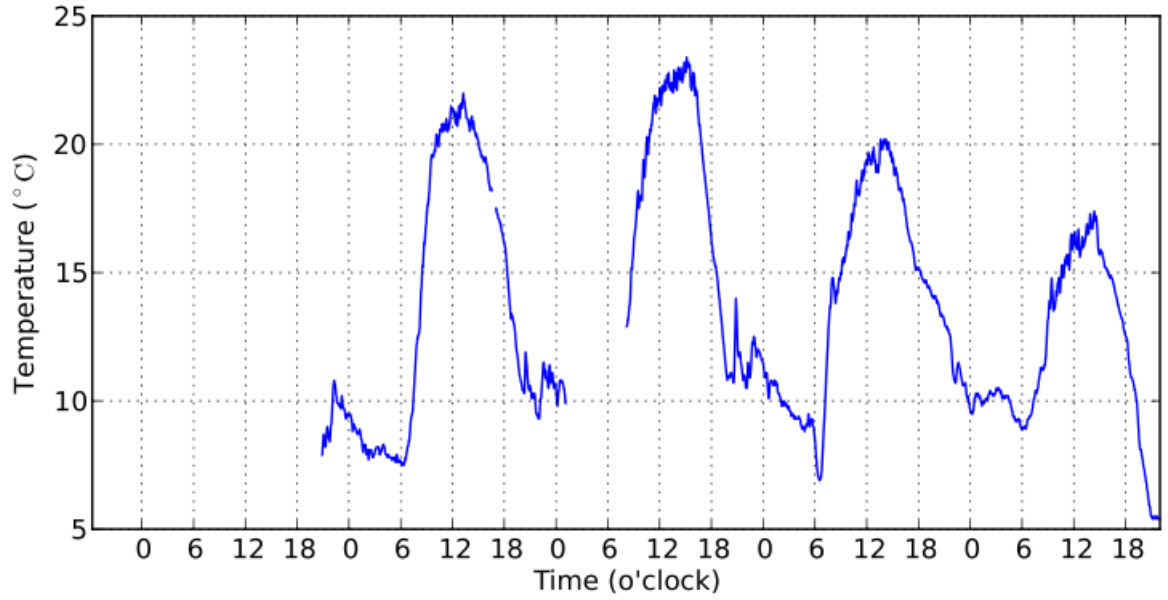

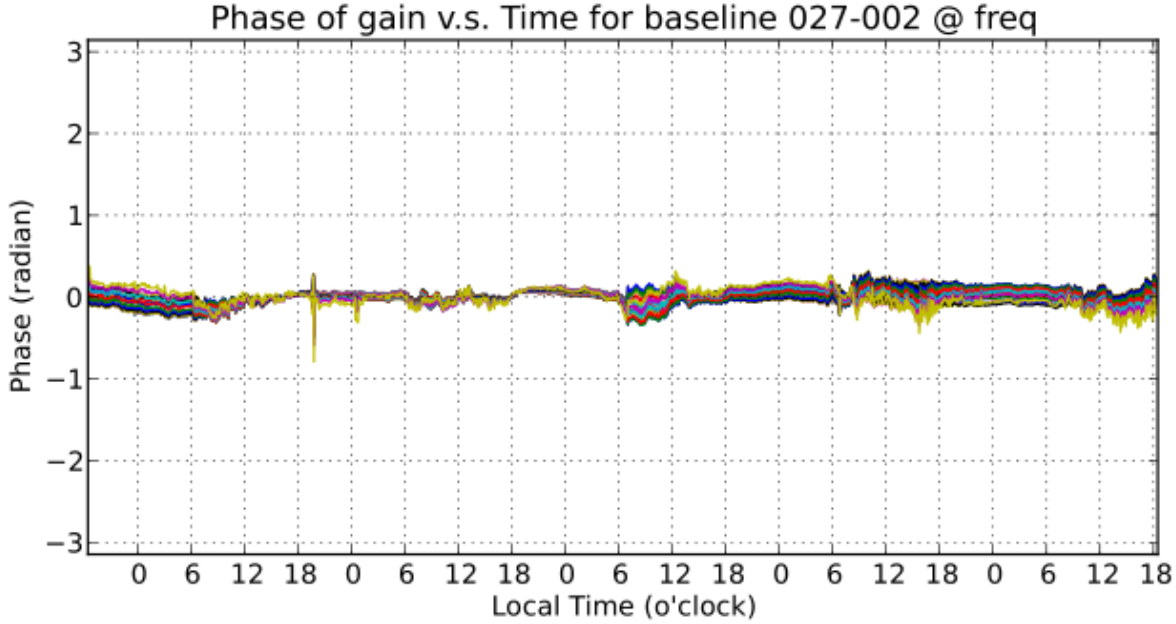

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