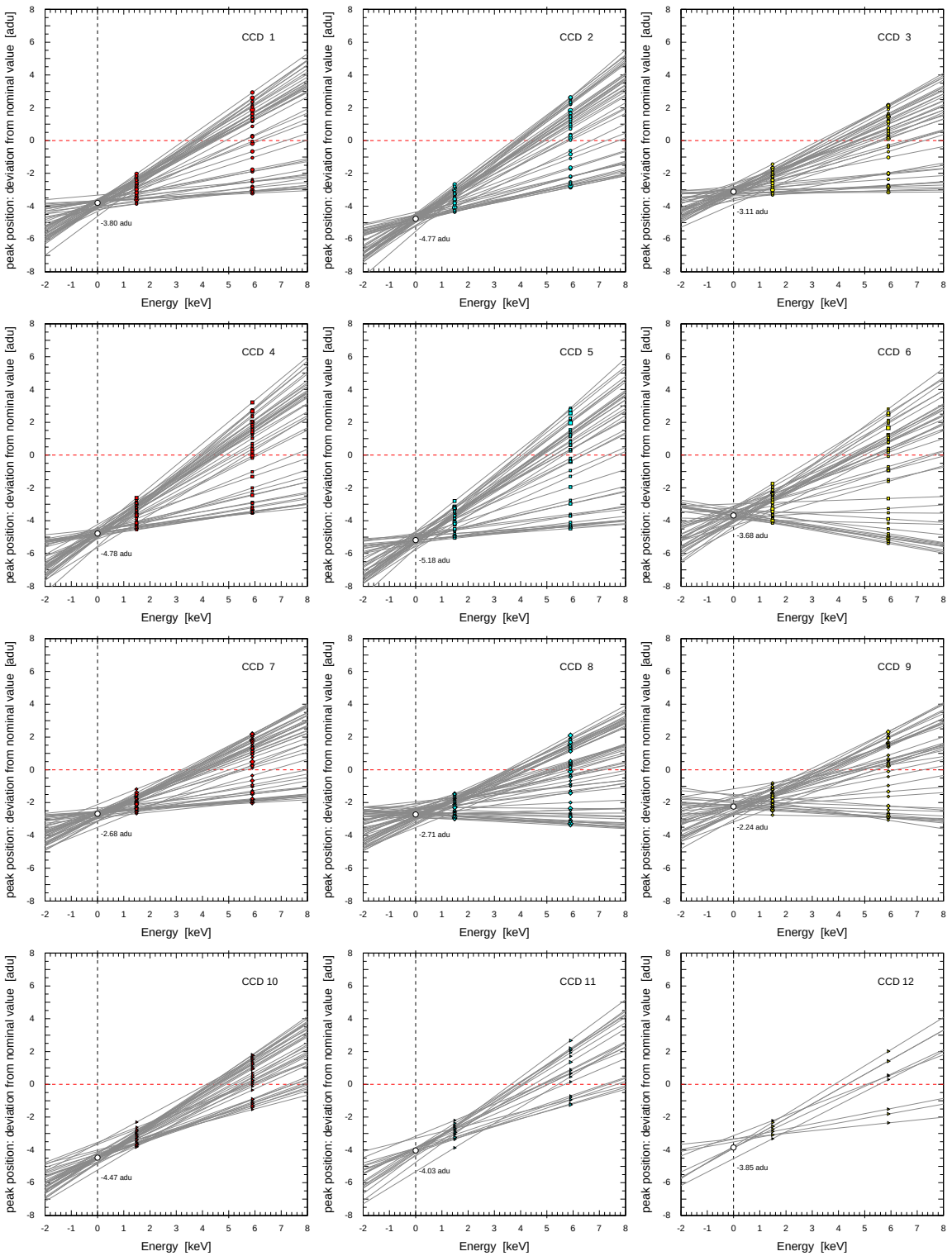
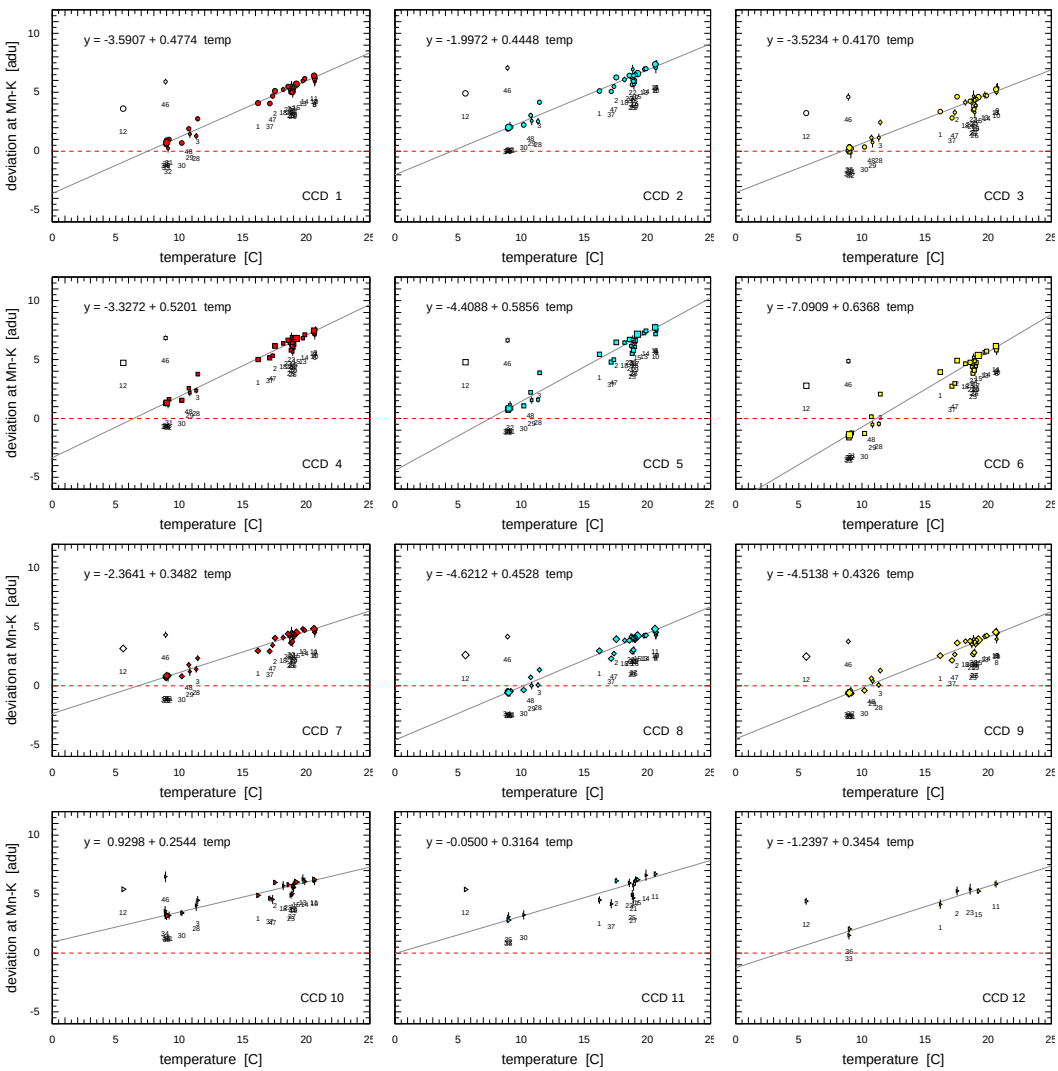
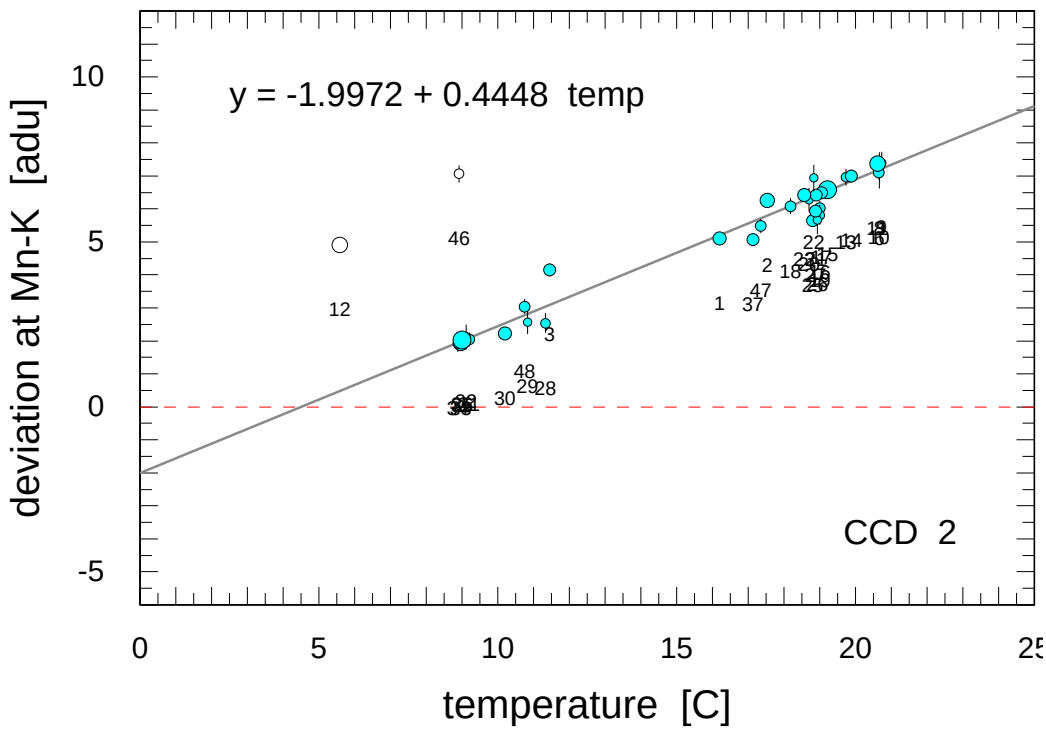
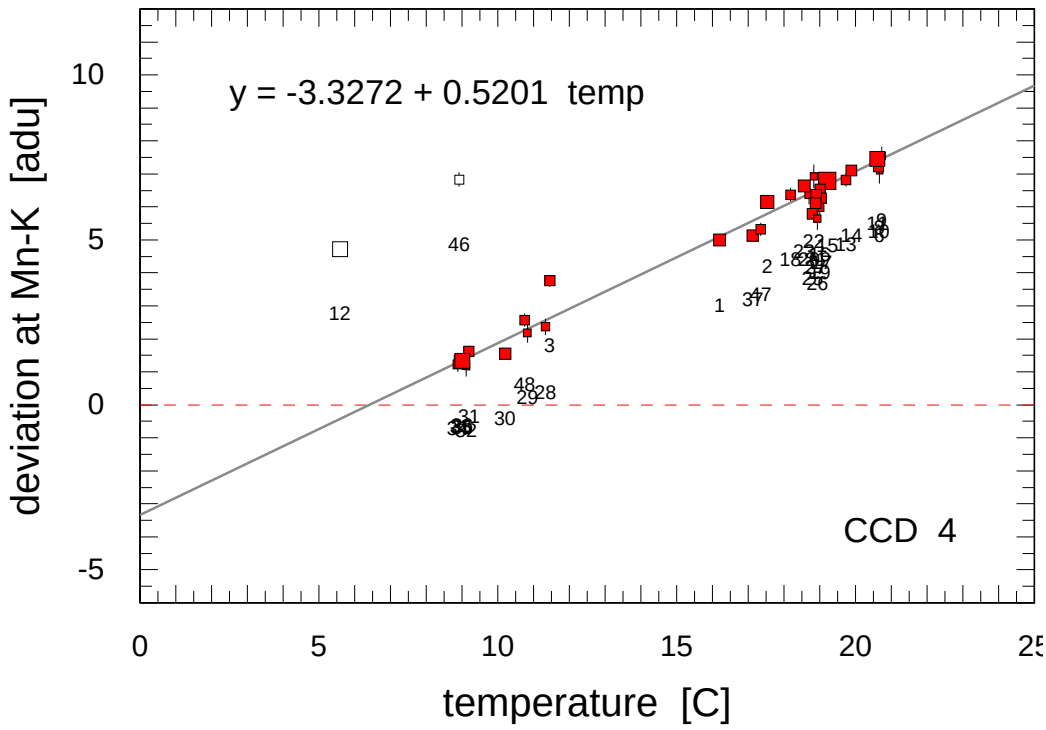
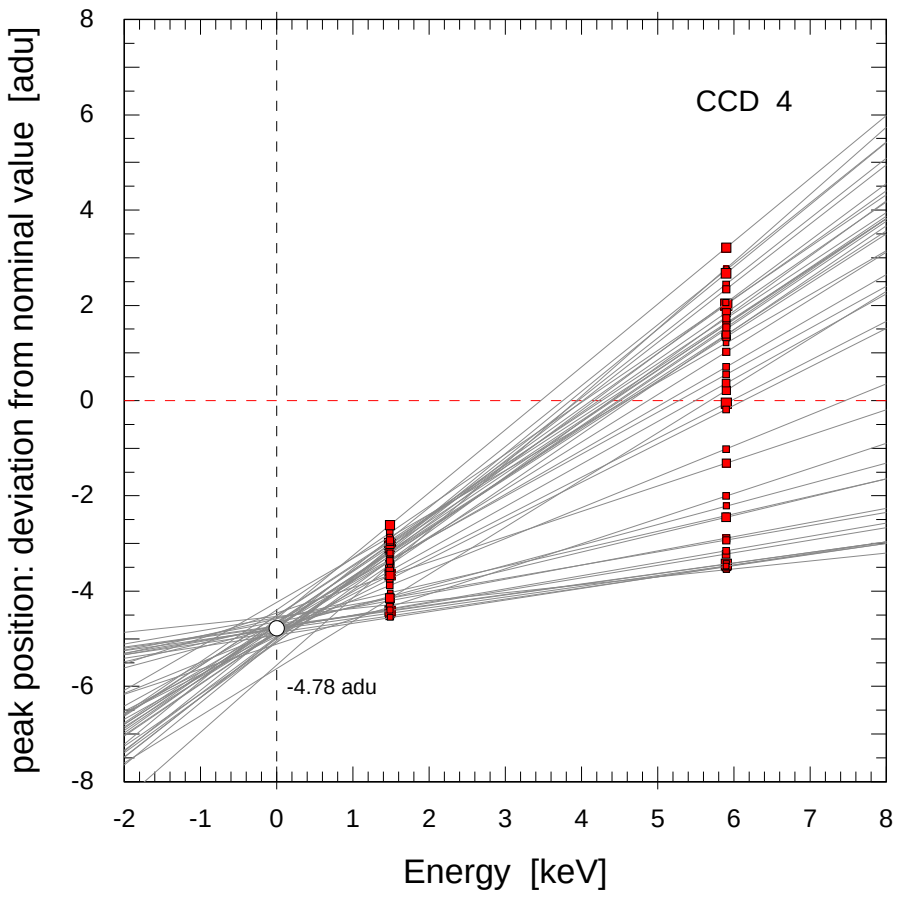


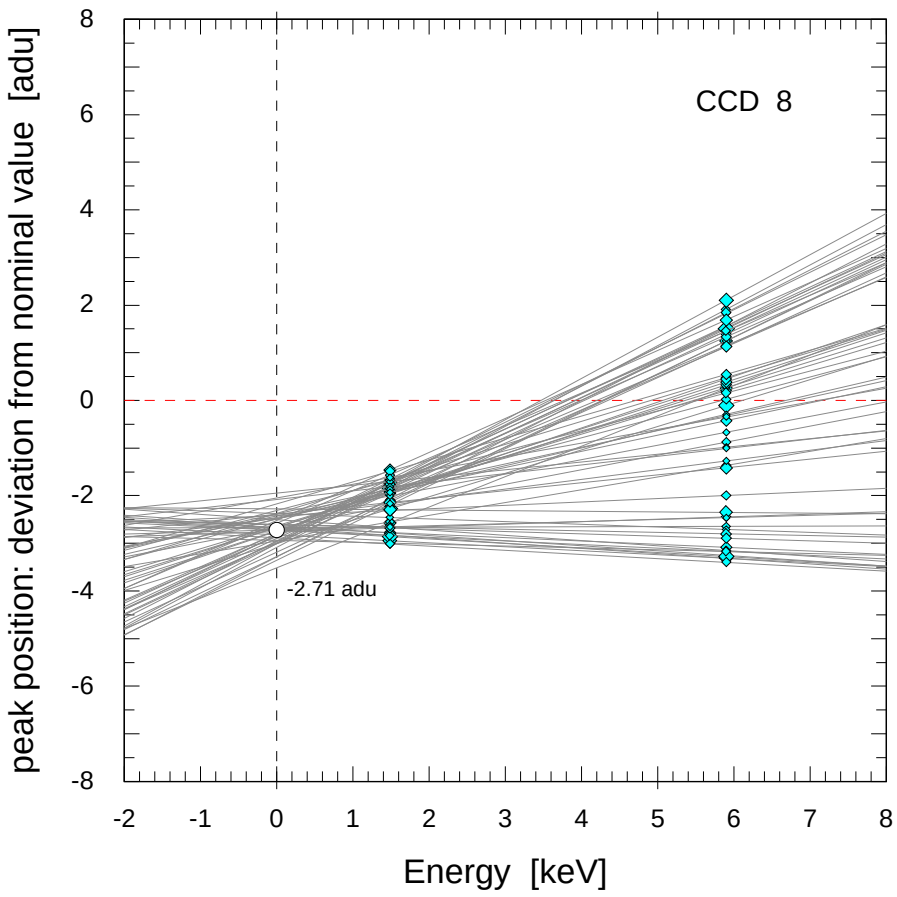
Deviation of the Al-K and Mn-K$_\alpha$ peak positions from the nominal value, after correcting for a mean CTI change of $+0.59 \cdot 10^{-7}/d$. The peak positions were determined from calibration observations in FF mode from rev. 023 – 202, and corrected with the initial CTE and gain model. Only observations were selected where the combined 1σ uncertainty in both peak positions was less than 0.5 adu; the area of the symbols is inversely proportional to the 1σ uncertainty. The scatter of the data points is mainly caused by temperature changes in the electronic box. Straight lines were drawn through the peak positions belonging to the same measurement. For each CCD, these lines tend to intersect each other at $E = 0$ keV. The open circle is the median value of the offset at this position; its value is printed below the circle.


y = -3.5907 + 0.4774 temp
CCD 1
y = -1.9972 + 0.4448 temp
CCD 2
y = -3.5234 + 0.4170 temp
CCD 3
y = -3.3272 + 0.5201 temp
CCD 4
y = -4.4088 + 0.5856 temp
CCD 5
y = -7.0909 + 0.6368 temp
CCD 6
y = -2.3641 + 0.3482 temp
CCD 7
y = -4.6212 + 0.4528 temp
CCD 8
y = -4.5138 + 0.4326 temp
CCD 9
y = 0.9298 + 0.2544 temp
CCD 10
y = -0.0500 + 0.3164 temp
CCD 11
y = -1.2397 + 0.3454 temp
CCD 12
deviation at Mn-K [adu]
temperature [C]


y = -1.9972 + 0.4448 temp
CCD 2
deviation at Mn-K [adu]
temperature [C]
10
5
0
-5
0
5
10
15
20

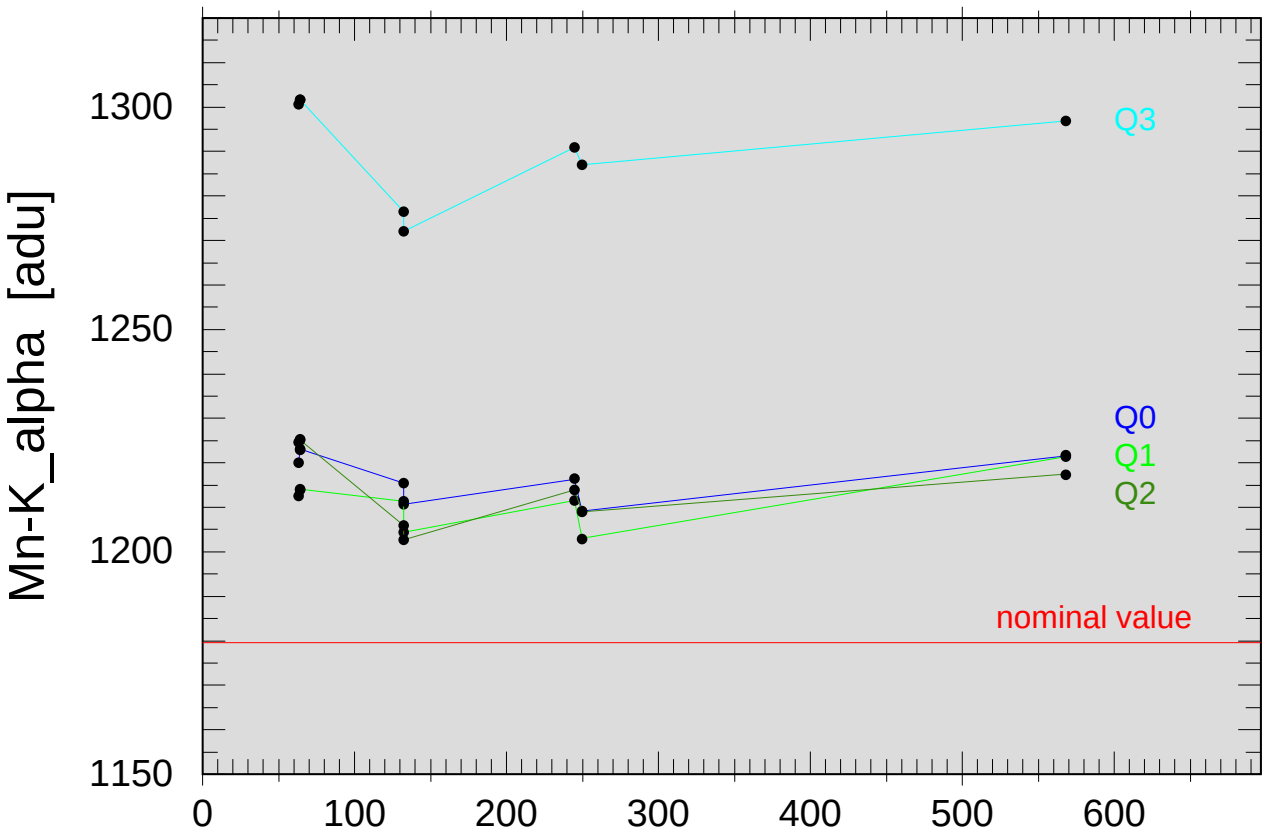

y = -3.3272 + 0.5201 temp
CCD 4
deviation at Mn-K [adu]
temperature [C]
10
5
0
-5
0
5
10
15
20

