

Amas@Nançay

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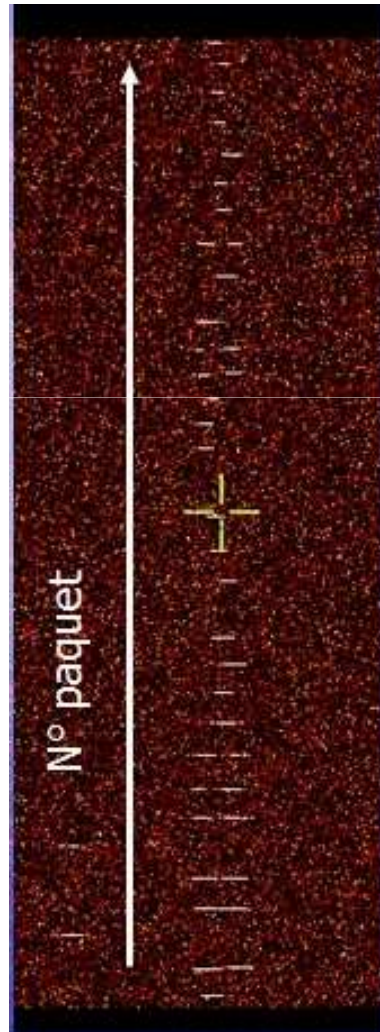
LAL-Orsay

9/11/11

Data acquisition

- **2 polarisations** at the focal plane of the Radiotelescope at Nançay, **equipped with the BAO-Radio electronics** [1250-1500] MHz
- 1st tests in July 2010: UGC4358 & 3C227/3C286
- Observation time: >60h Q1&2 of 2011 on Abell1205, Abell2240, Abell85. System tests: Jan-Mar 2011. Fully operational since April 2011.
- Data Transfer on Irods @ CCIN2P3: **75To**
- Semi-automatic analysis ongoing: band cleaning, spectra ON-OFF.
- **Goal: suppression of RFI, sensitivity, HI signal of Abell85 and if possible the other clusters...**

Time-frequency analysis



Acquisition rate 8~10kHz

Bandwidth [1250-1500]MHz

Binning ~30kHz (FFT on the fly)

Example of a RFI

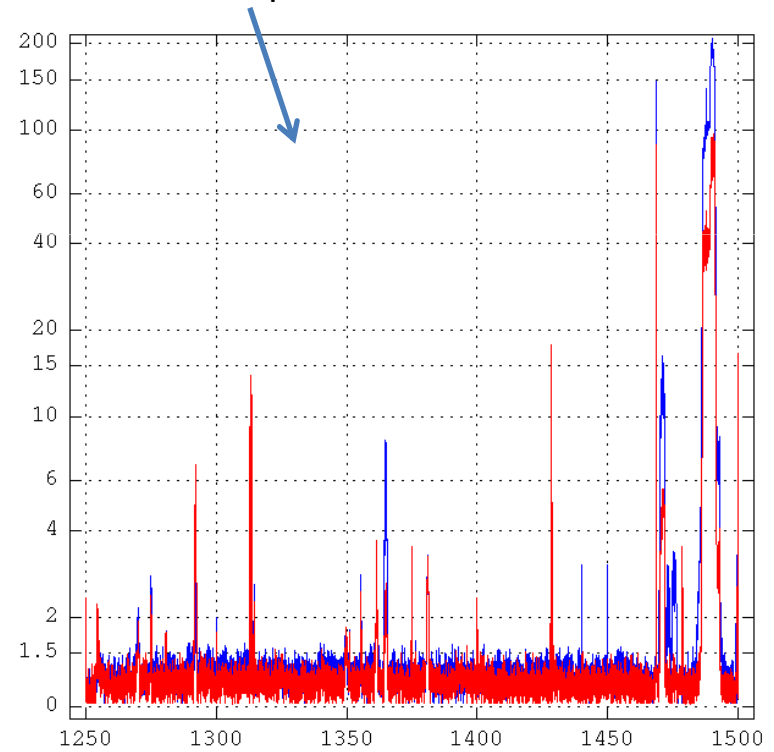
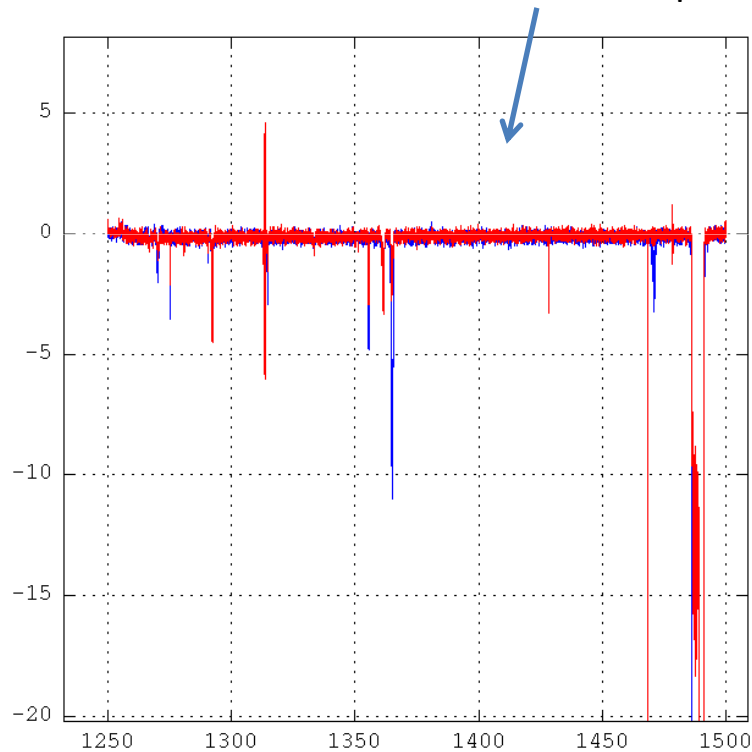
PRELIMINARY RESULTS...

