

# XMM-Newton CCF Release Note

XMM-CCF-REL-140

## RGS Gains and CTI Parameters refinement

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### 1 CCF components

Name of CCF	VALDATE	EVALDATE	List of Blocks changed	XSCS flag
RGS2_ADUCONV_0021	2002-11-13T23:00:00	—	OFFSET_GAIN	NO
RGS1_CTL0005	2002-11-13T23:00:00	—	XCTI, CTIY1, CTIY2, CTIY3, CTIY4, CTIY5, CTIY6, CTIY7, CTIY8, CTIY9	NO
RGS2_CTL0006	2002-11-13T23:00:00	—	XCTI, CTIY1, CTIY2, CTIY3, CTIY4, CTIY5, CTIY6, CTIY7, CTIY8, CTIY9	NO

### 2 Changes

In November 2002 the operational temperature of the RGS CCDs was decreased from -80 C to finally -110 C degrees, with corresponding changes in CCDs' offsets and gains.

The previous release note (XMM-CCF-REL-132) addressed all the changes needed after the CCD cooling. A third set of calibration observations was performed 10 days after the cooling, in order to check the stability of the data. The stability was confirmed to a large extent, the additional use of these data led to slightly different CTI and GAIN values as derived previously. The effect on the general calibration is minimal (around 1% on effective area maximally).



### 3 Scientific Impact of this Update

These files are essential for the calibration of the RGSs after cooling. They replace the former derived ones, representing a slight update with respect to those.

### 4 Estimated Scientific Quality

A full assessment of the scientific quality of data post-cooling and a comparison to previous figures have still to be made. A general estimation is however, that the calibration accuracy is at least as good as it was before. The much reduced noise levels after cooling allow us to derive very reliable calibration figures already with few observations.

### 5 Expected Updates

The evolution of CTI, gains and offsets will continue to be monitored. The general degradation with radiation will lead to an update in the frametime of 1-2 years.

### 6 Test procedures

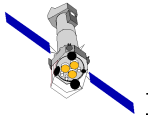
General checks:

- use fv (or another fits viewer) for file inspection. The ADU CONV CCFs should contain 2 binary extensions (ADUCOEFF and OFFSET\_GAIN), the CTI CCFs should contain 12 binary extensions (CTI, CTI extended, CTIx and the nine CTIY[1-9]).
- use the SAS task cifbuild to check that the CAL selects correctly the new files.
- process datasets covered by the new files and check the energy plot.

### 7 Summary of the test results

The fits viewer fv was used to inspect all 3 CCF files, wrt their structure, validity dates and contents of the changed extensions. Everything OK.

The SAS task cifbuild was run using data corresponding to revolution 537. The files were correctly taken.



In addition a Markarian 421 observation performed in revolution 546 was processed with rgsproc and the results checked. Figs. 1 and 2 show the high quality of spatial and energy selection regions with both cameras.

## References

RGS Gains, offsets and CTI Parameters after cooling down CCDs in November 2002, XMM-CCF-REL-132, C. Gabriel, A. Pollock A. and C. de Vries, V1.1, Dec. 2002

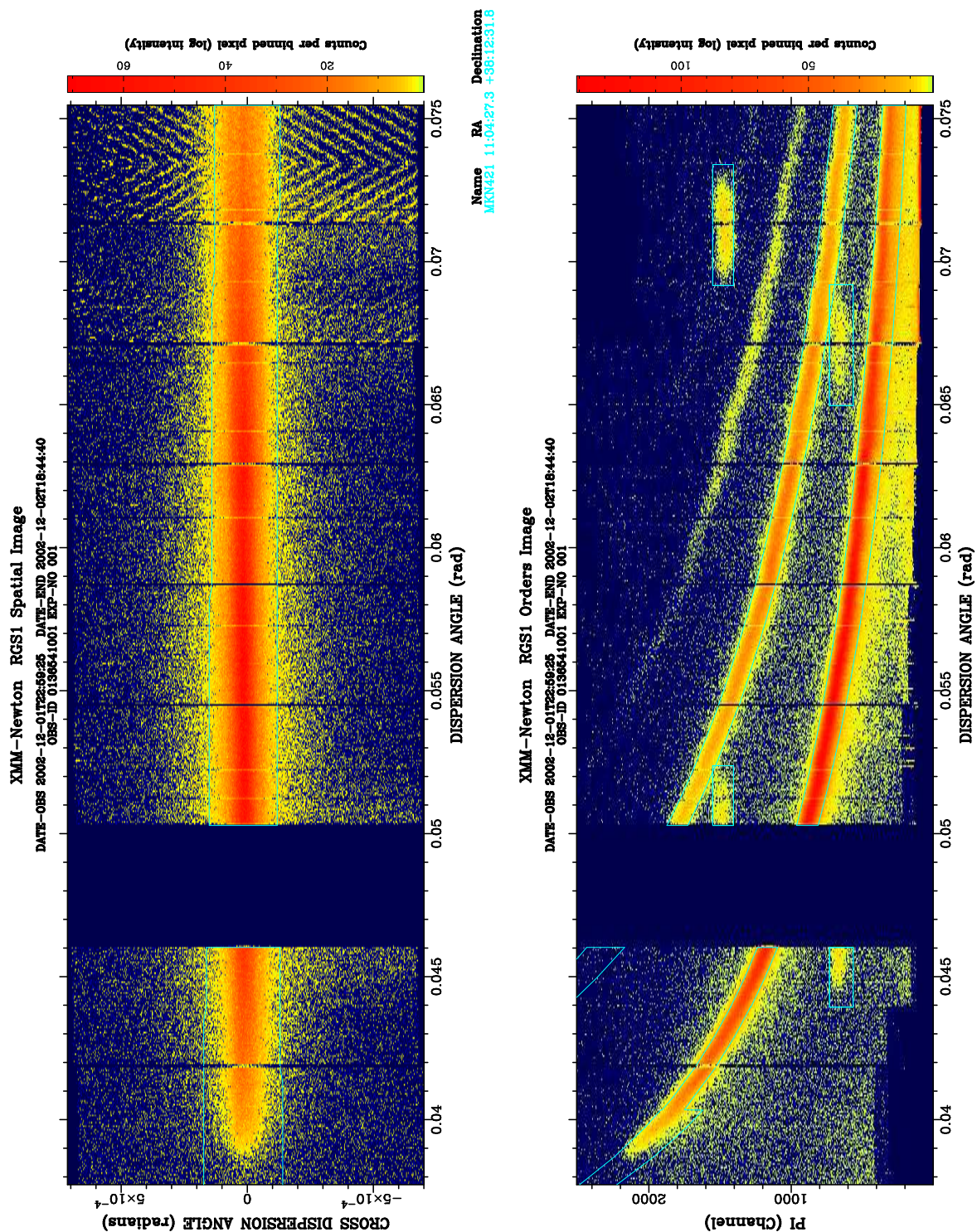
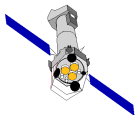