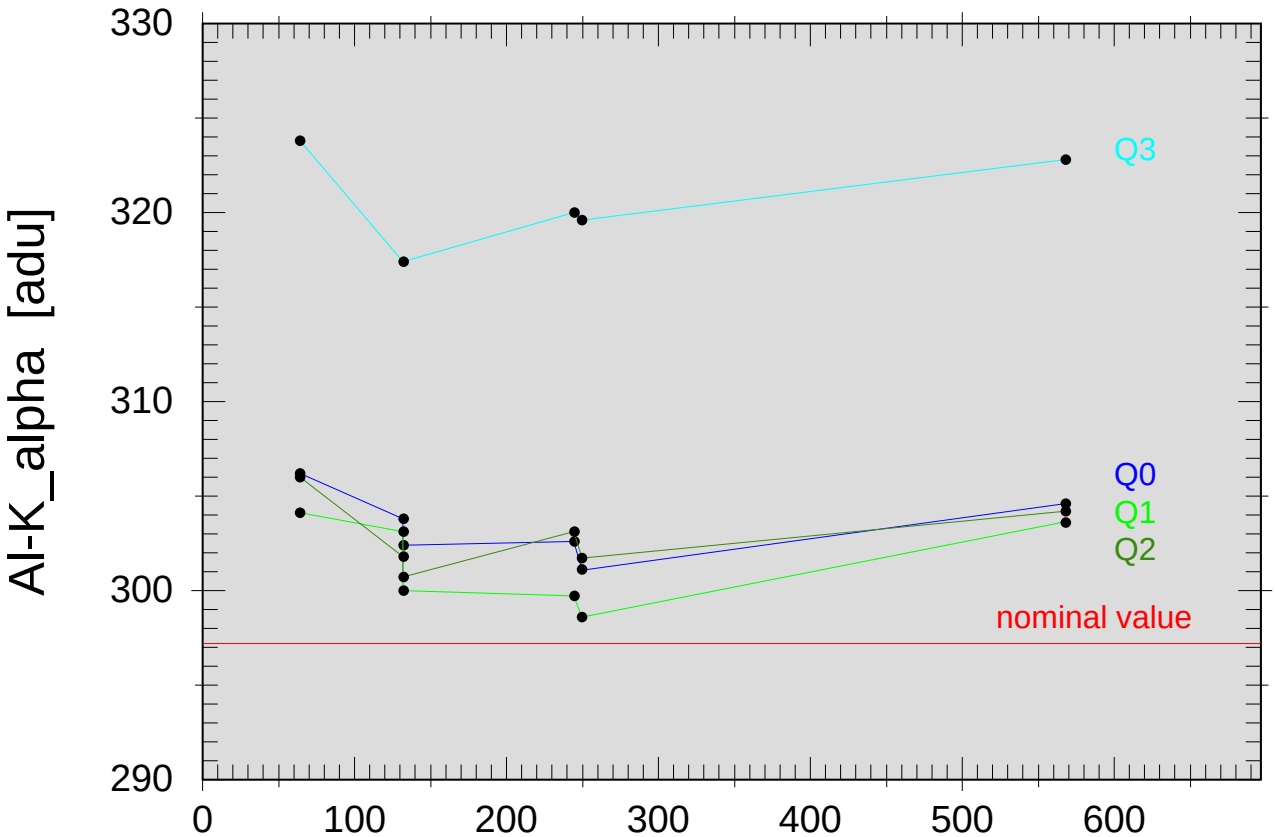

CCD 4
peak position: deviation from nominal value [adu]
Energy [keV]
-4.78 adu
8
6
4
2
0
-2
-4
-6
-8
-2
-1
0
1
2
3
4
5
6
7
8

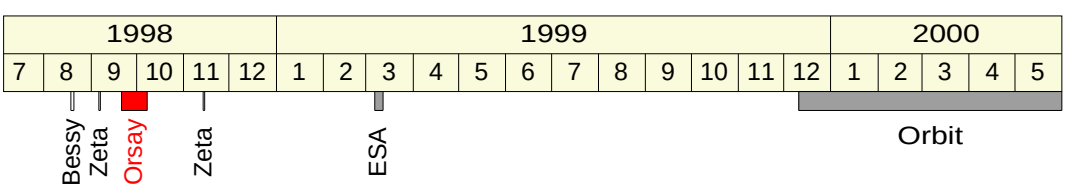

CCD 8
peak position: deviation from nominal value [adu]
Energy [keV]
-2.71 adu
8
6
4
2
0
-2
-4
-6
-8
-2
-1
0
1
2
3
4
5
6
7
8

XMM / EPIC pn temporal behaviour of peak positions

corrected with CTE and gain model of 17-Feb-2000 derived from Orsay cal.