$$r_i = \frac{mean_i - \langle mean_i \rangle}{\sigma_i / \sqrt{N_{paq.per.win}}}$$

i: running over 100 sets of 25000 paq.
(small set just for demonstration)

Error on the mean

If NO RFI: Mean[r_i] = 0 and stdDev[r_i]=1



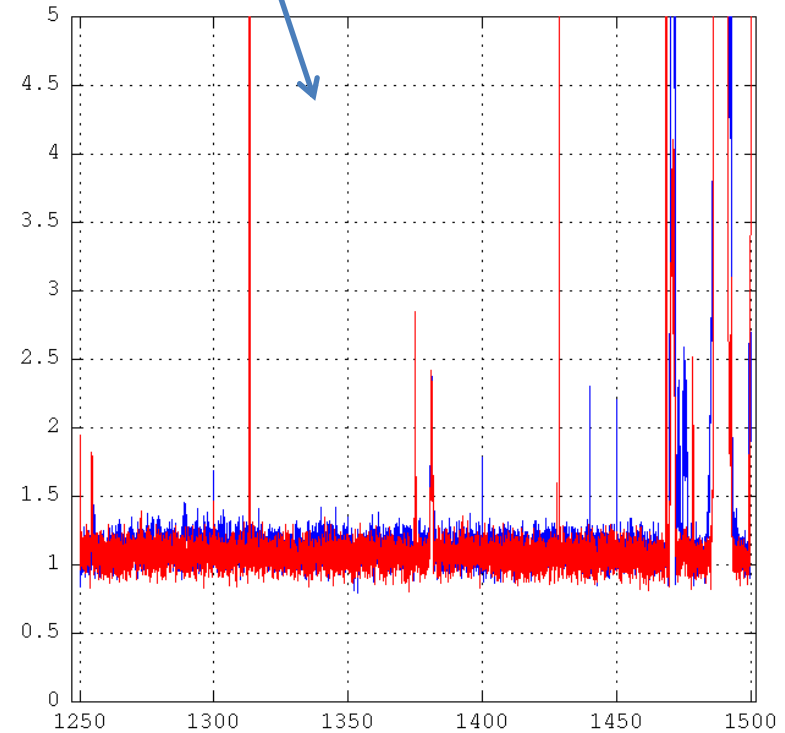
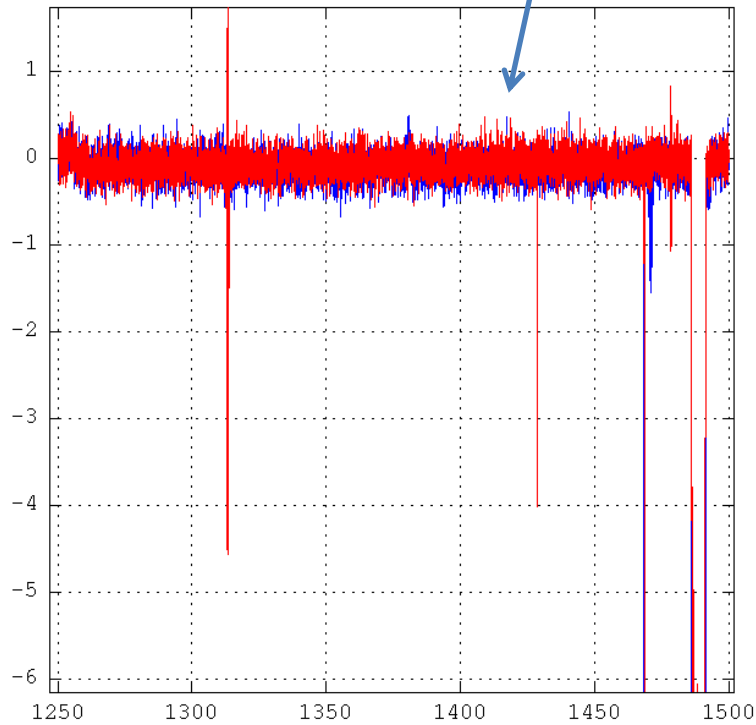
Ch 0 (1) : blue (Red)