Figure 1: Selection regions in RGS1 Mkn421 observation in rev. 546

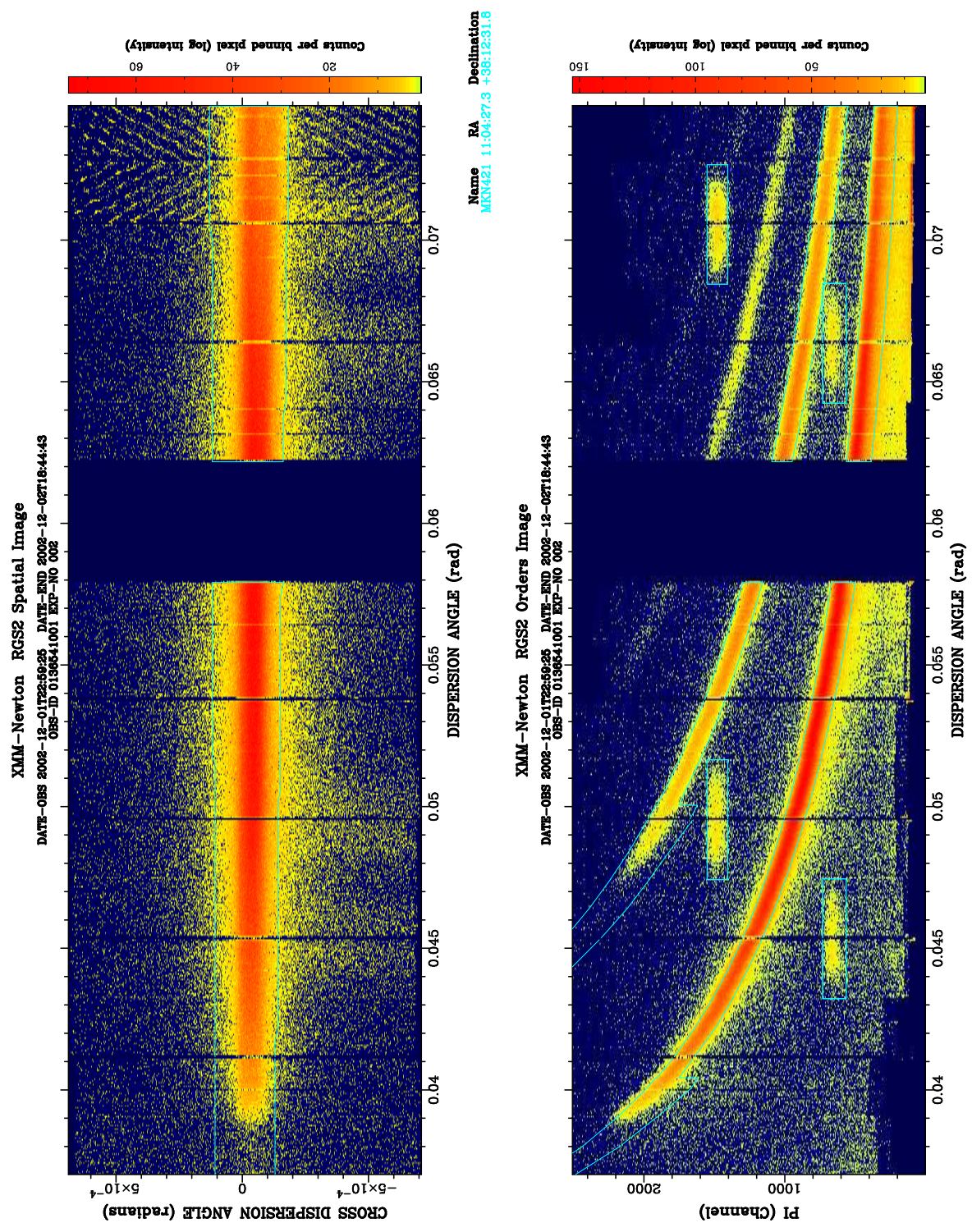
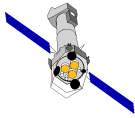


Figure 2: Selection regions in RGS2 Mkn421 observation in rev. 546