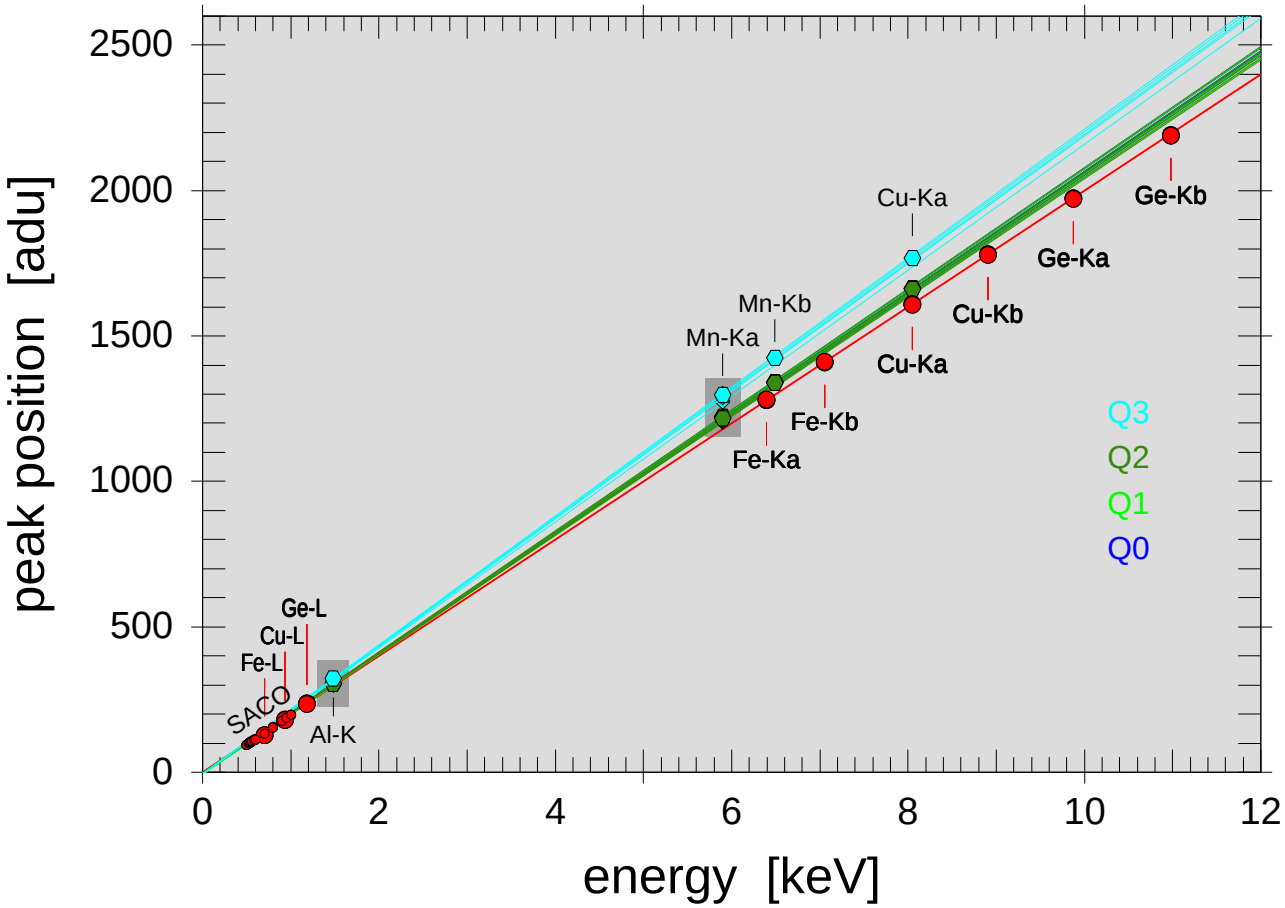


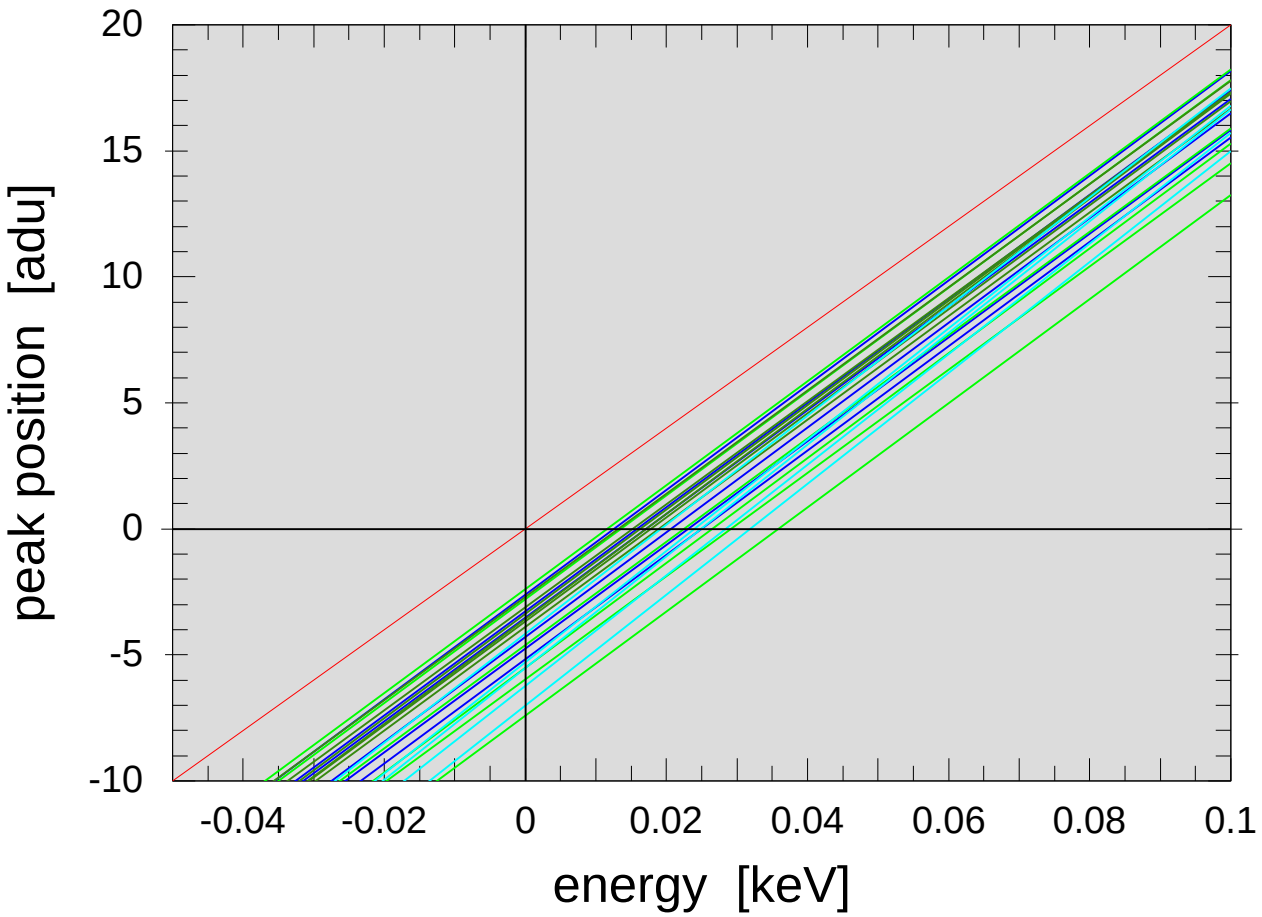




XMM / EPIC pn channel / energy conversion

data corr. with CTE and gain model of 17-Feb-2000 derived from Orsay cal

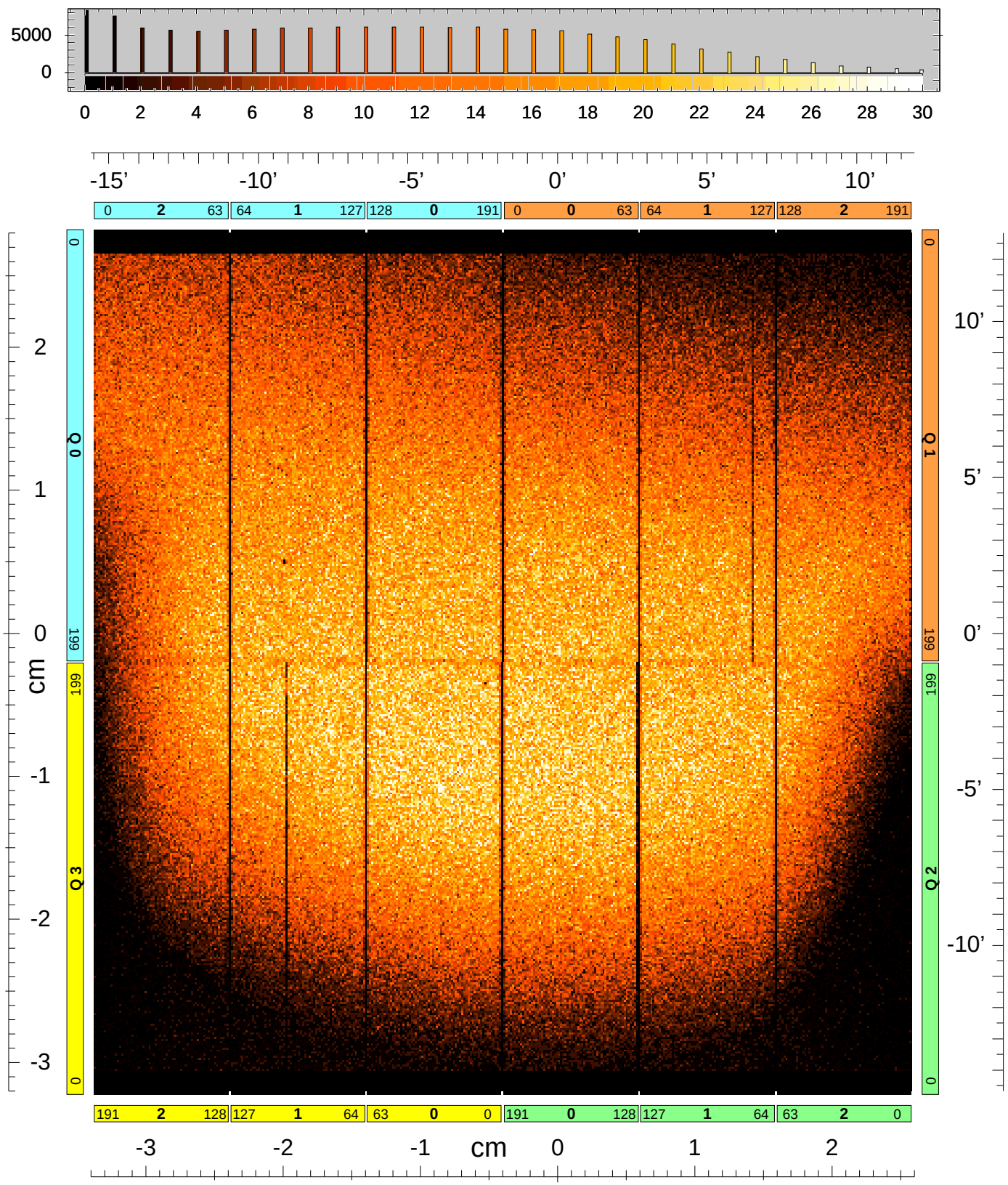




XMM / EPIC pn

pn080001_003_*_map.fits

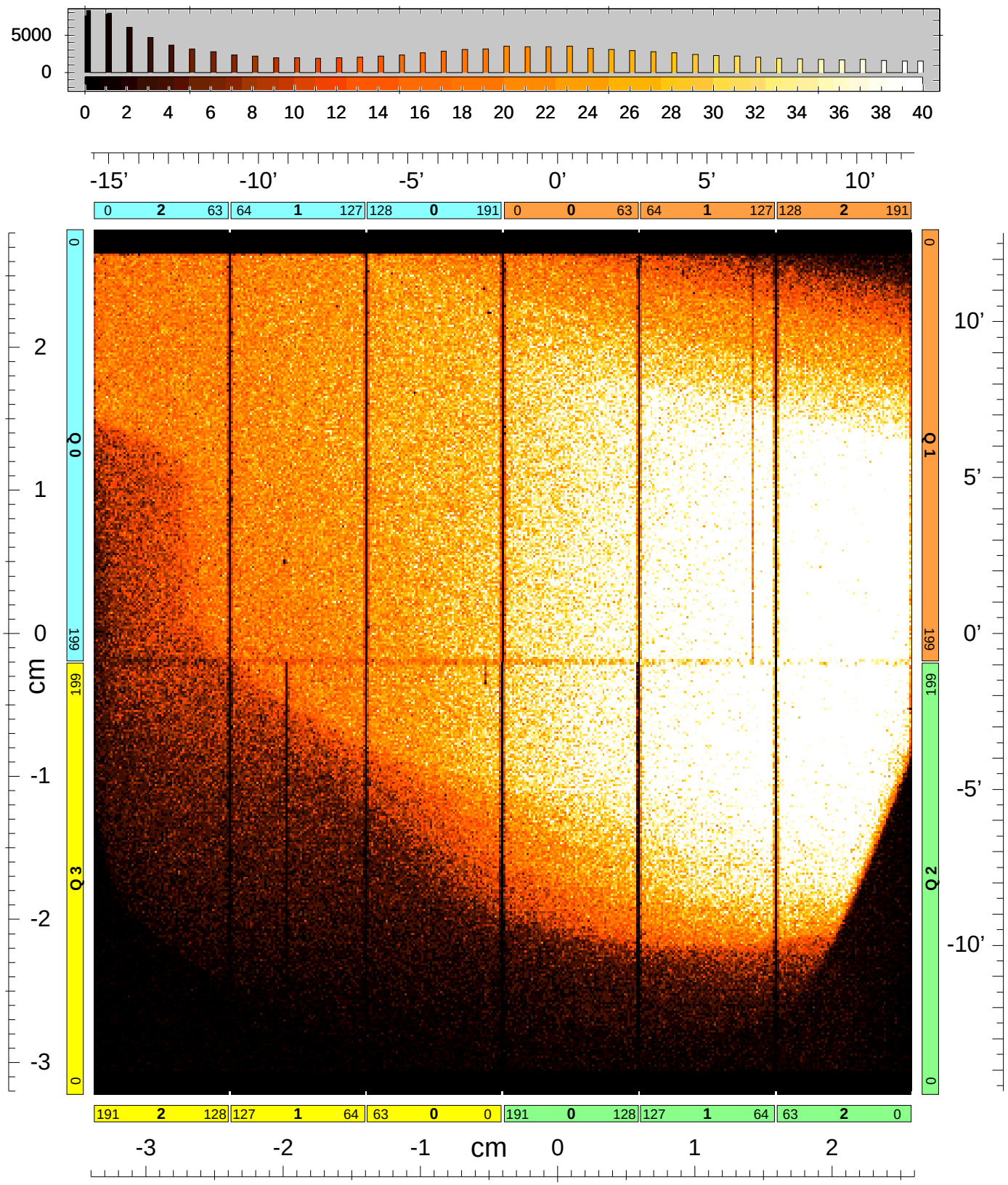
ph 250-340c



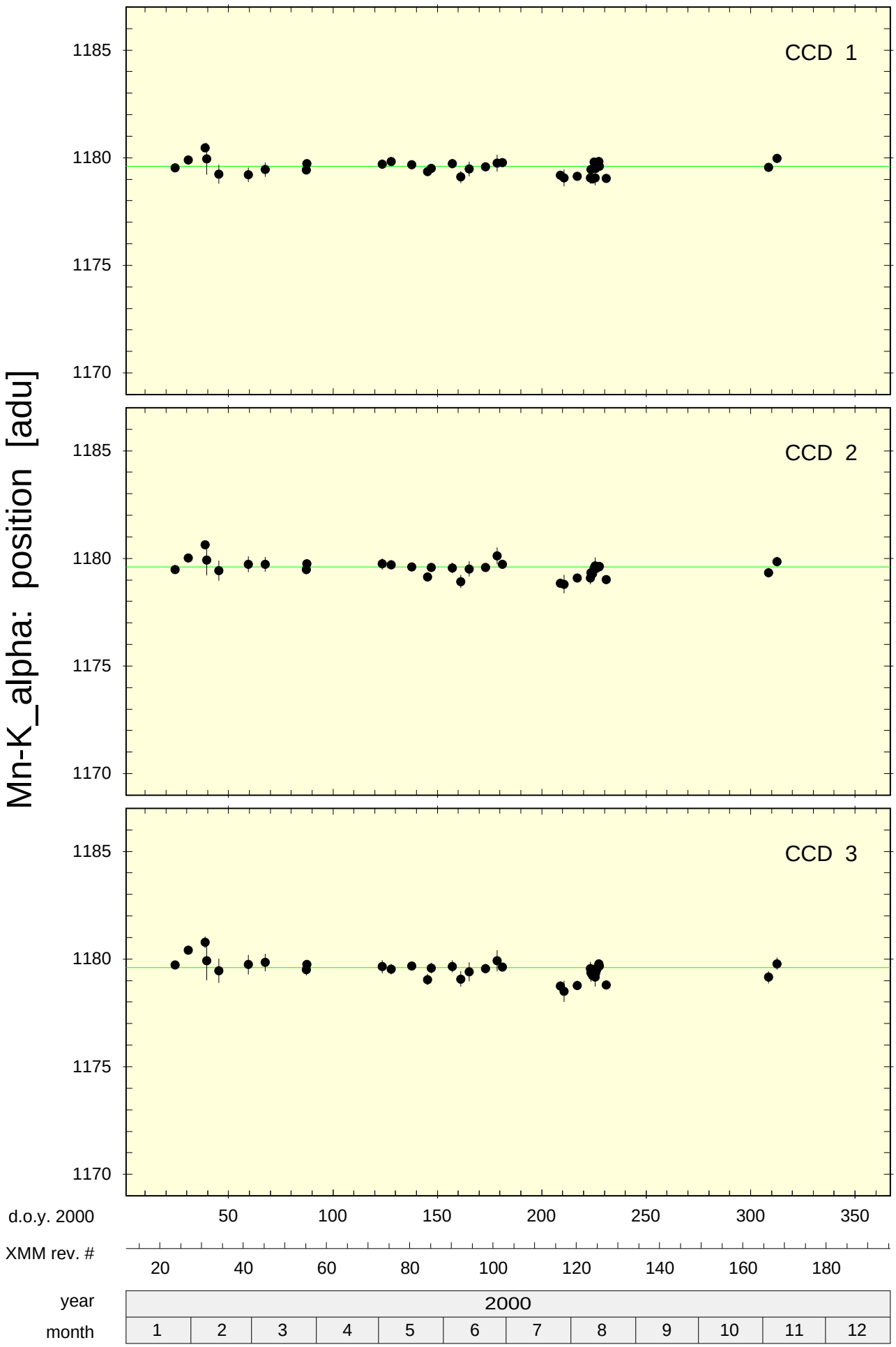
XMM / EPIC pn

pn080001_003_*_map.fits

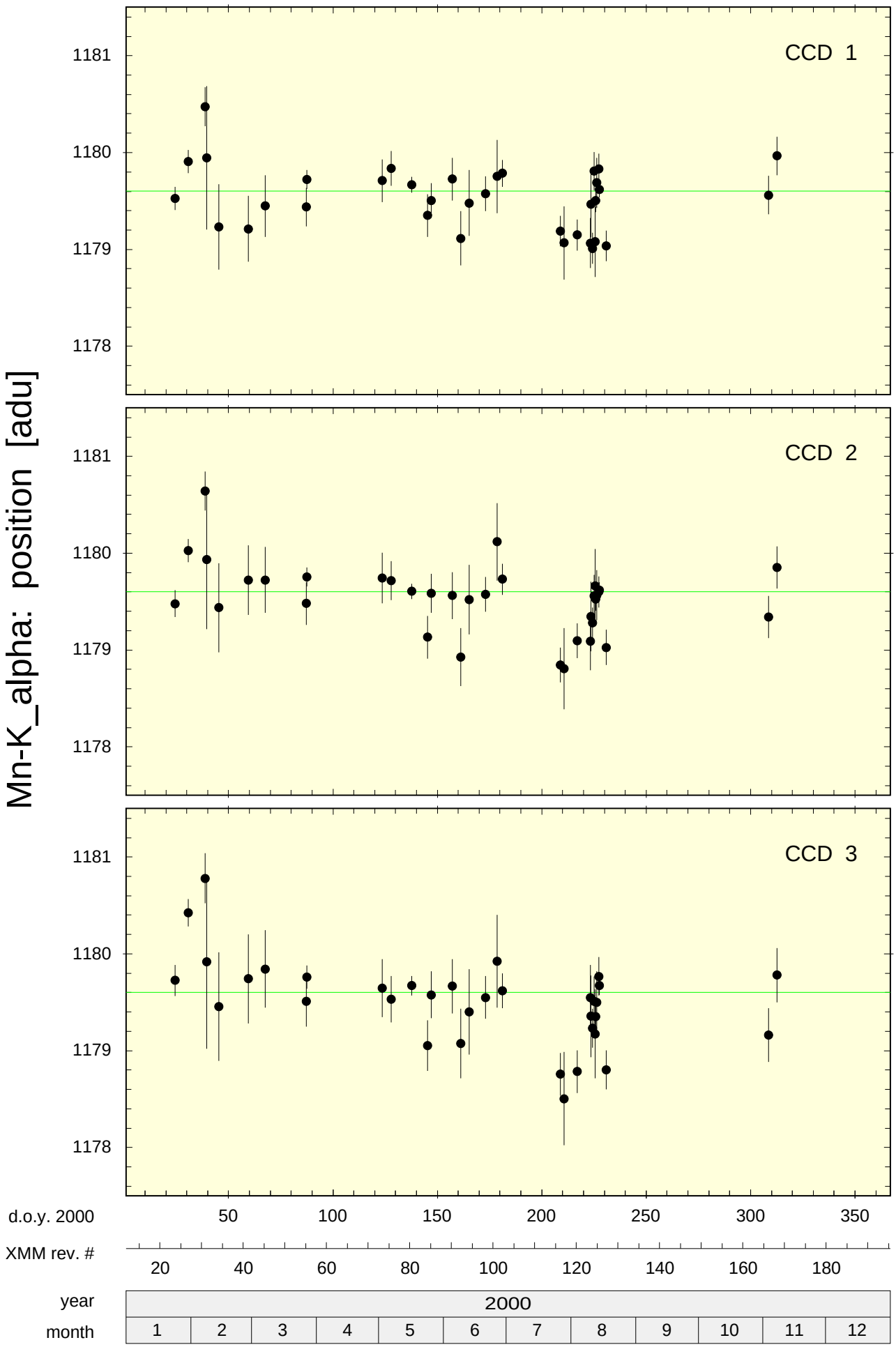
ph 1120-1230c



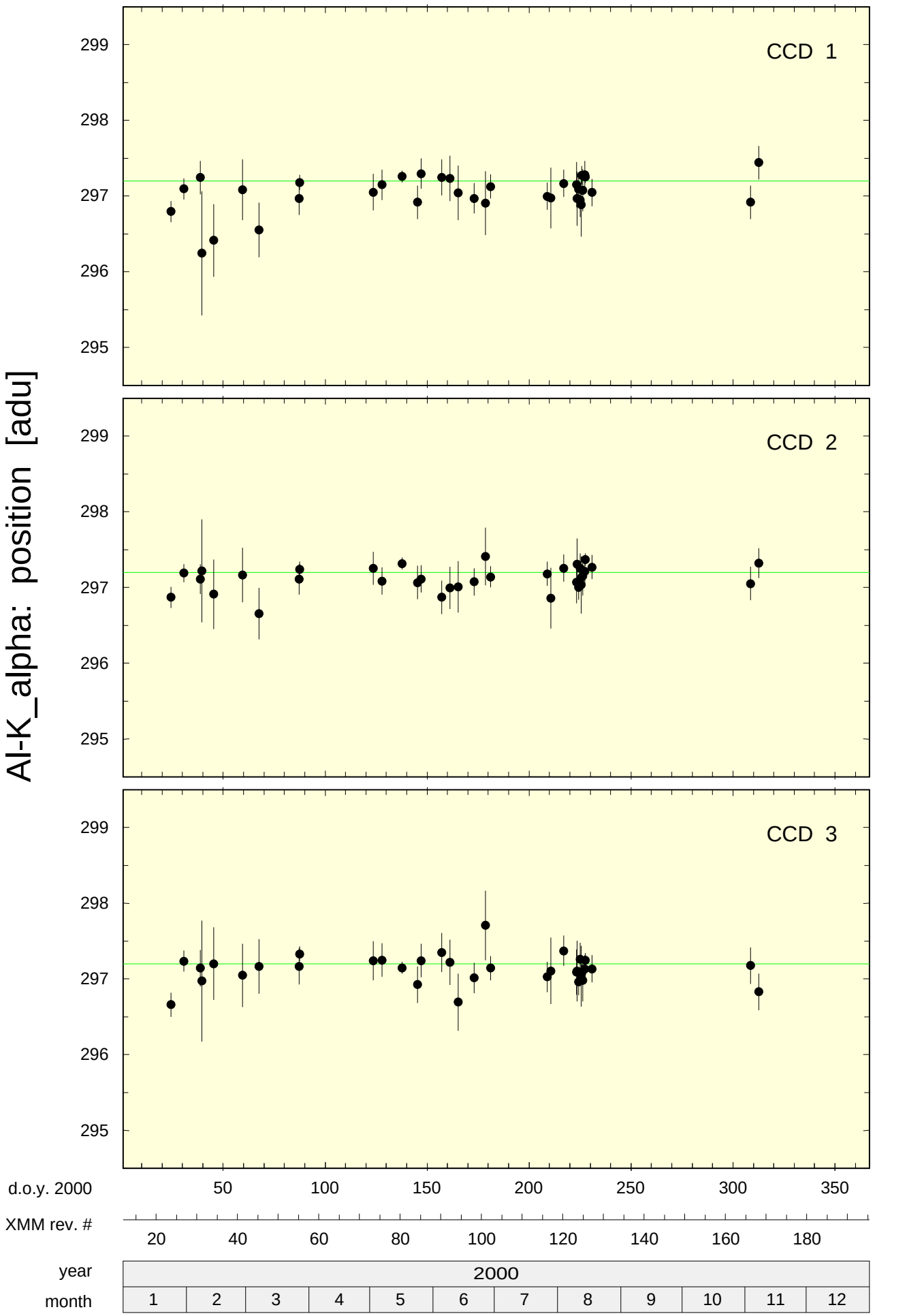
XMM - Newton / EPIC pn internal calibration source



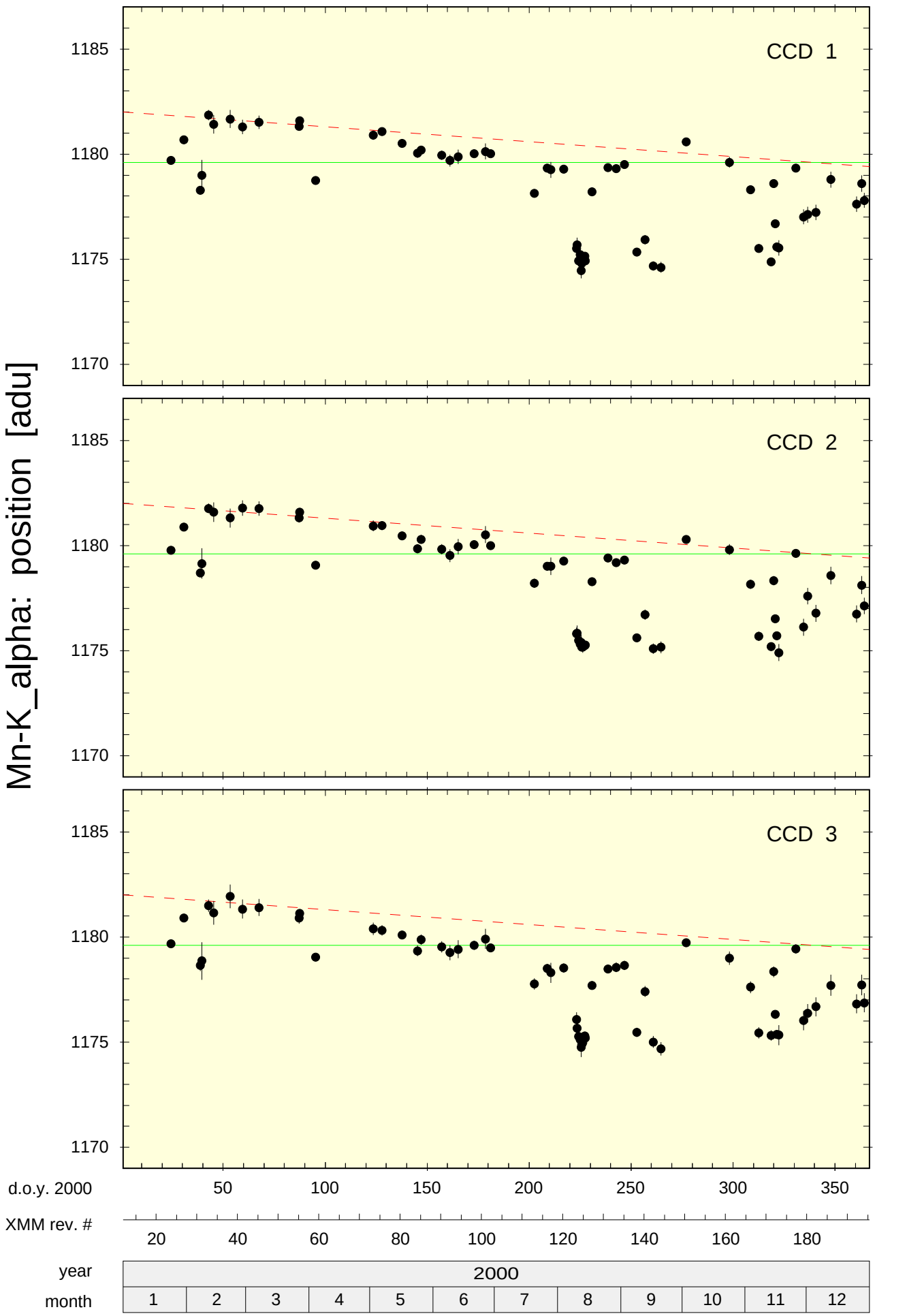
XMM - Newton / EPIC pn internal calibration source

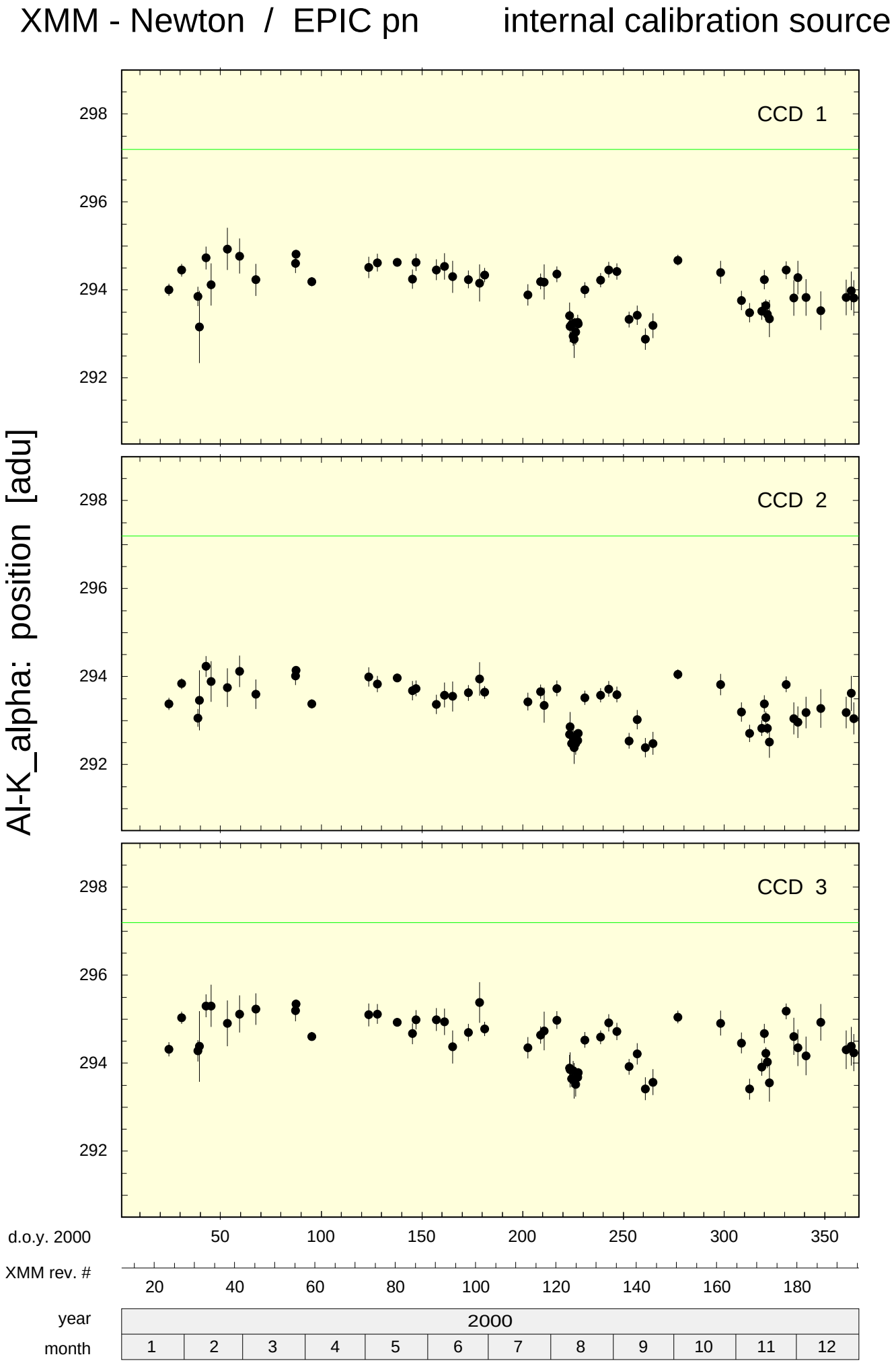


XMM - Newton / EPIC pn internal calibration source

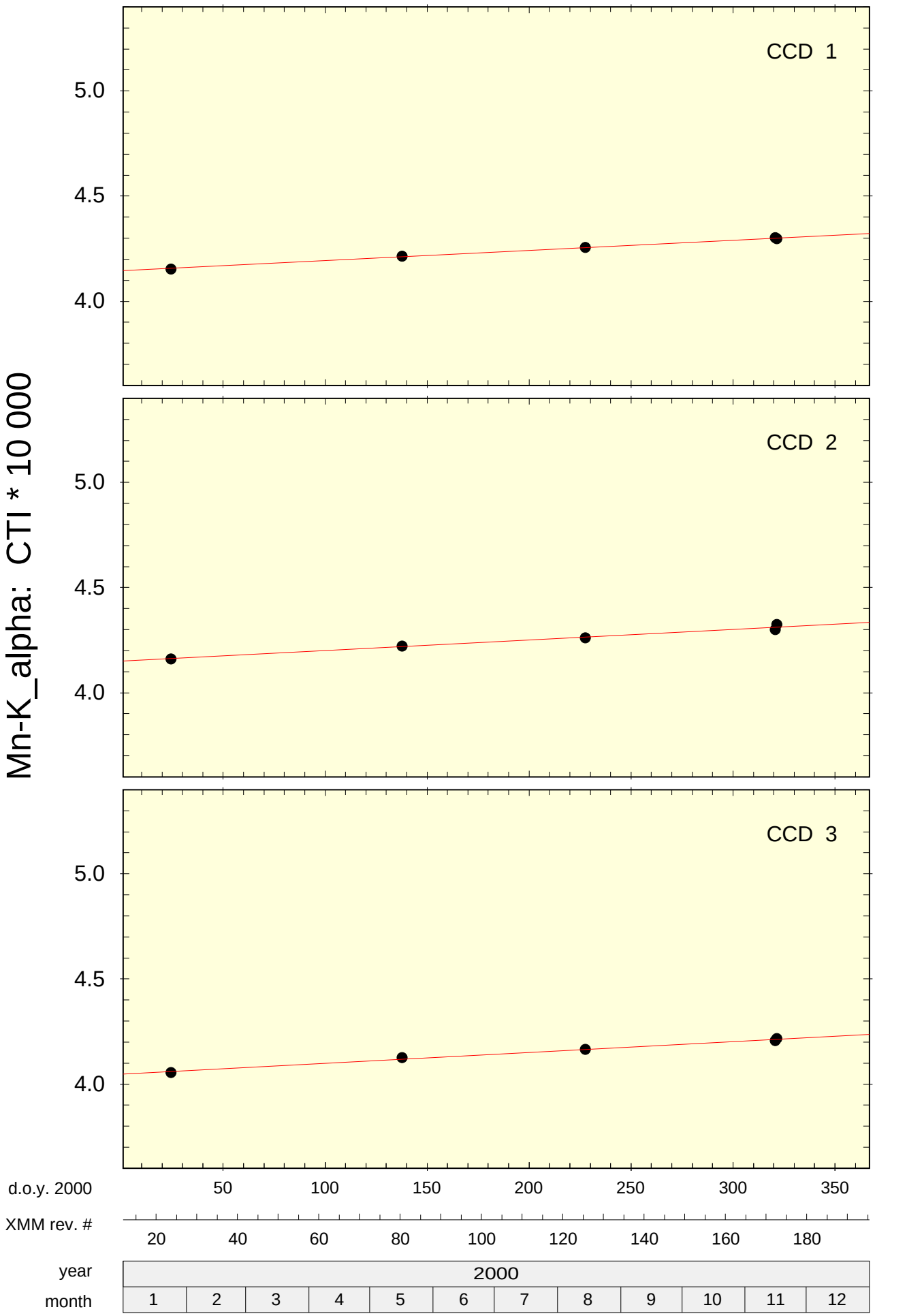


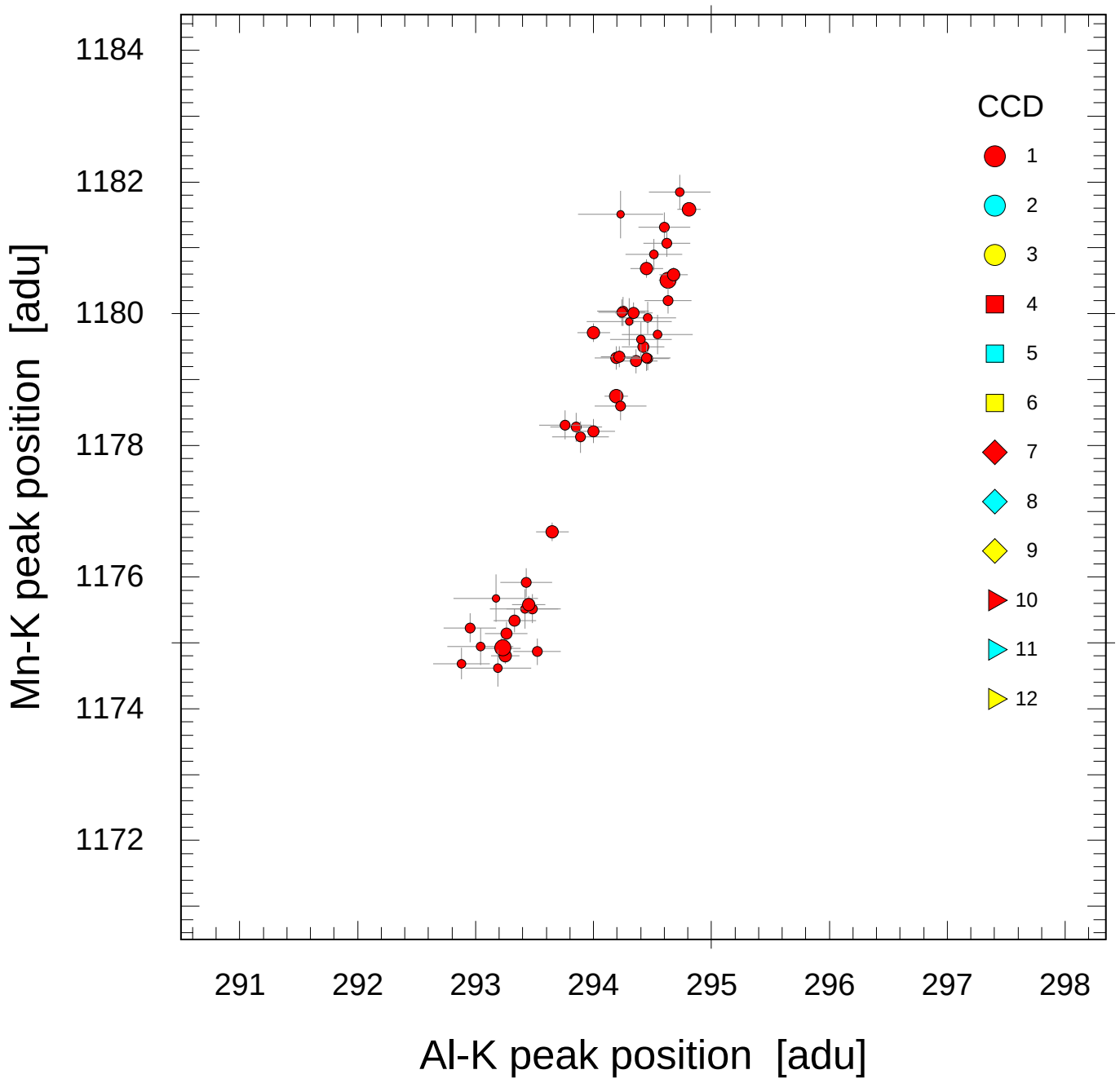
XMM - Newton / EPIC pn internal calibration source