$$r_i = \frac{\text{median}_i - \langle \text{median}_i \rangle}{\text{median}_i / (\text{Ln } 2 \times \sqrt{N_{\text{paq.per.win}}})}$$

i: running over 100 sets of 25000 paq.
(same data as previous slide)

Error on the median for an exponential law

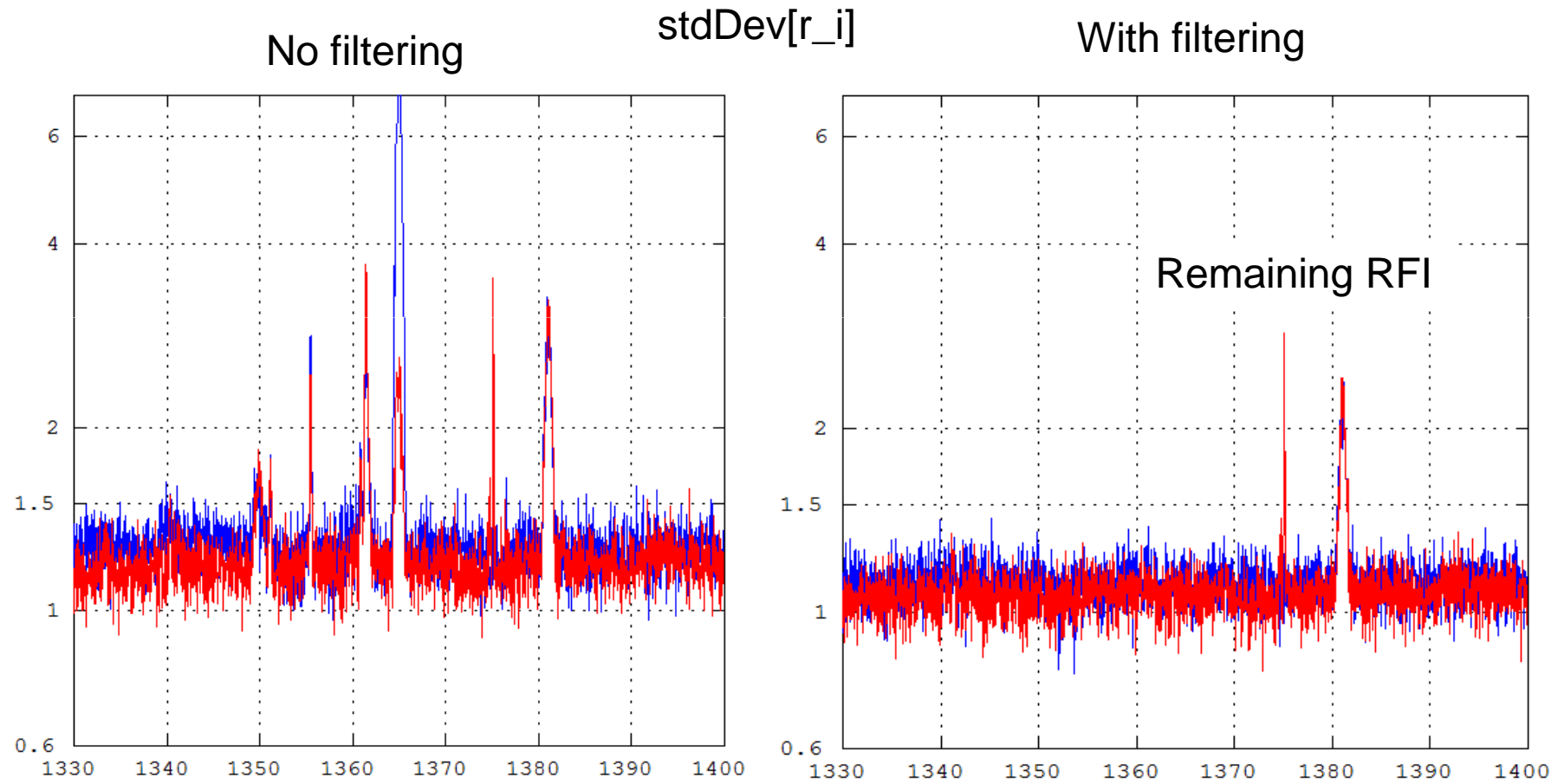
If NO RFI: Mean[r_i] = 0 and stdDev[r_i]=1



Ch 0 (1) : blue (Red)

Mind the Scale

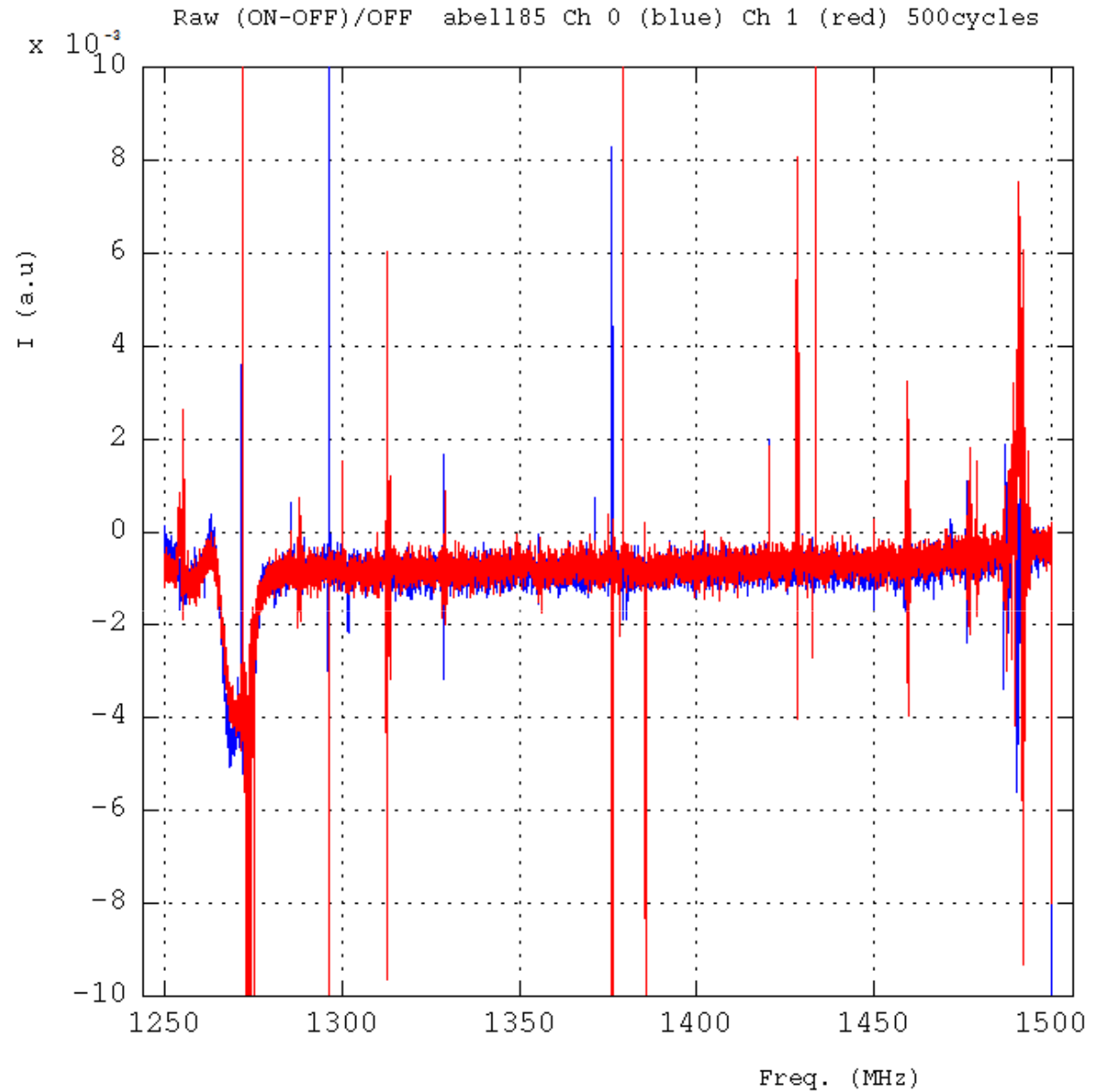