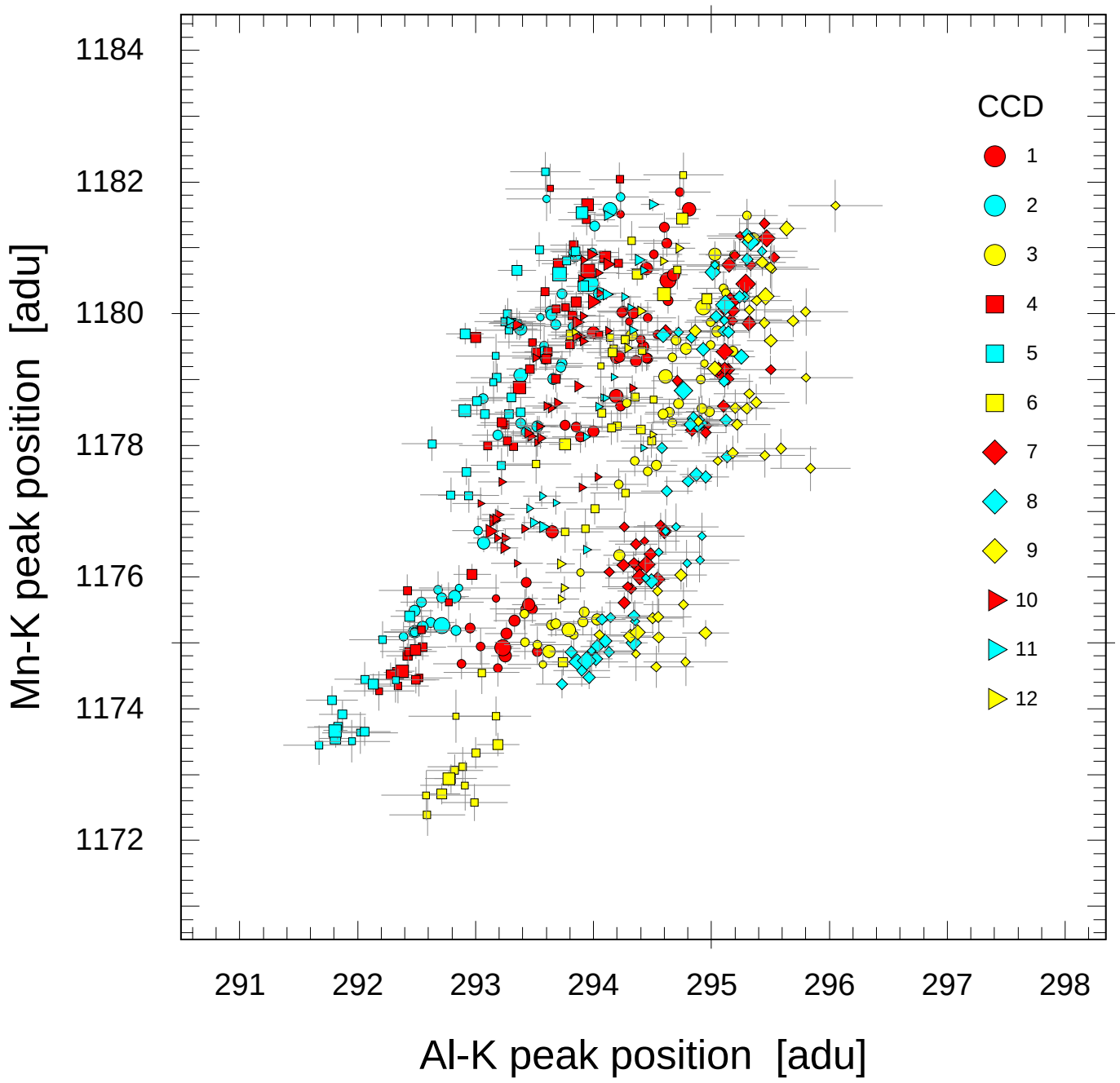


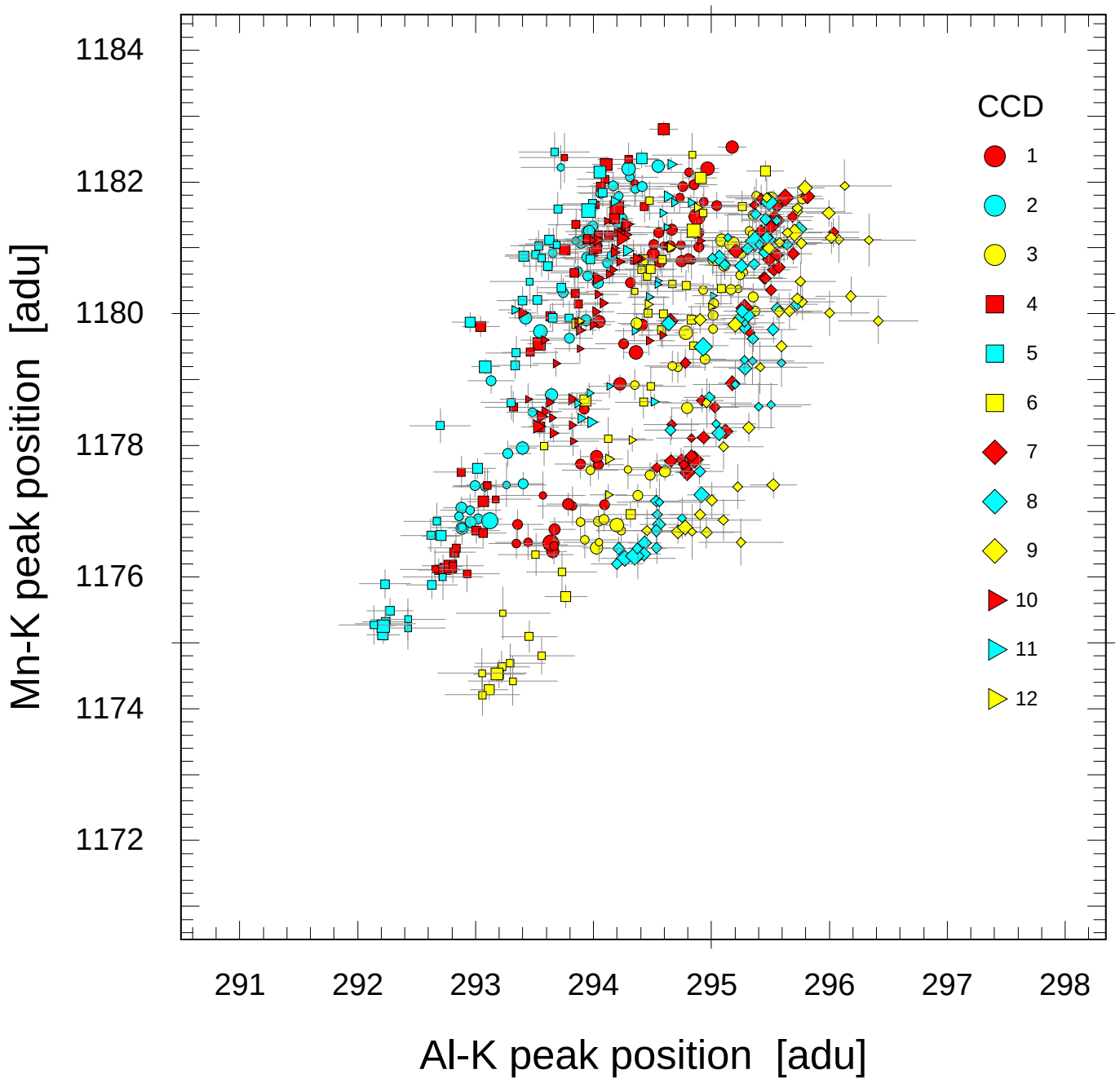

XMM - Newton / EPIC pn internal calibration source
Al-K_alpha: position [adu]
CCD 1
CCD 2
CCD 3
298
296
294
292
d.o.y. 2000
50
100
150
200
250
300
350
XMM rev. #
20
40
60
80
100
120
140
160
180
year
2000
month
1
2
3
4
5
6
7
8
9
10
11
12

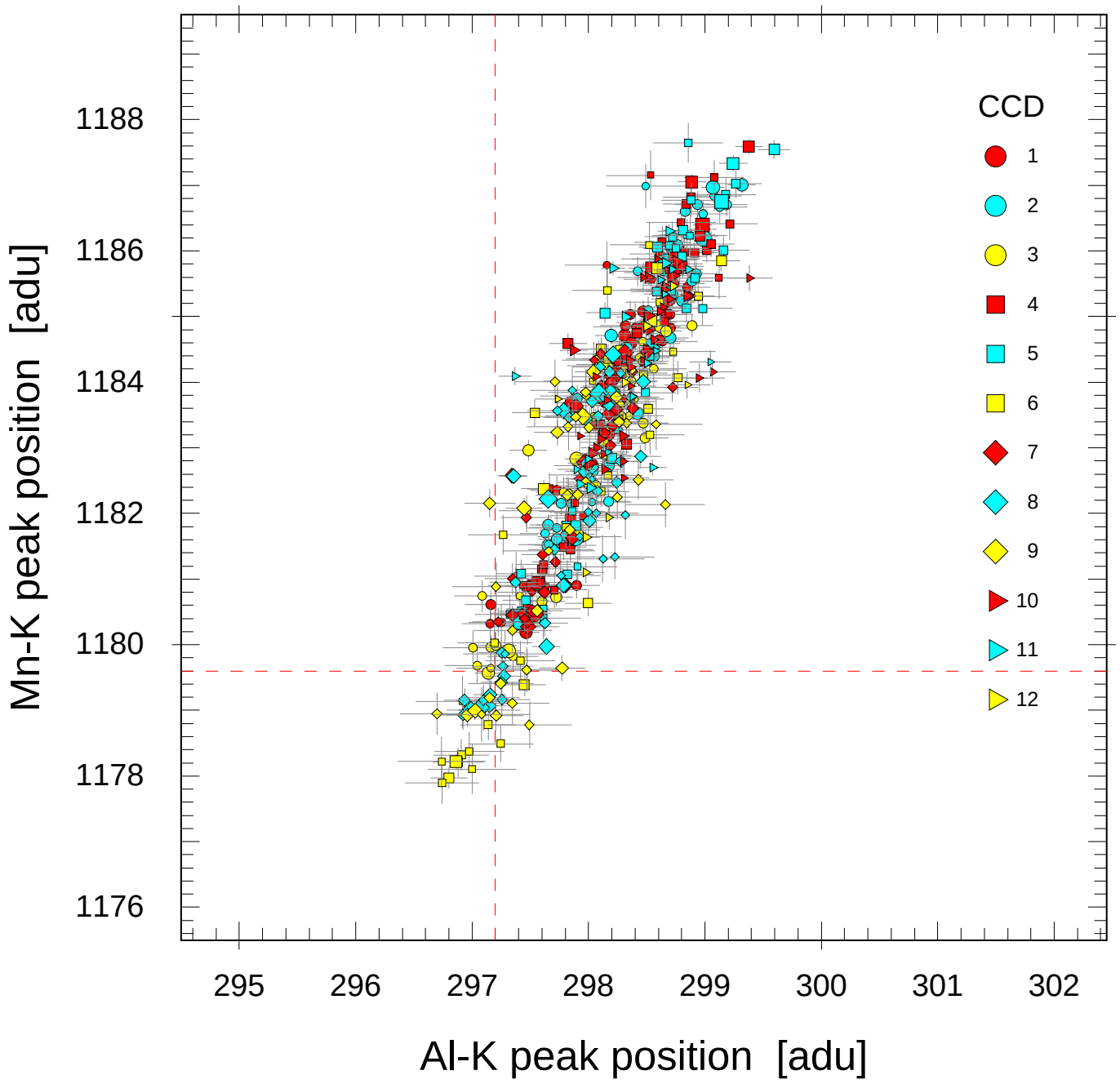
XMM - Newton / EPIC pn internal calibration source

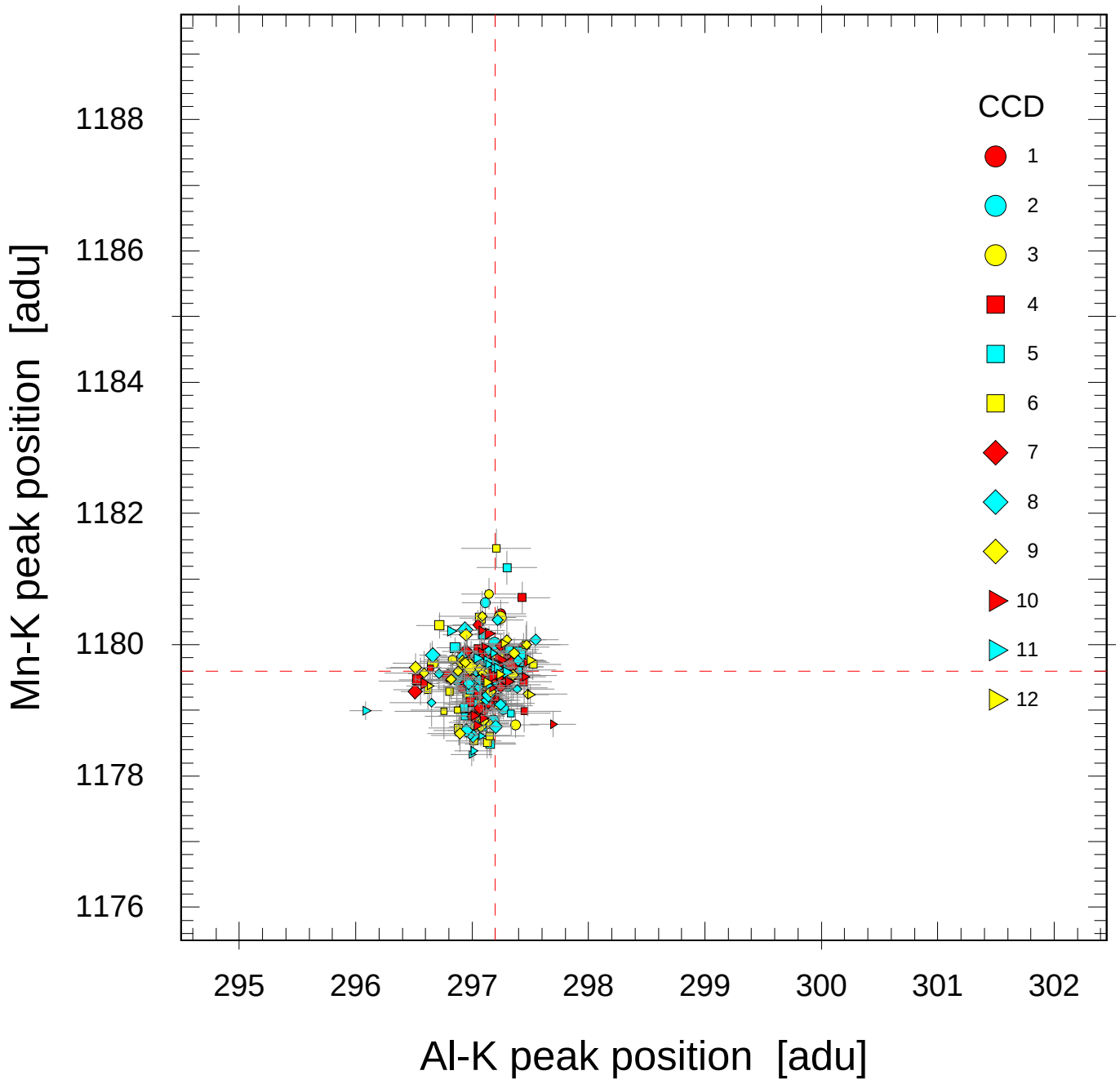


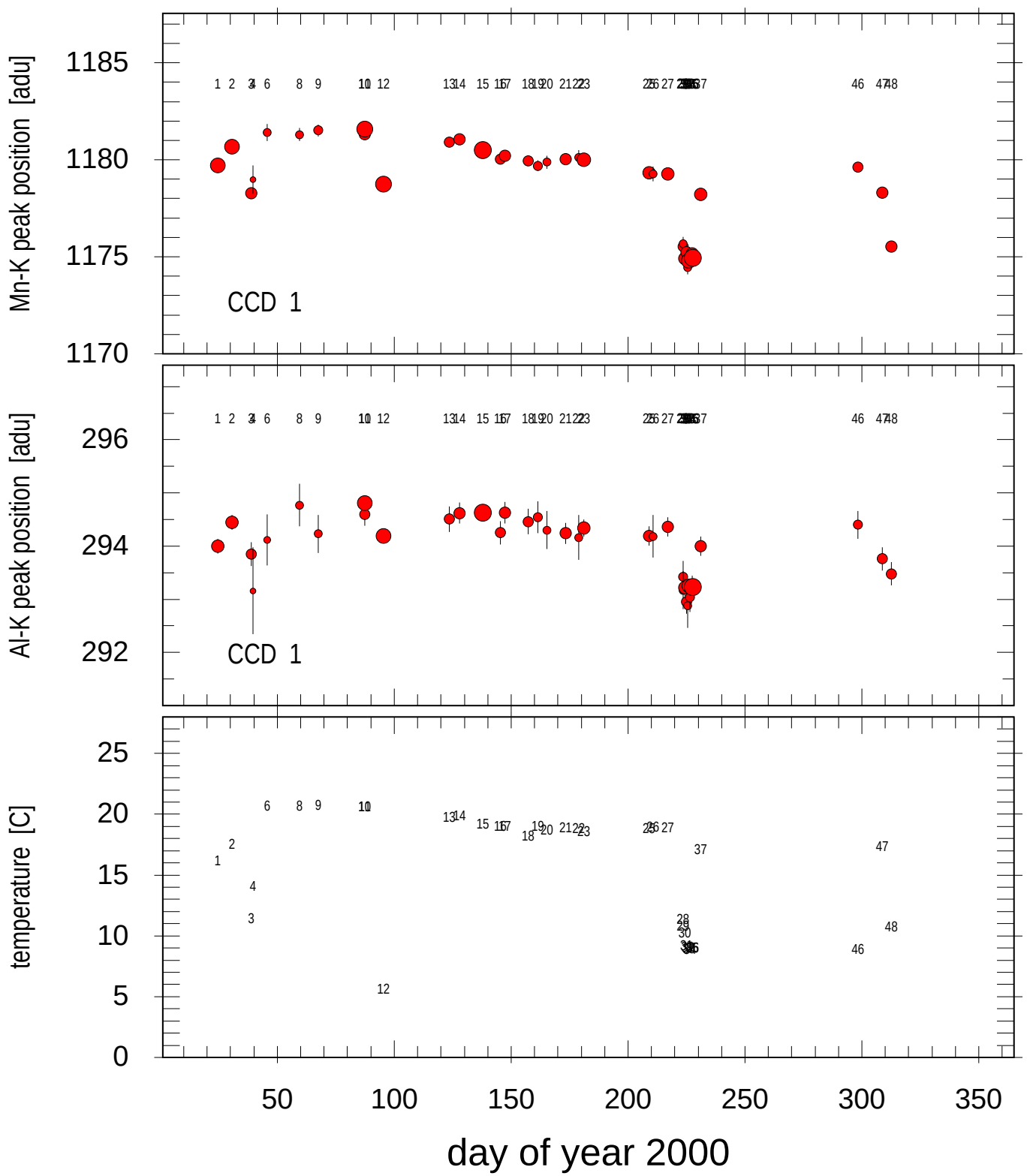

1184
1182
1180
1178
1176
1174
1172
Mn-K peak position [adu]
291
292
293
294
295
296
297
298
Al-K peak position [adu]
CCD
1
2
3
4
5
6
7
8
9
10
11
12