Comparison of the 2 methods



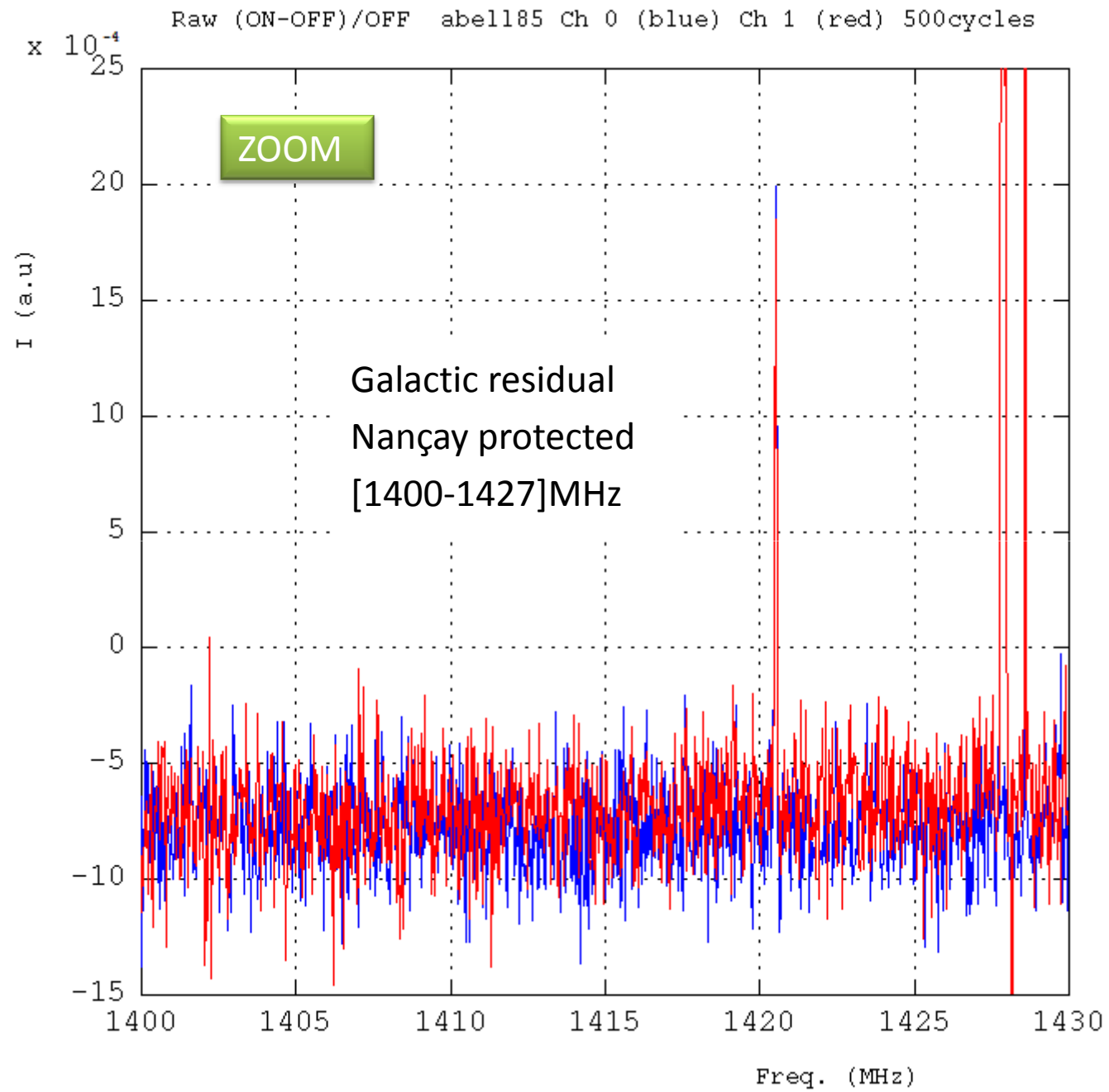
The cleaning seems to work...

500 x 30sec x 1/3
= 5000sec on sky

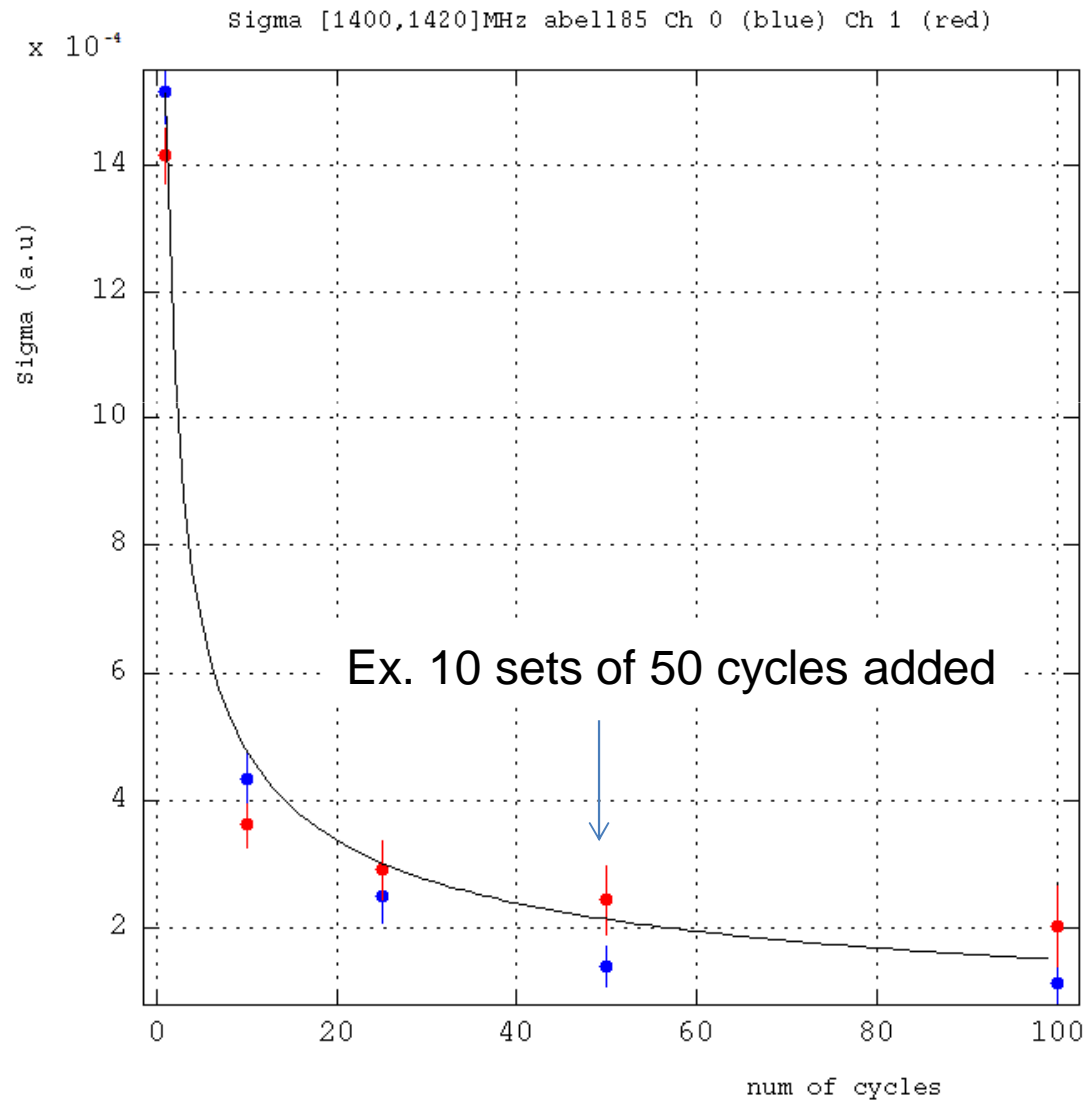
Only median filtering
over the packets
(set of 25600 paq.)



$$\langle \hat{S}(f) \rangle = \frac{1}{N_c^{Tot}} \sum_{r=1}^{N_r} \sum_{c=1}^{N_c(r)} \frac{(ON-OFF)_{r,c}(f)}{\widehat{OFF}_{r,c}(f)}$$



Sigma evolution in the protected freq. Zone [1400-1420]MHz after 500 cycles



Both channels follow the $1/\sqrt{\text{time}}$ law.

BACK-UP