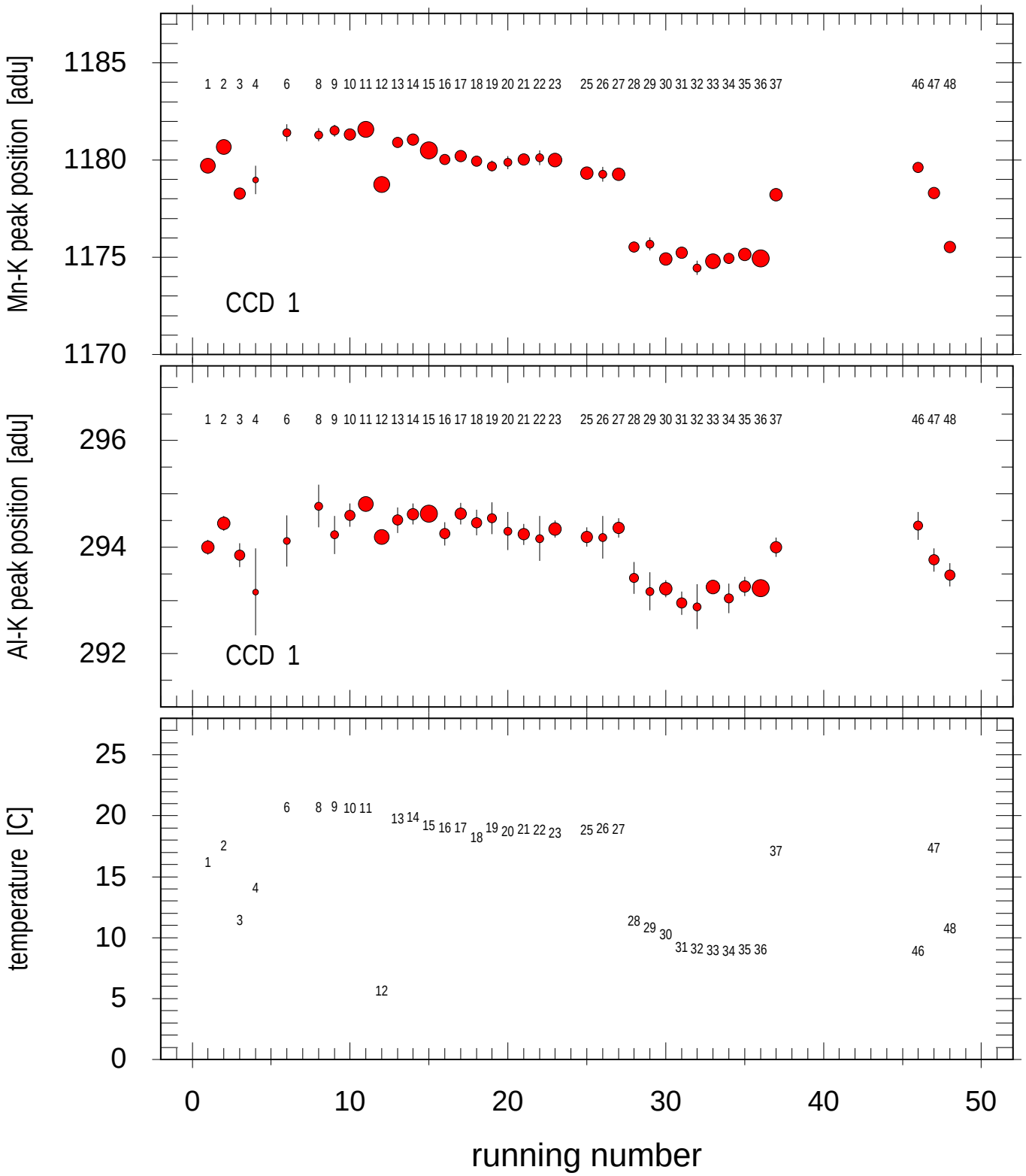

Mn-K peak position [adu]
1184
1182
1180
1178
1176
1174
1172
291
292
293
294
295
296
297
298
Al-K peak position [adu]
CCD
1
2
3
4
5
6
7
8
9
10
11
12


Mn-K peak position [adu]
1184
1182
1180
1178
1176
1174
1172
291
292
293
294
295
296
297
298
Al-K peak position [adu]
CCD
1
2
3
4
5
6
7
8
9
10
11
12

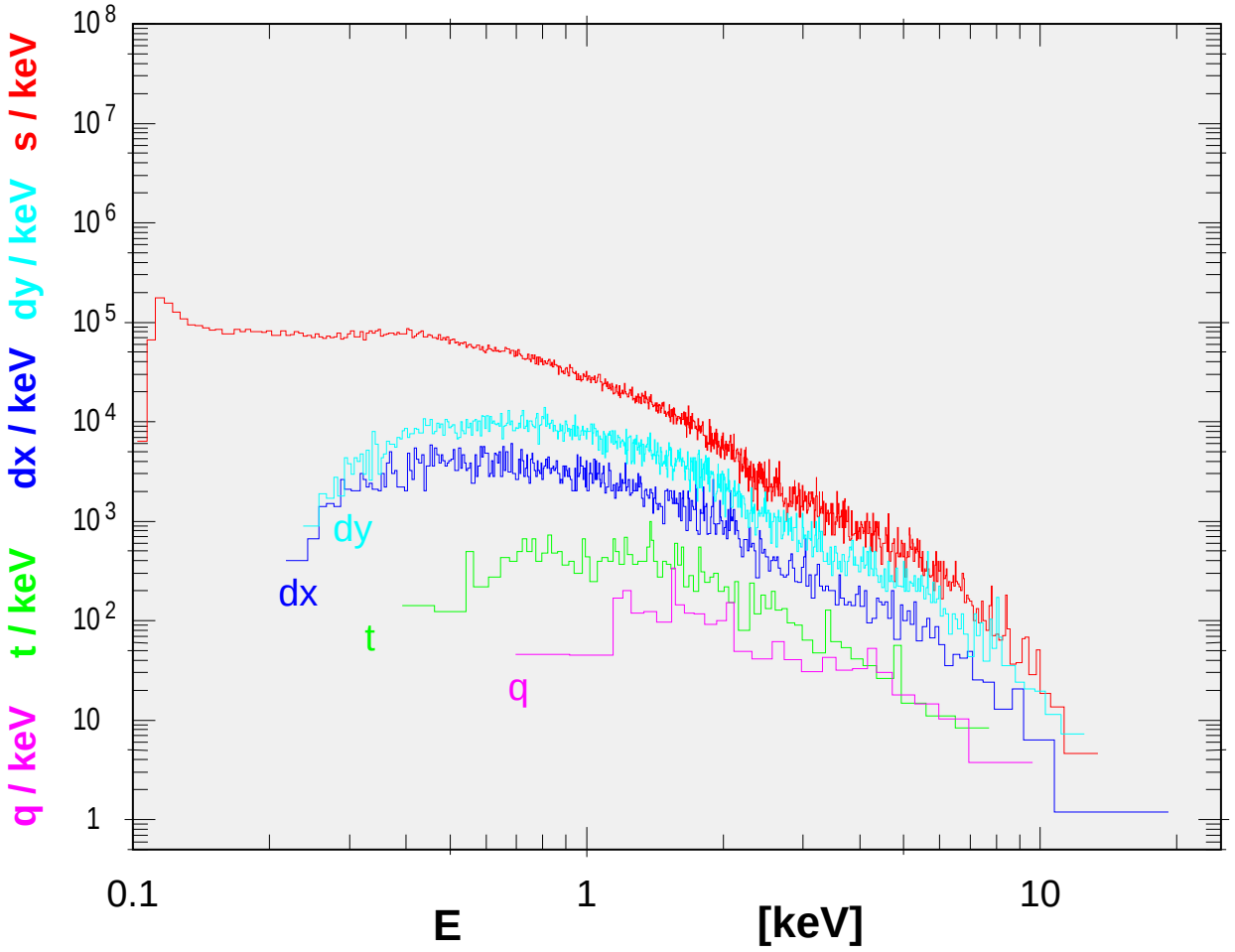

CCD
1
2
3
4
5
6
7
8
9
10
11
12
Mn-K peak position [adu]
1188
1186
1184
1182
1180
1178
1176
Al-K peak position [adu]
295
296
297
298
299
300
301
302

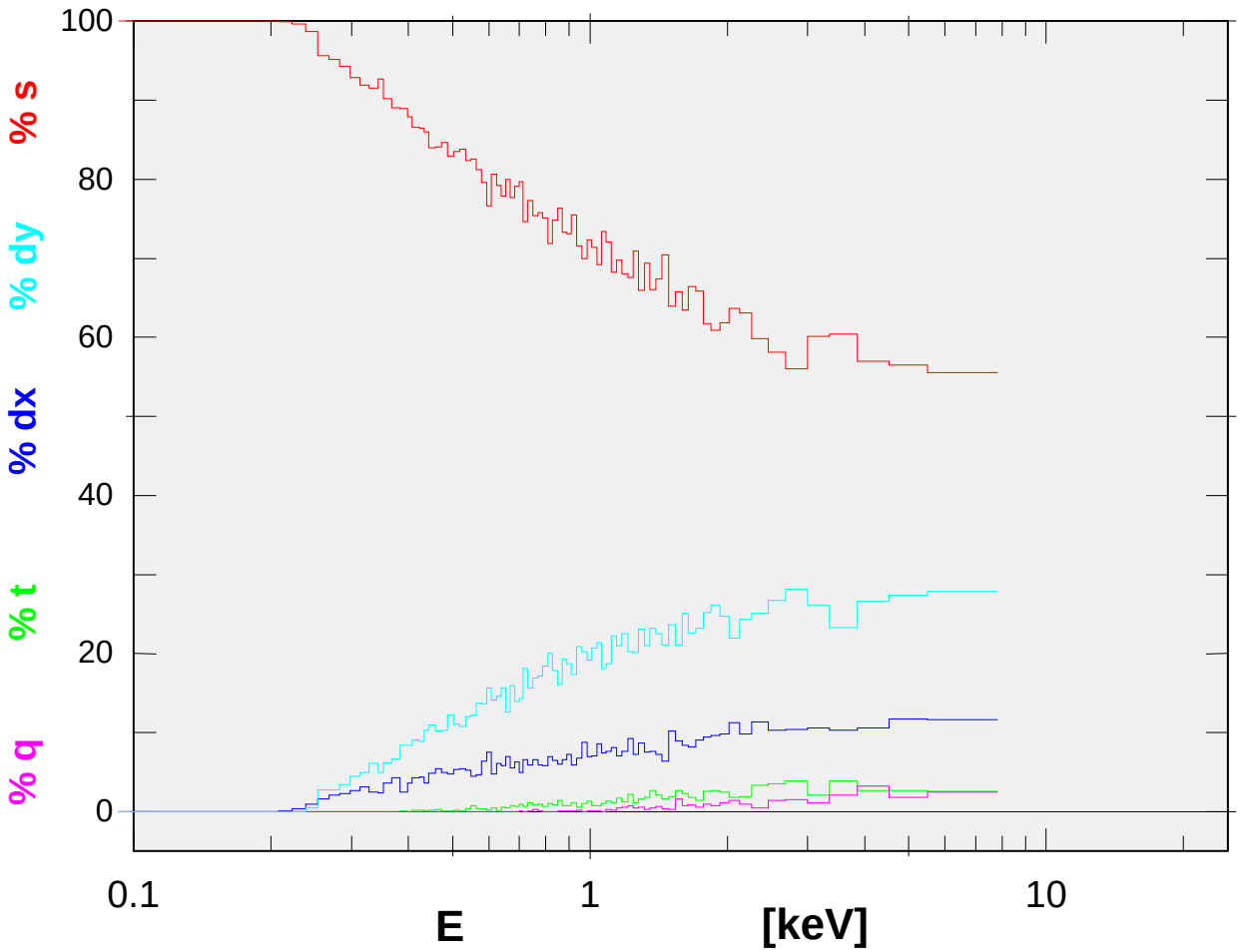

CCD
1
2
3
4
5
6
7
8
9
10
11
12
1188
1186
1184
1182
1180
1178
1176
Mn-K peak position [adu]
295
296
297
298
299
300
301
302
Al-K peak position [adu]


Mn-K peak position [adu]
1185
1180
1175
1170
CCD 1
Al-K peak position [adu]
296
294
292
CCD 1
temperature [C]
25
20
15
10
5
0
50
100
150
200
250
300
350
day of year 2000

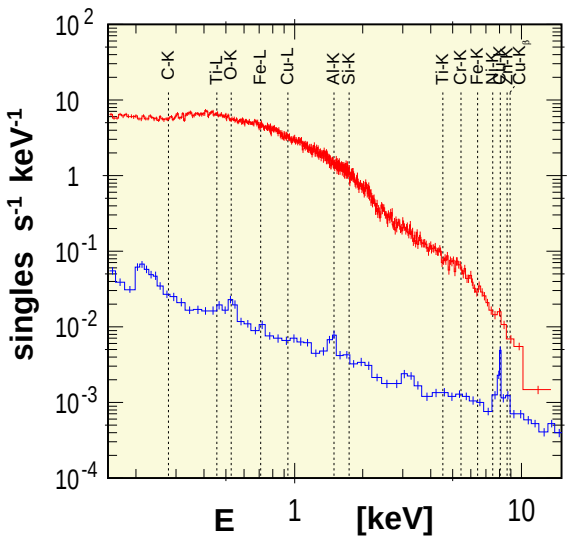

Mn-K peak position [adu]
1185
1180
1175
1170
CCD 1
Al-K peak position [adu]
296
294
292
CCD 1
temperature [C]
25
20
15
10
5
0
0
10
20
30
40
50
running number

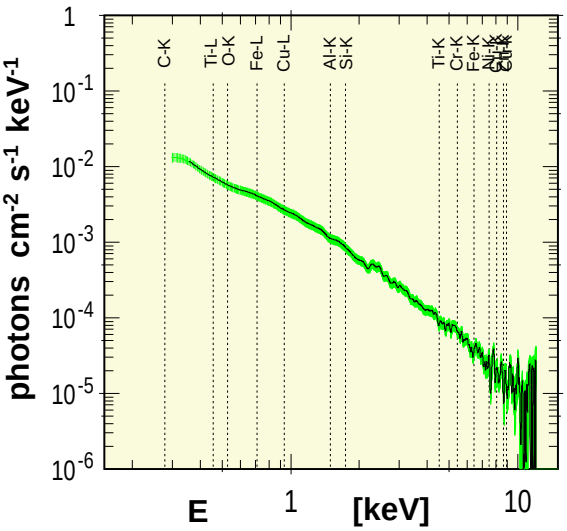
XMM / EPIC pn s01 pn063001.001





XMM / EPIC pn s01 b01 s01 - b01 pn063001.001

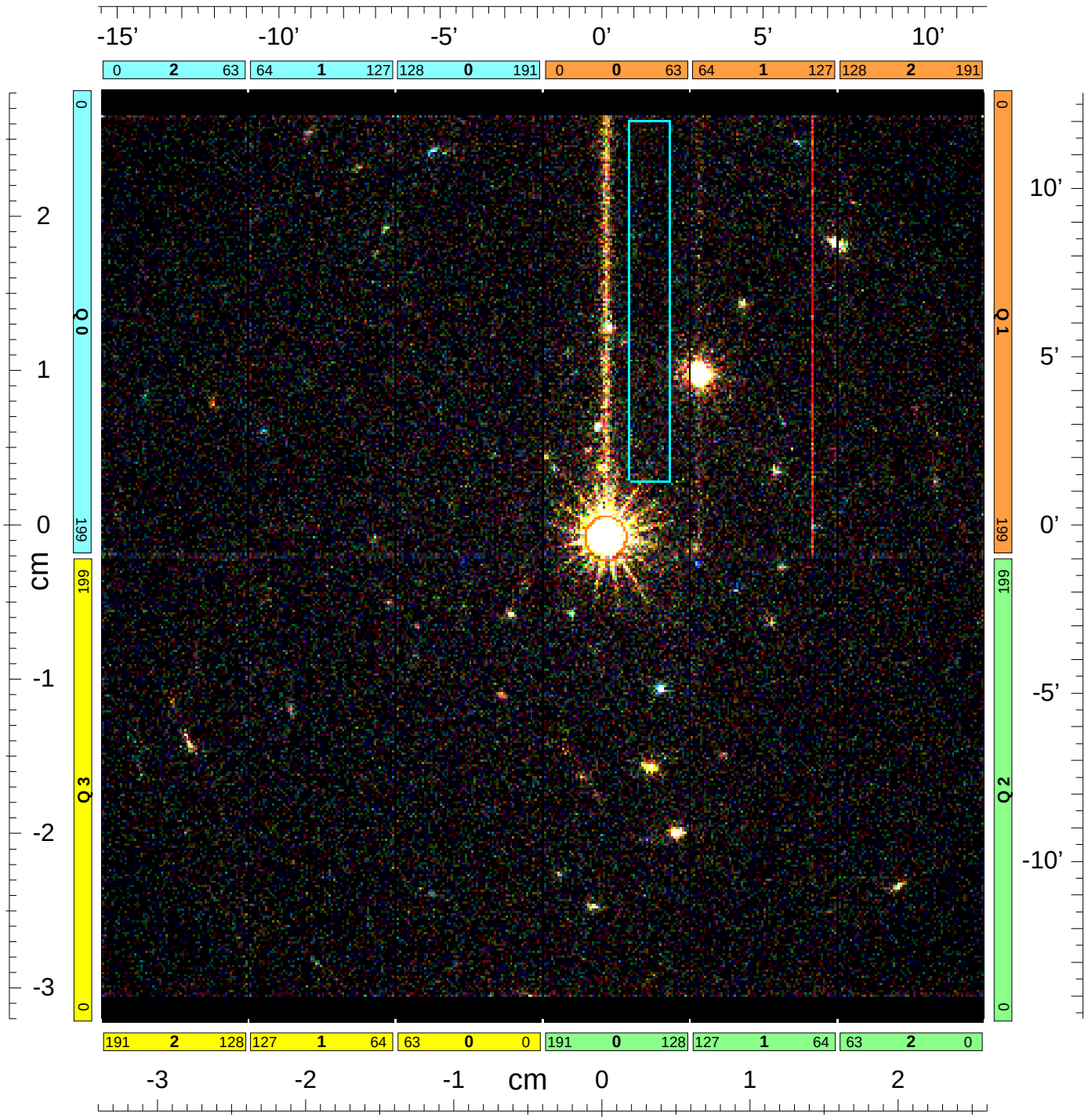




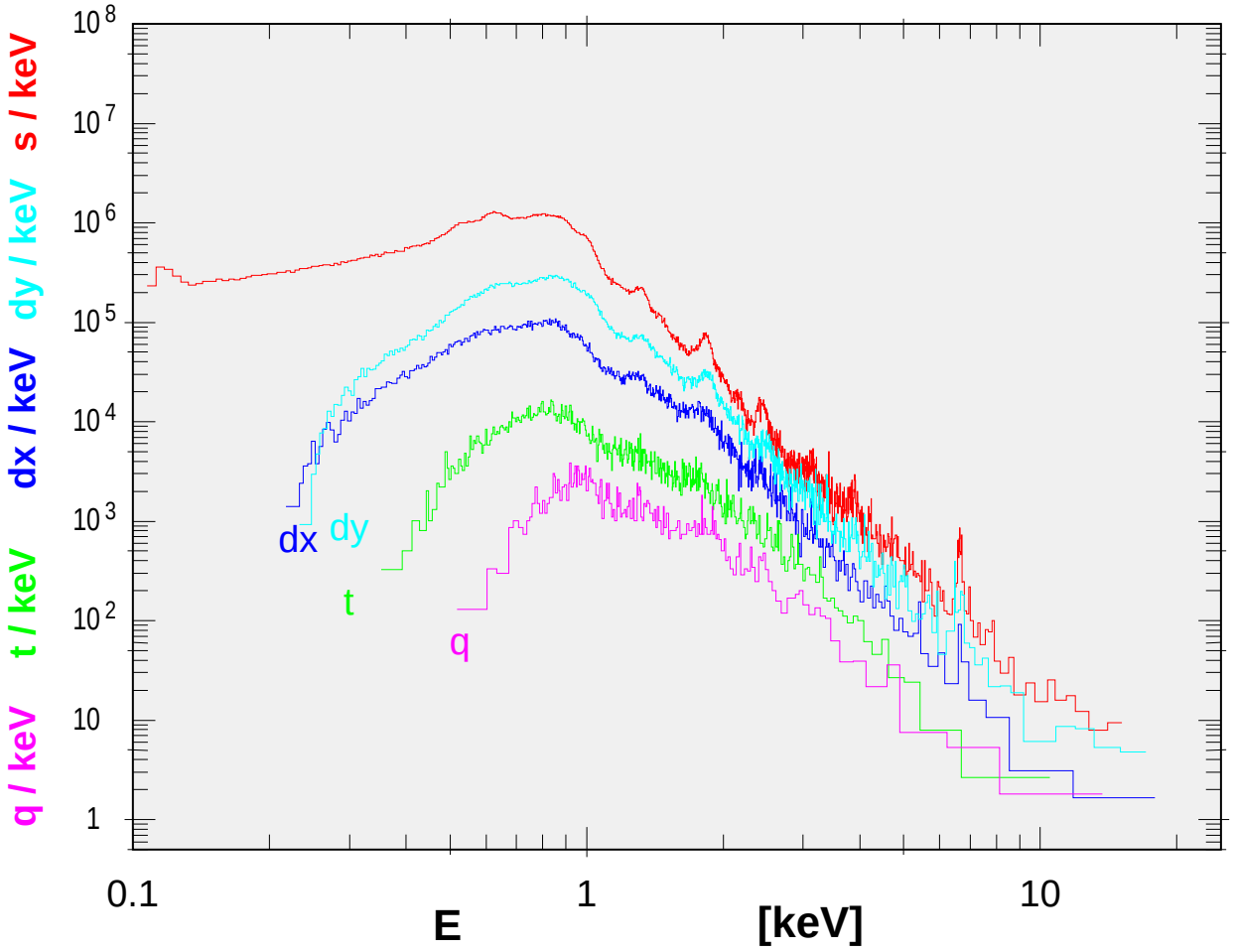
(net) exp.: 13.4 ks
filter : thin
s / ph = 0.70 (ass.)

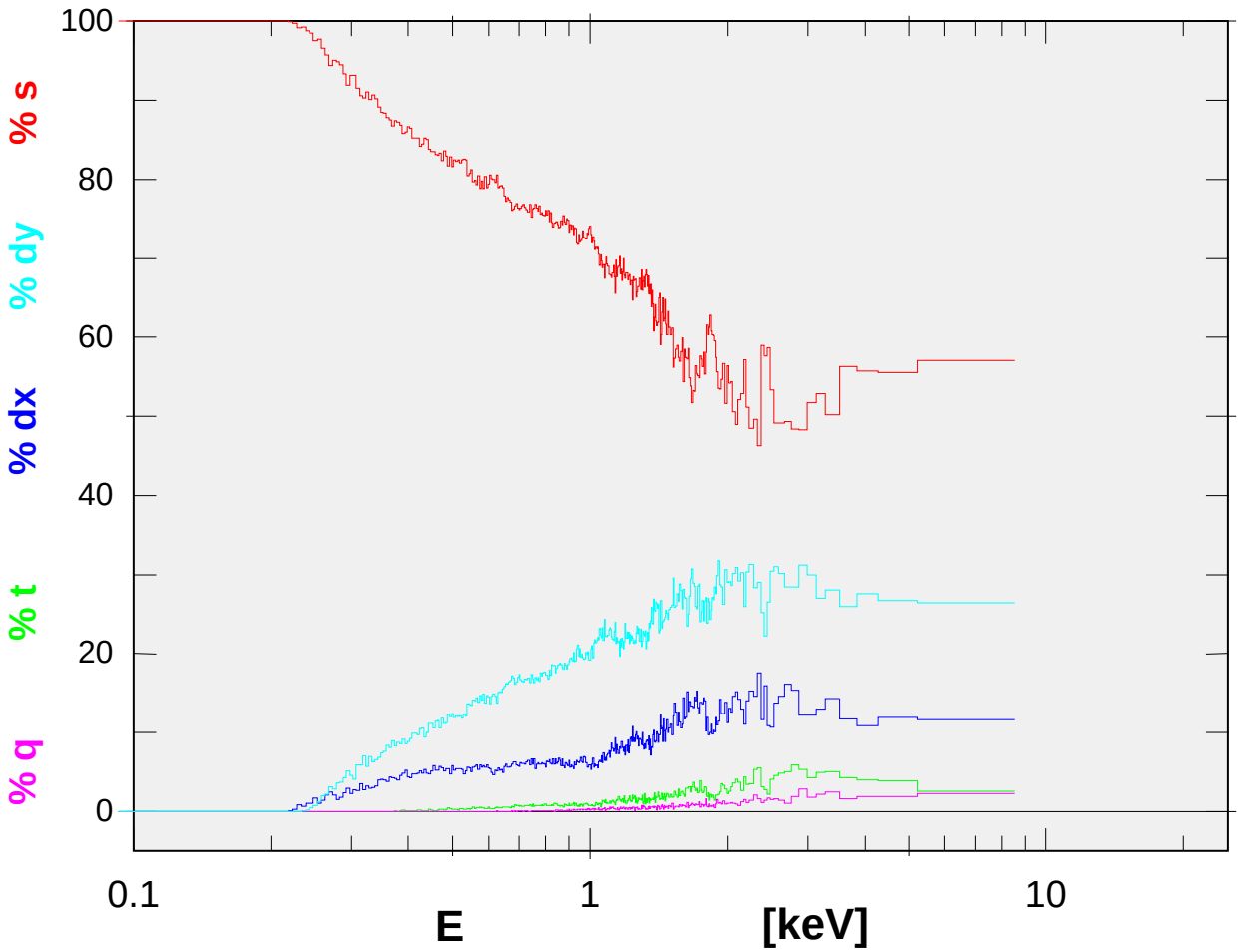
area:	s01	b01
pixels	290	2963
cm^2	0.07	0.67
arcmin^2	1.4	14.0

ph. flux [10^{-3} cm^{-2} s^{-1}]	
0.3 - 0.5	1.8875 +/- 0.0152
0.5 - 0.7	0.9924 +/- 0.0084
0.7 - 0.9	0.6972 +/- 0.0067
0.9 - 1.3	0.8425 +/- 0.0071
1.3 - 2.0	0.6884 +/- 0.0064
2.0 - 4.0	0.5841 +/- 0.0072
4.0 - 7.0	0.1991 +/- 0.0042
7.0 - 12.	0.0761 +/- 0.0050
0.3 - 12.	5.9674 +/- 0.0231

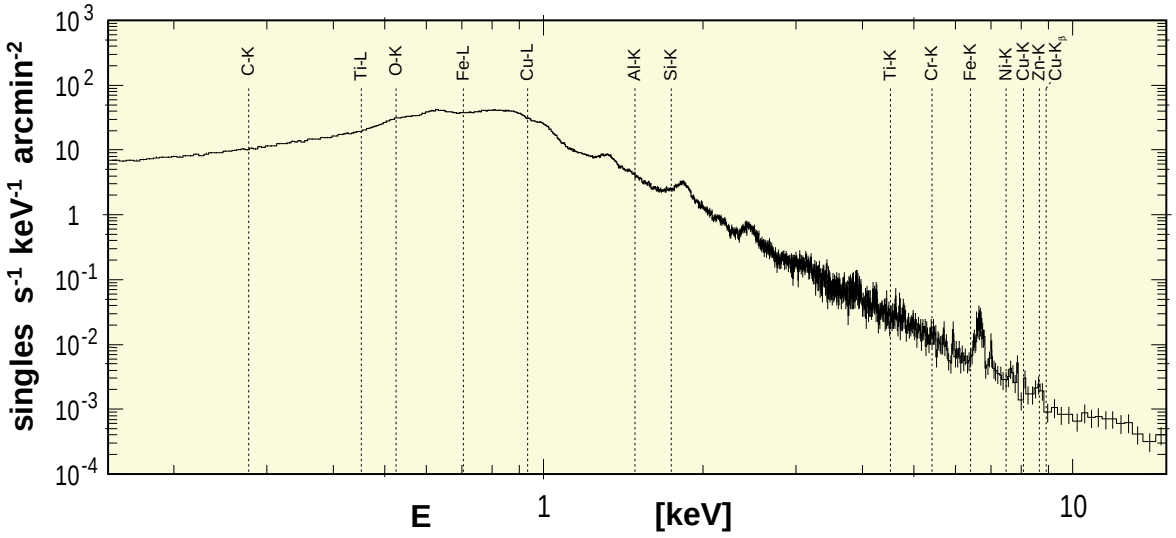


XMM / EPIC pn s01 pn076101.008



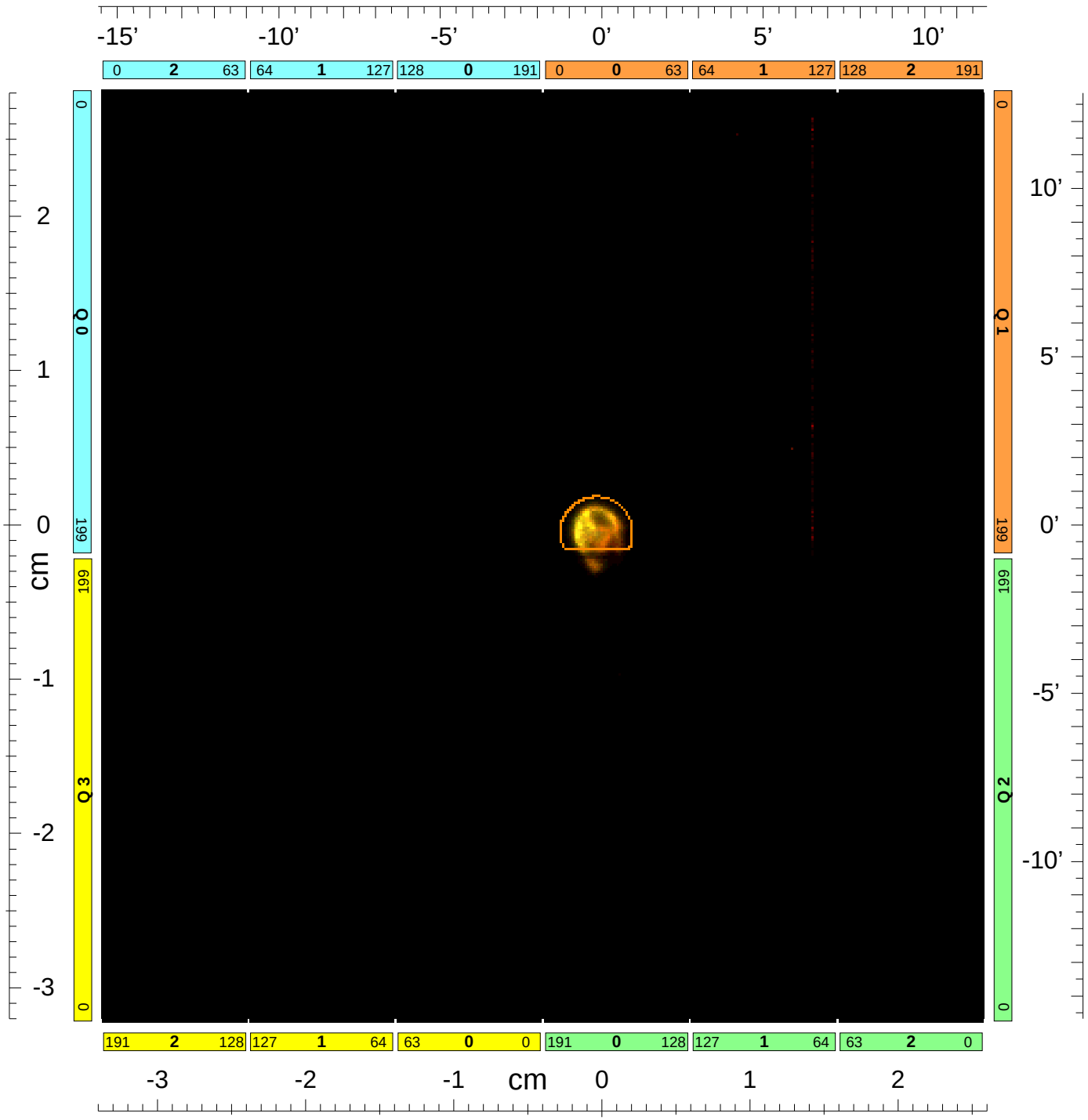


XMM / EPIC pn s01 pn076101.008

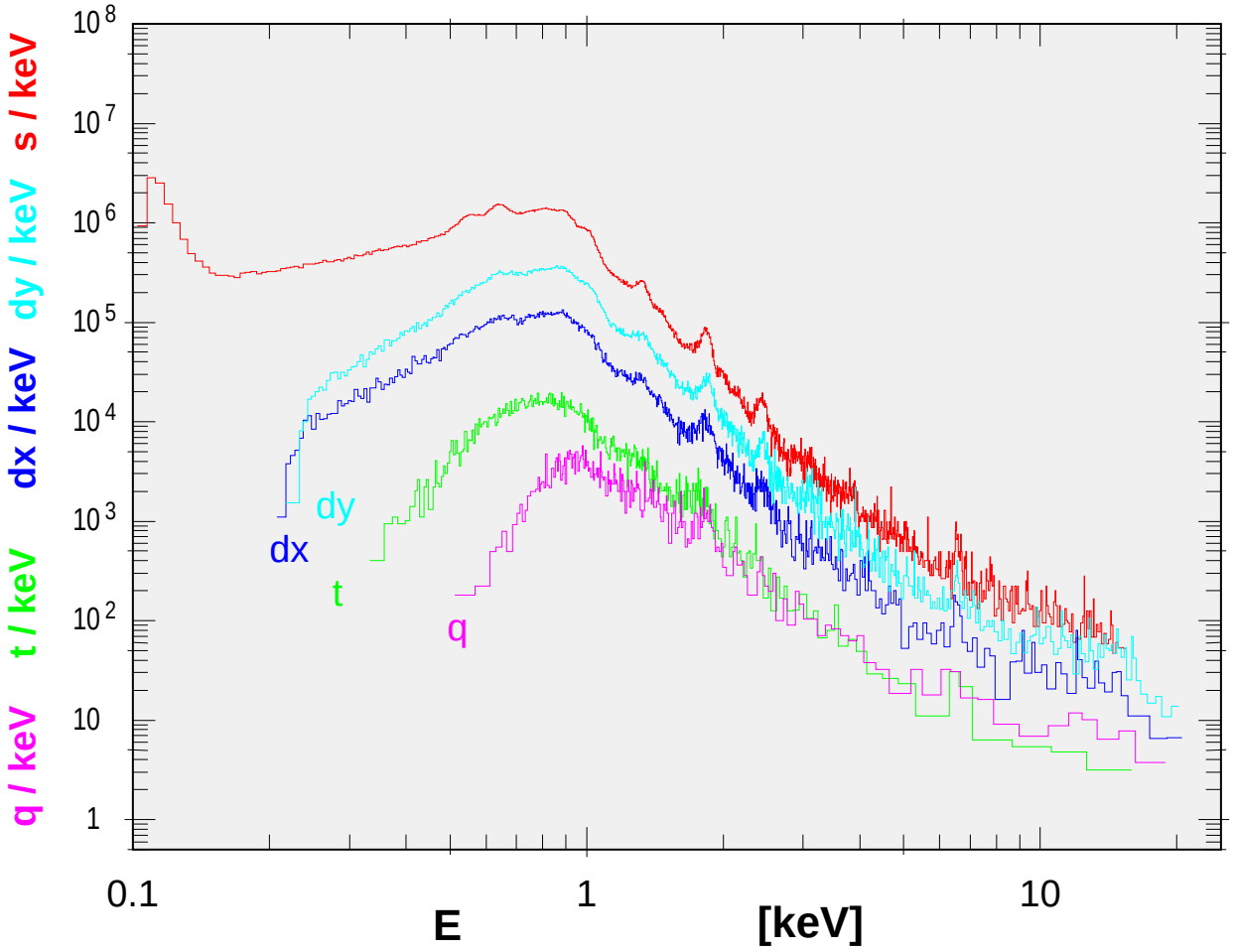


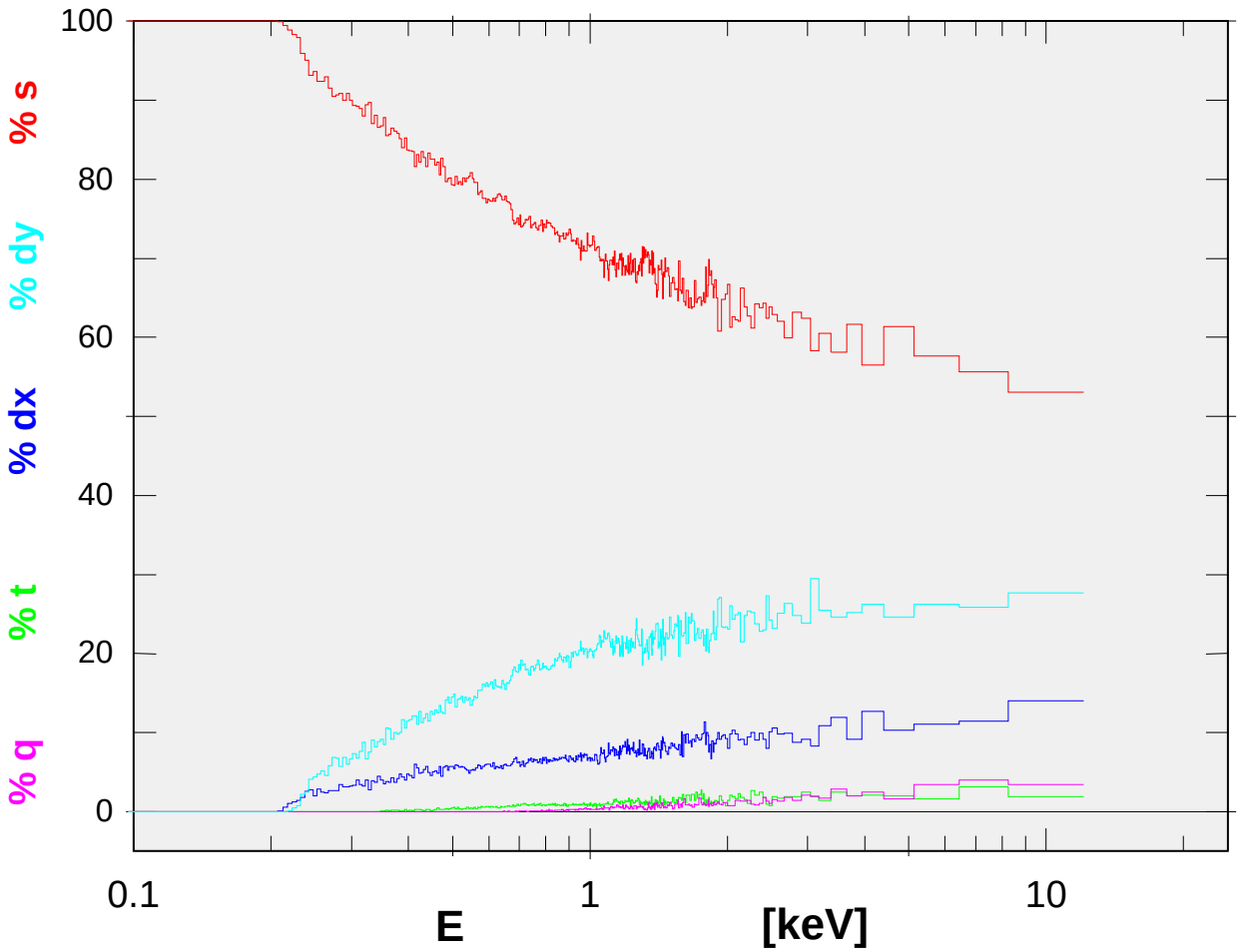
(net) exp.: 12.6 ks
filter : medium
s / ph = 0.70 (ass.)

area:	s01
pixels	651
cm^2	0.15
arcmin^2	3.1

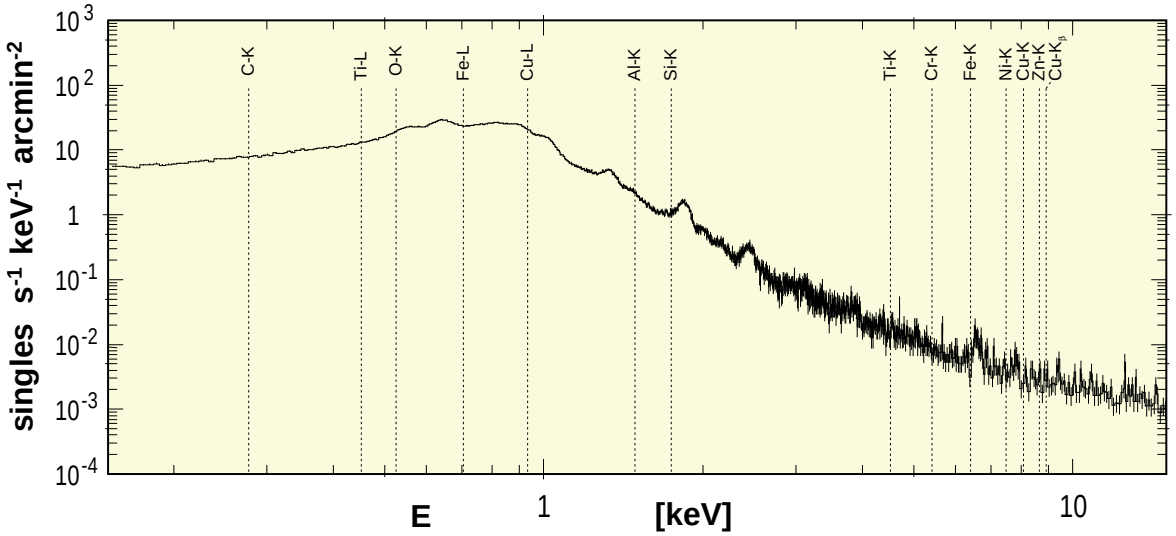


XMM / EPIC pn s01 pn083001.001



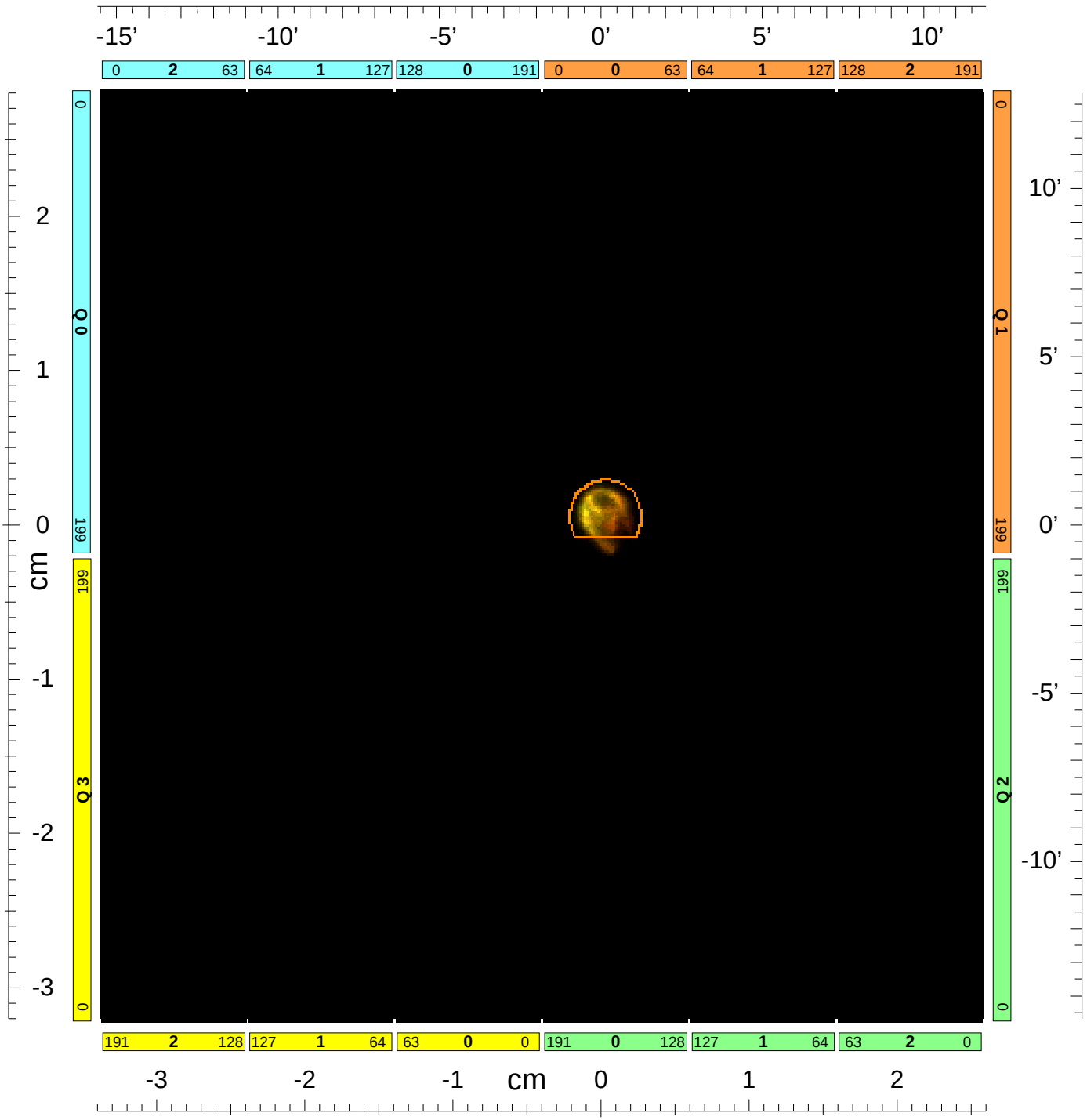


XMM / EPIC pn s01 pn083001.001

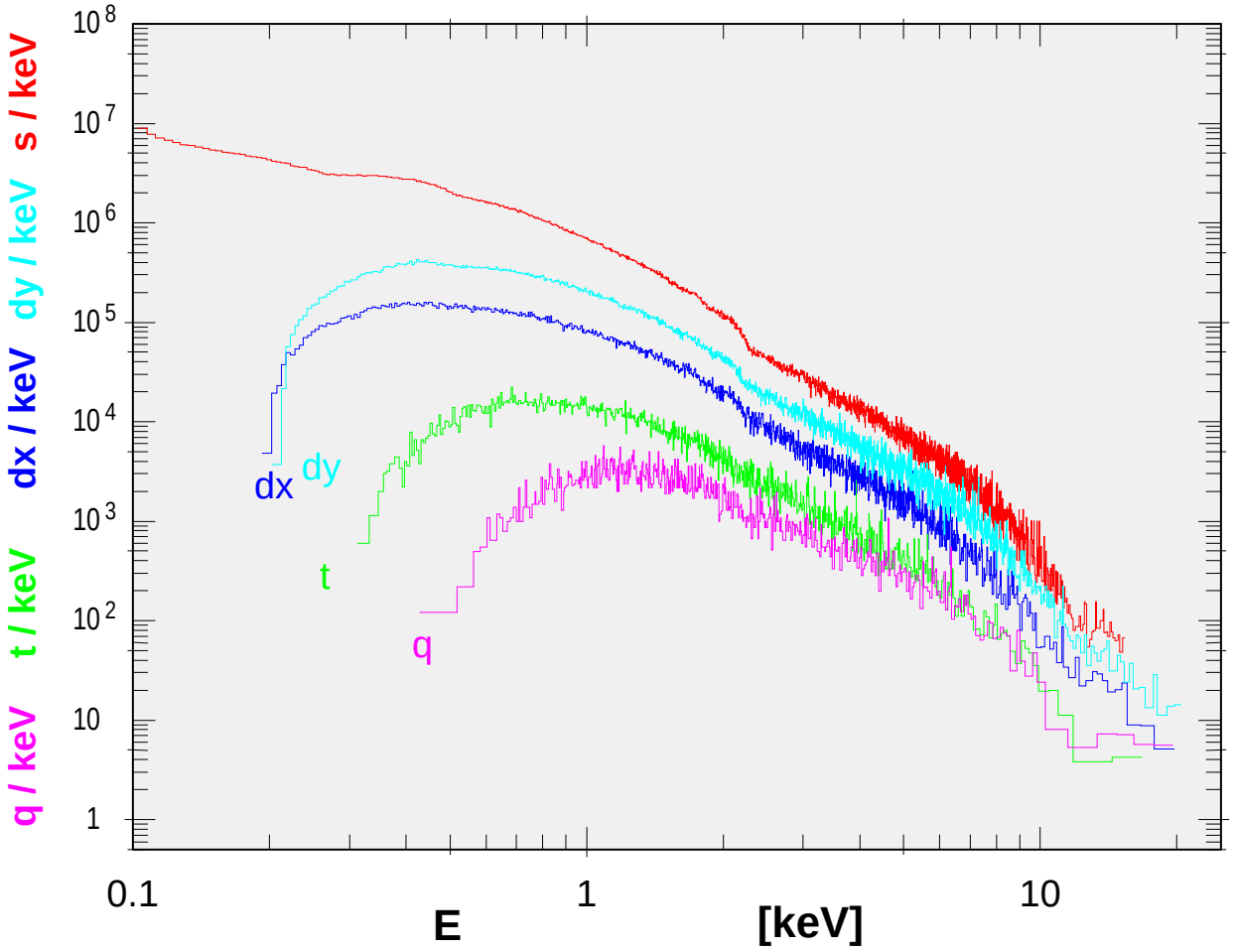


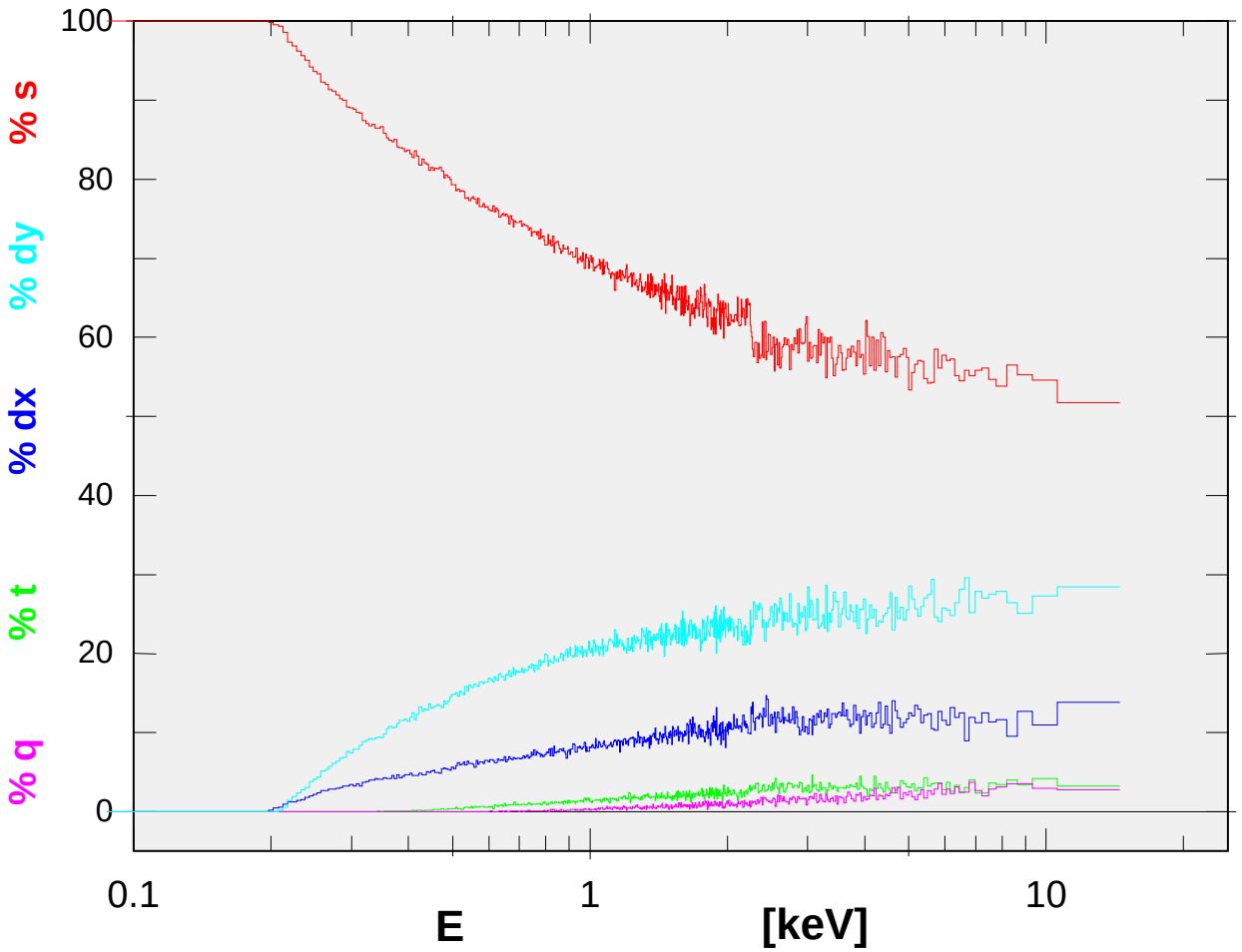
(net) exp.: 15.4 ks
filter : medium
s / ph = 0.70 (ass.)

area:	s01
pixels	719
cm^2	0.16
arcmin^2	3.4

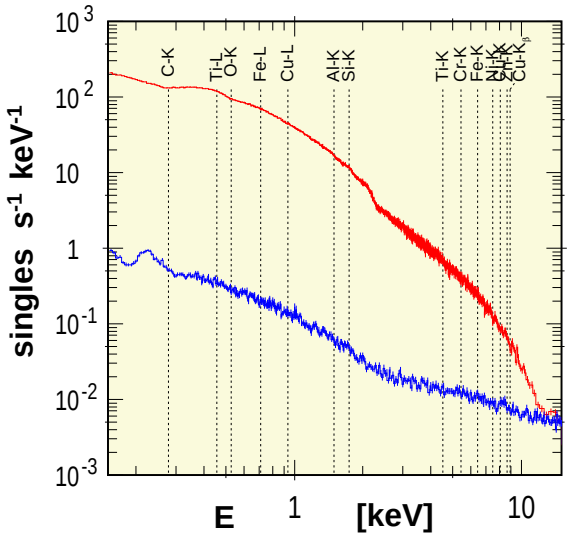


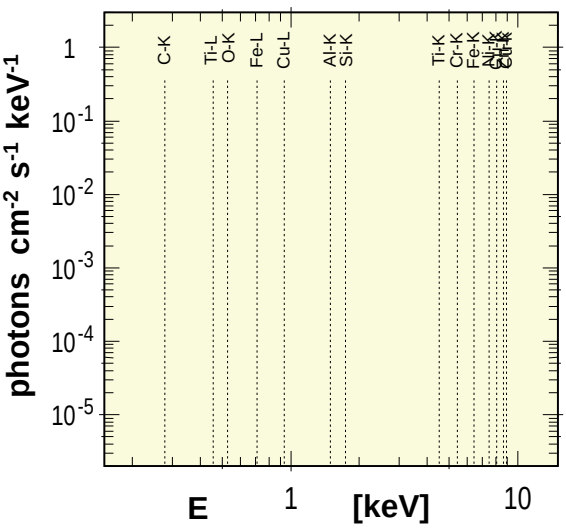
XMM / EPIC pn s01 pn087301.010





XMM / EPIC pn s01 b01 s01 - b01 pn087301.010

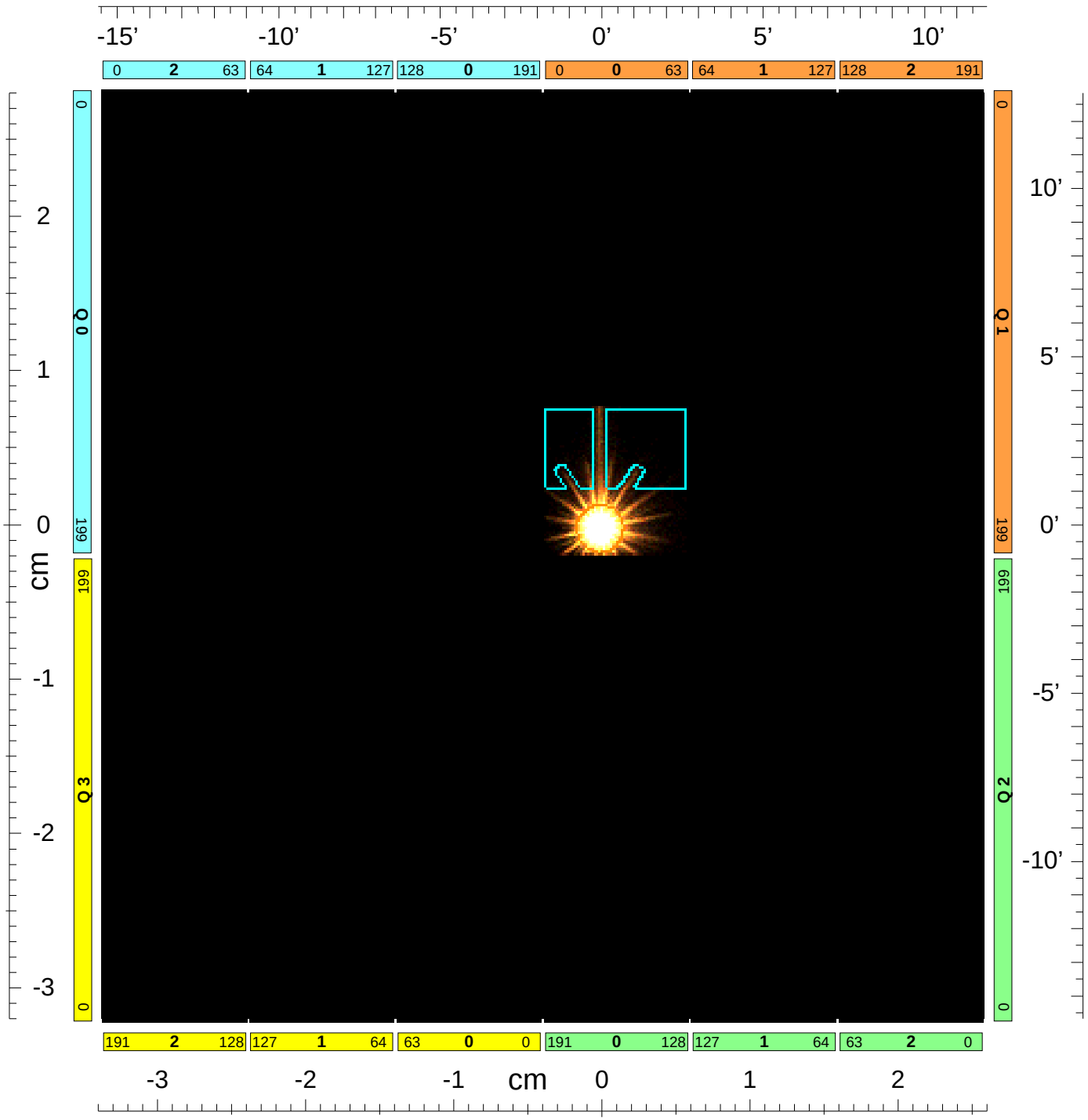




(net) exp.: 25.2 ks
filter : medium
s / ph = 0.70 (ass.)

area:	s01	b01
pixels	367	1931
cm^2	0.08	0.43
arcmin^2	1.7	9.1

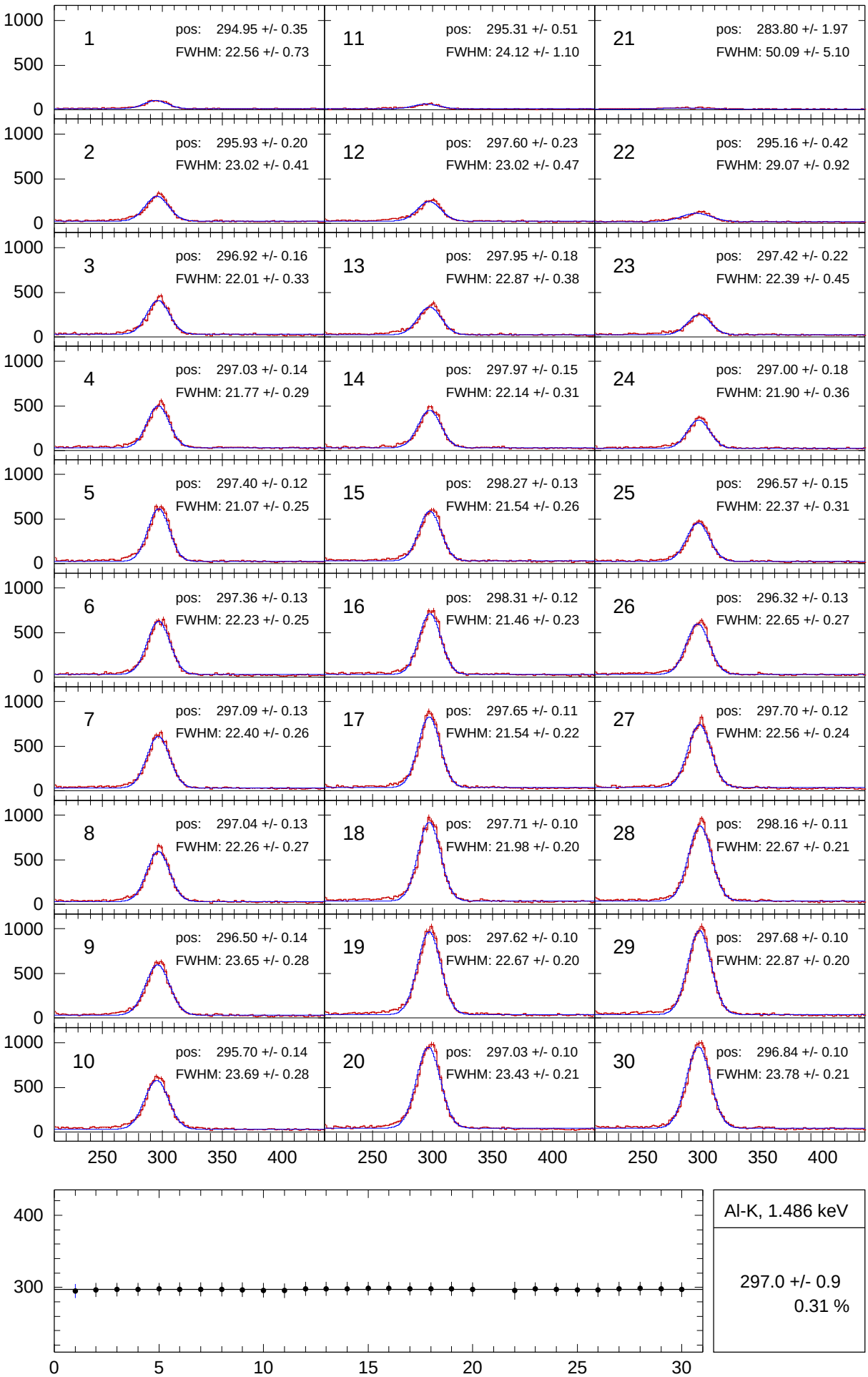
ph. flux [10^{-3} cm^{-2} s^{-1}]	
0.3 - 0.5	44.8083 +/- 0.0607
0.5 - 0.7	17.0020 +/- 0.0261
0.7 - 0.9	10.3322 +/- 0.0190
0.9 - 1.3	11.0522 +/- 0.0190
1.3 - 2.0	7.7717 +/- 0.0158
2.0 - 4.0	5.5514 +/- 0.0163
4.0 - 7.0	1.4880 +/- 0.0084
7.0 - 12.	0.5011 +/- 0.0091
0.3 - 12.	98.5070 +/- 0.0759



corrected with CTE and gain model of 17-Feb-2000

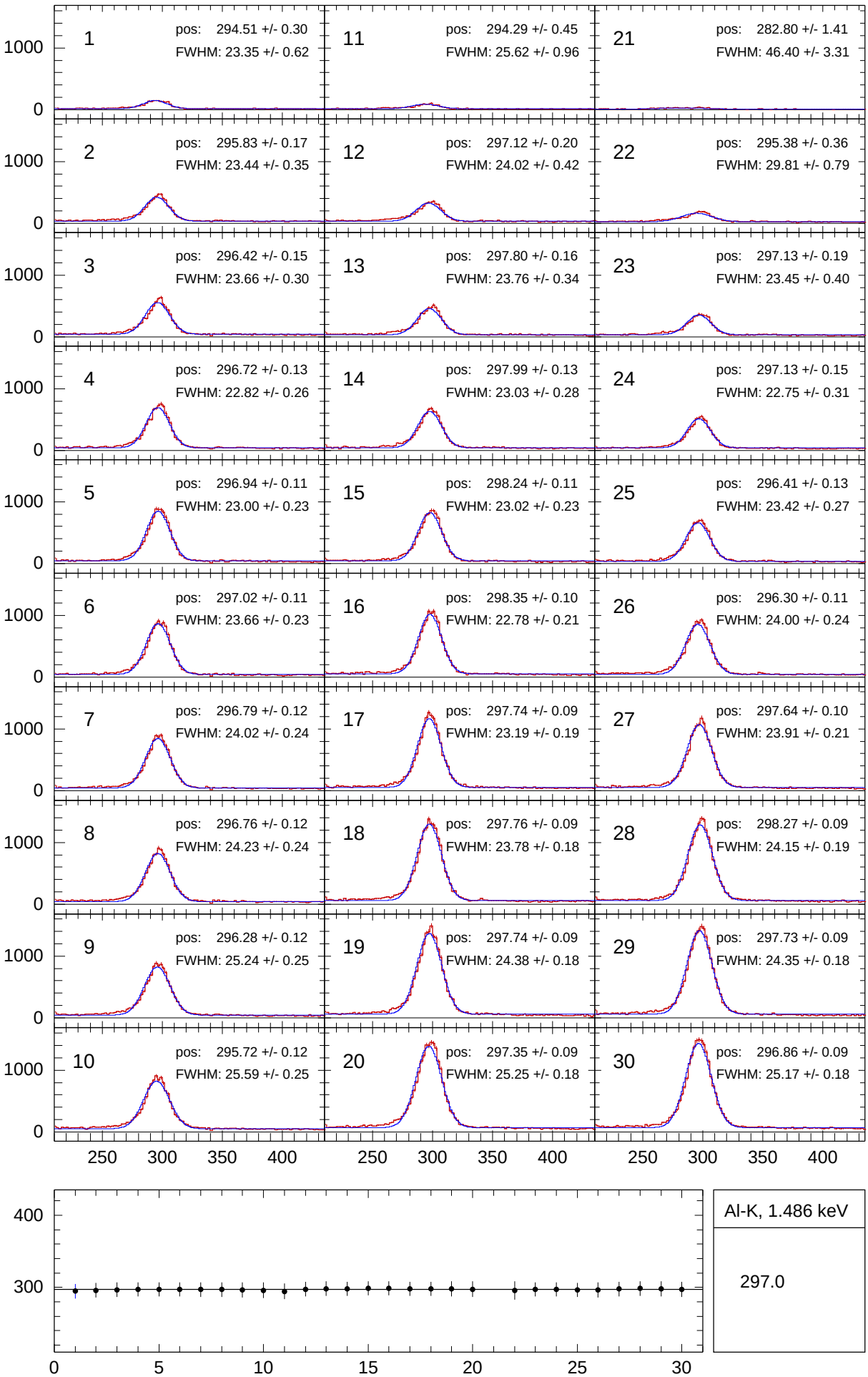
pn125101_015_0.fits

first singles



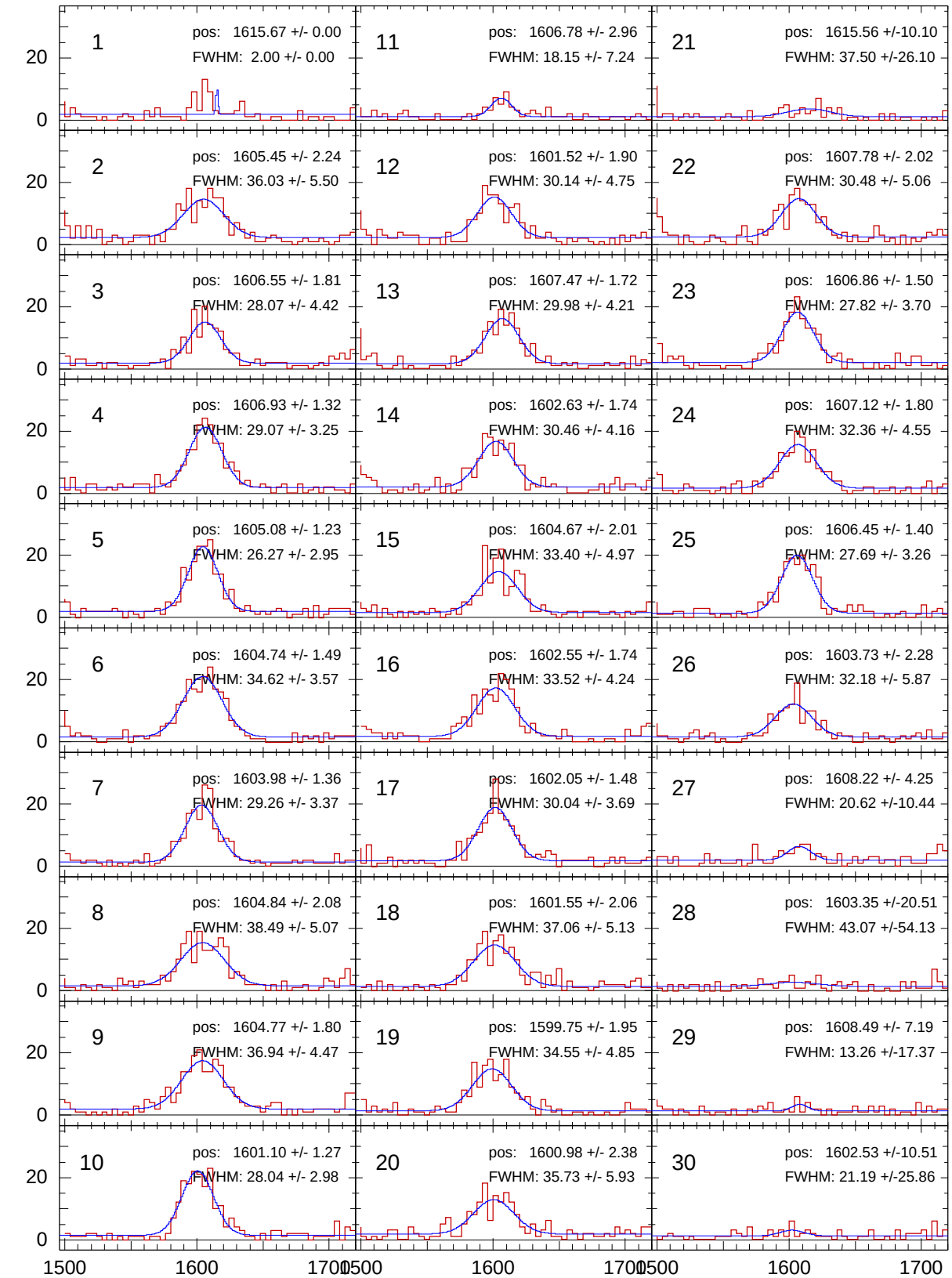
corrected with CTE and gain model of 17-Feb-2000

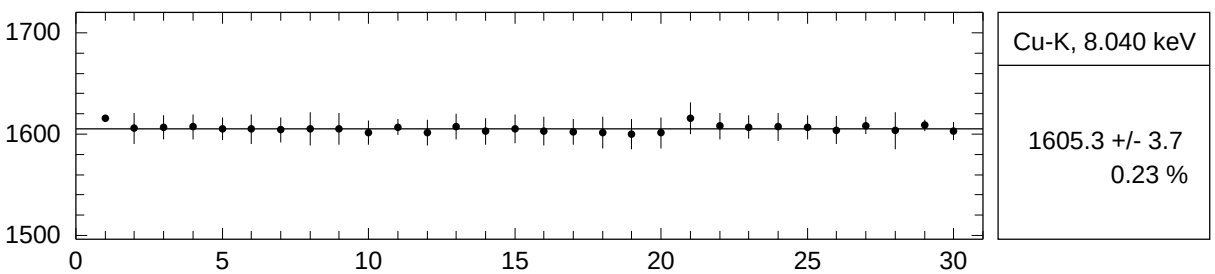
pn125101_015_0.fits all recognized photons



corrected with CTE and gain model of 17-Feb-2000

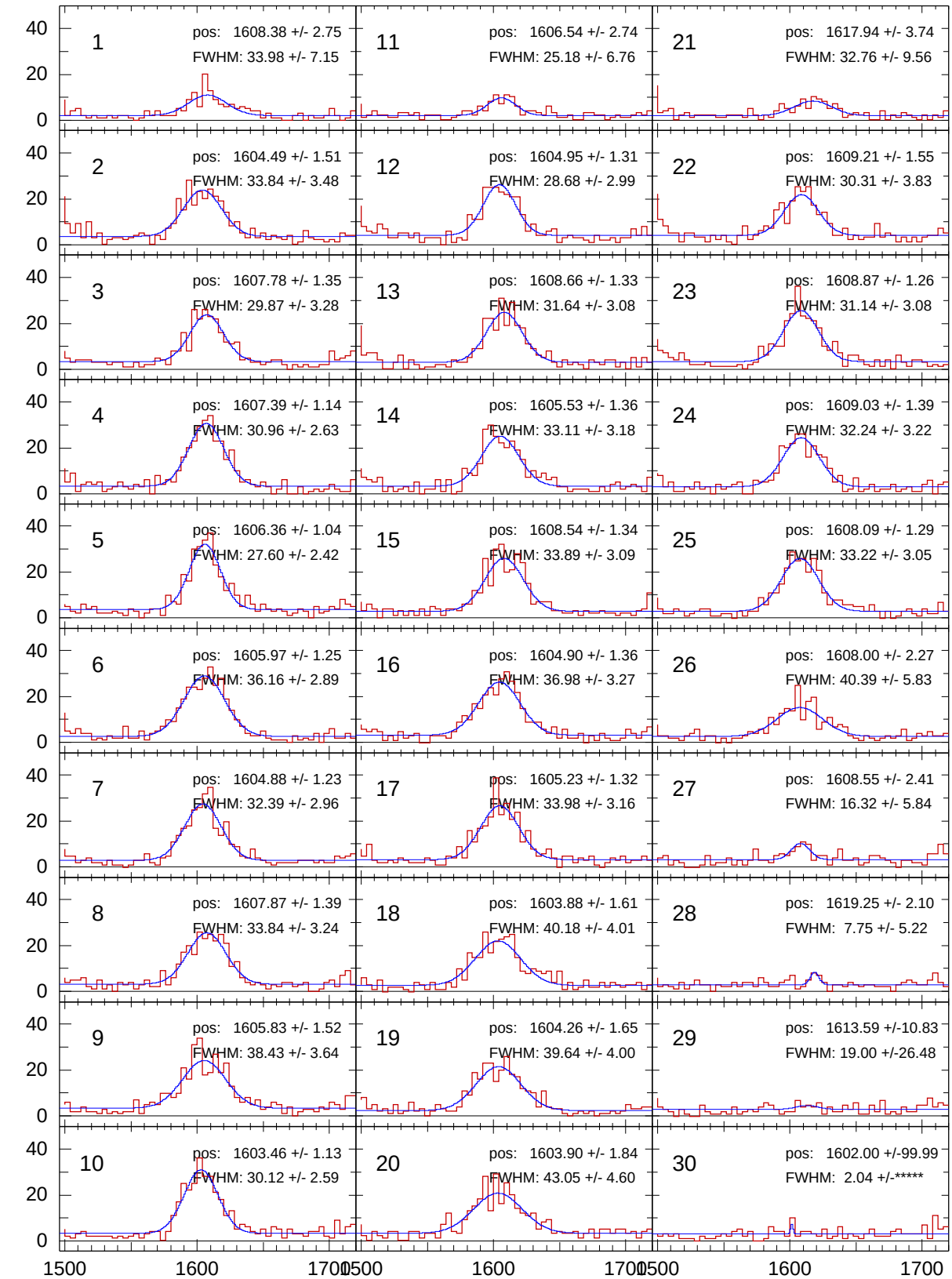
pn125101_015_0.fits first singles





corrected with CTE and gain model of 17-Feb-2000

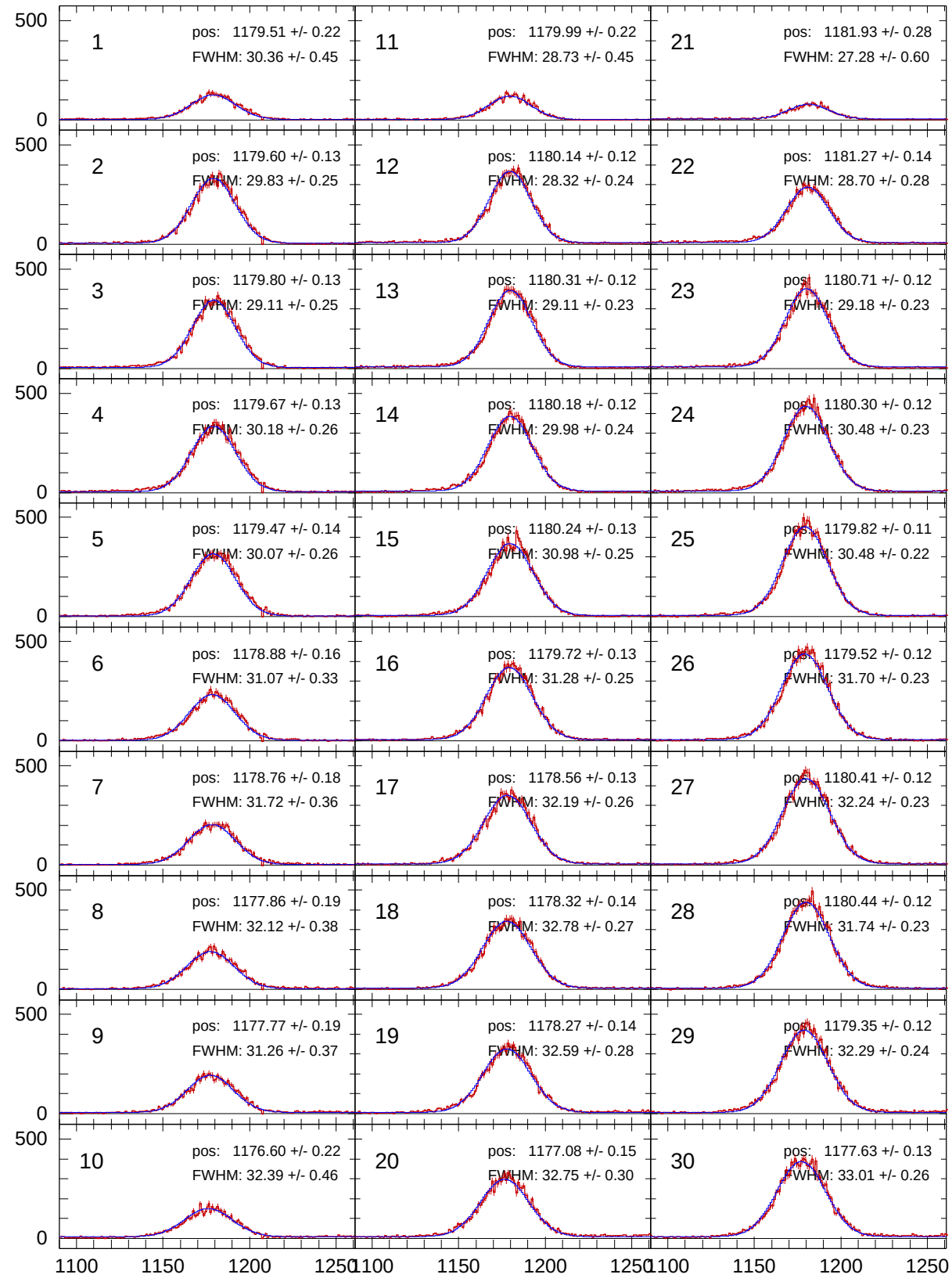
pn125101_015_0.fits all recognized photons

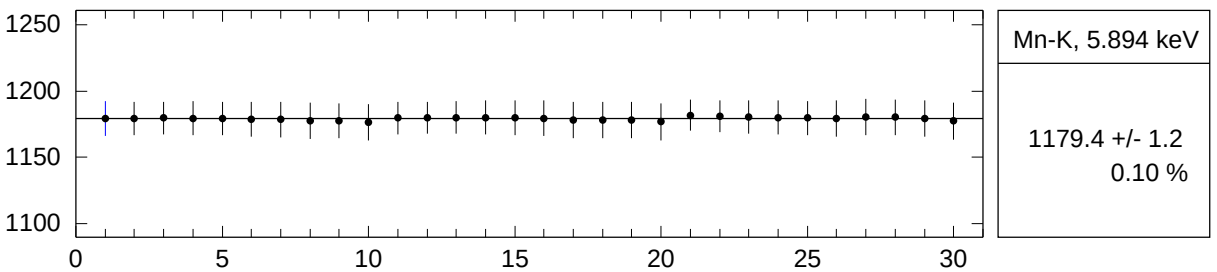


corrected with CTE and gain model of 17-Feb-2000

pn125101_015_0.fits

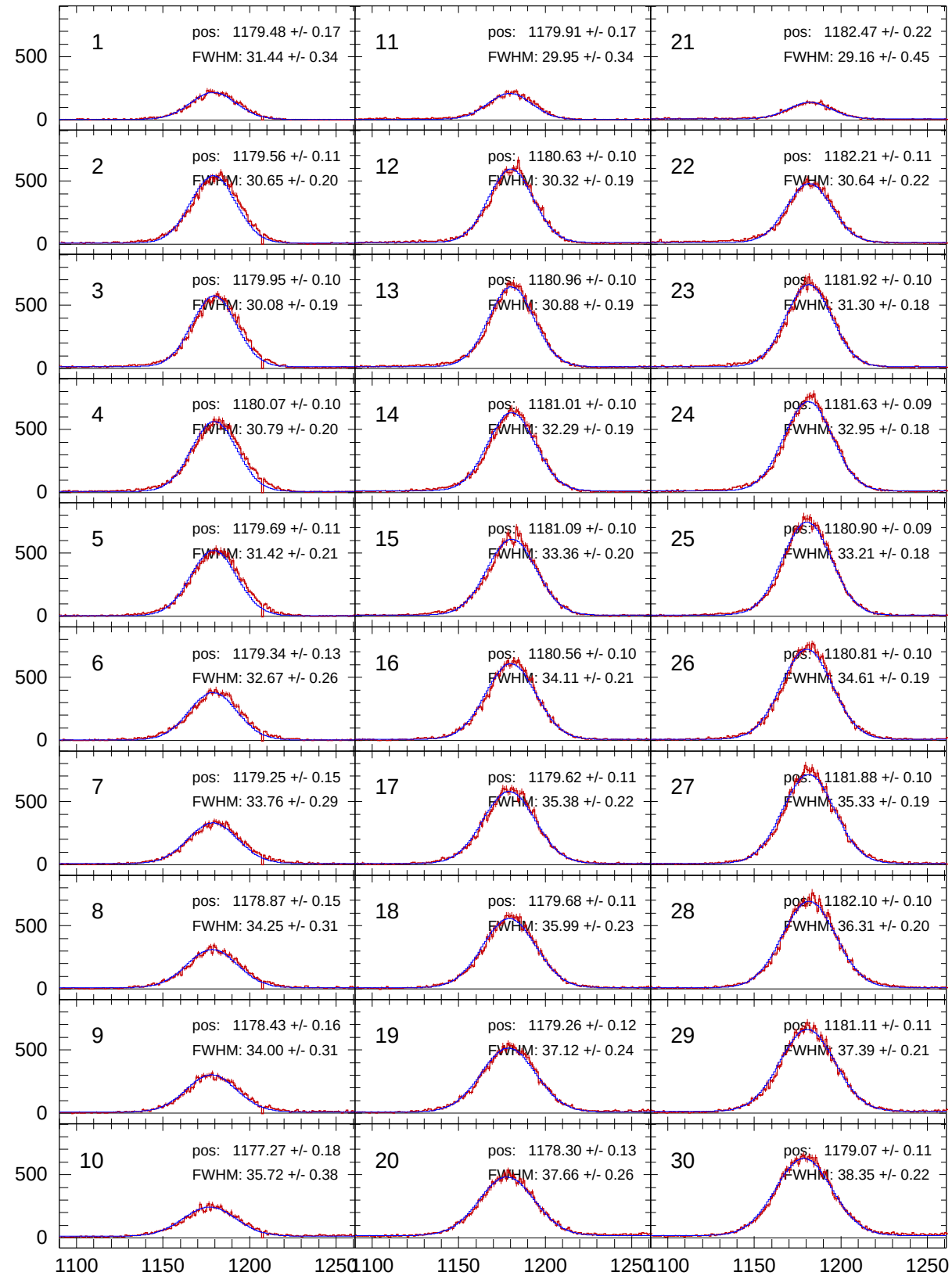
first singles

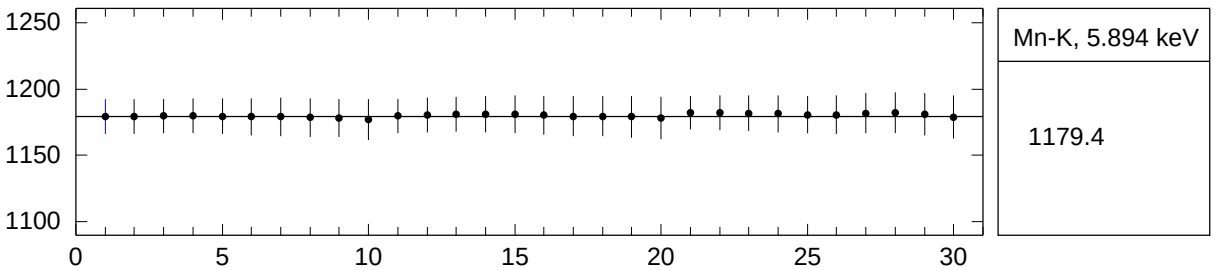




corrected with CTE and gain model of 17-Feb-2000

pn125101_015_0.fits all recognized photons





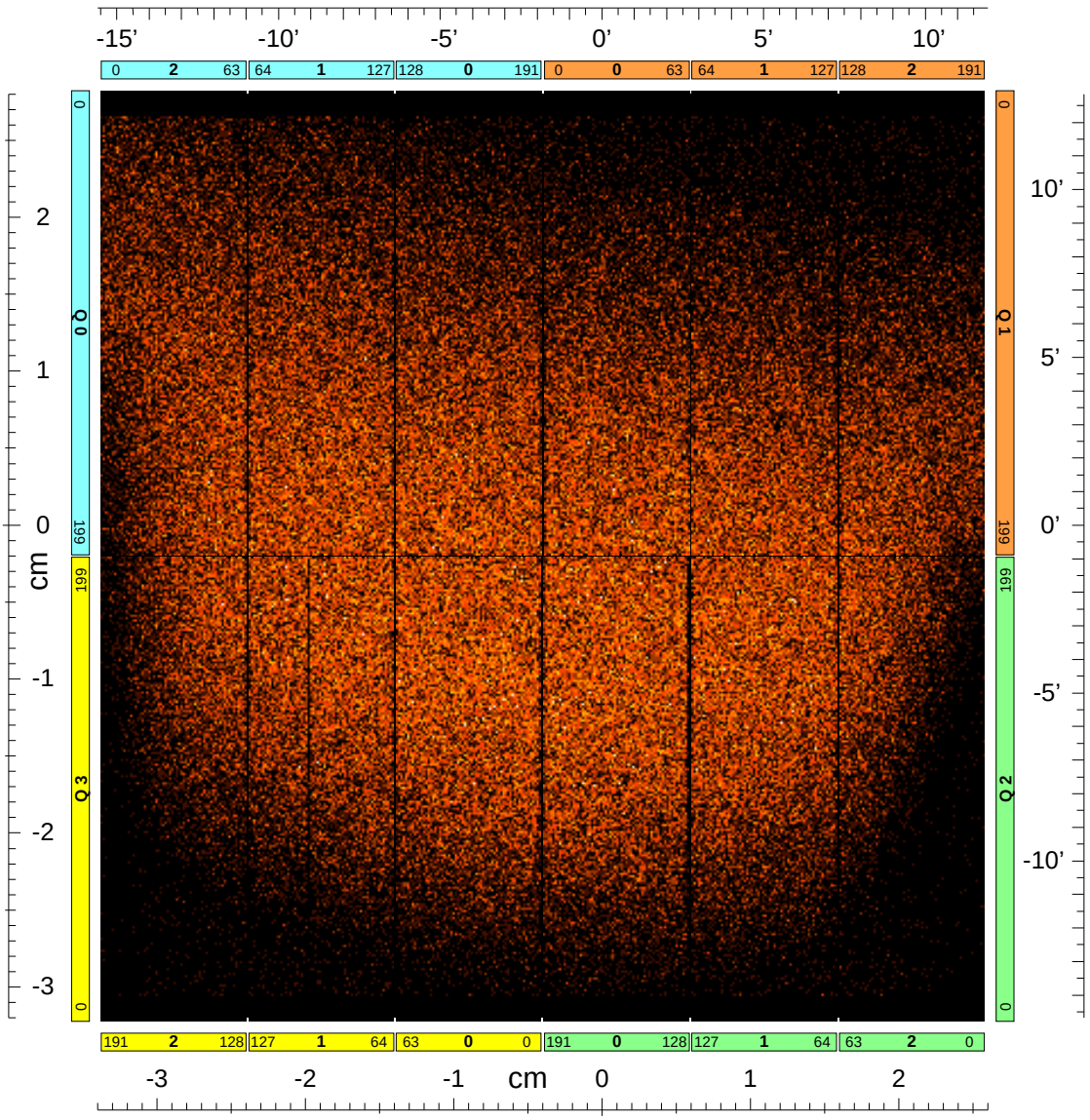
EPIC Calibration Operations Meeting

ESA Headquarters, Paris
February 7 – 8, 2001

Calibration EPIC pn:

CTI Monitoring

Gain Temperature Correlation

Single/Double Fraction (FF/SW)

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