XMM-Newton CCF Release Note

XMM-CCF-REL-123

Export of parameters from calpnalgo-2.38 to the EPN_CTI.CCF

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1 CCF components

Name of CCF	VALDATE	List of Blocks changed	CAL VERSION	XSCS flag
EPN_CTI_0009	2000-01-01T00:00:00	CTI-HIGH	not applicable	NO
EPN_CTI_0009	2000-01-01T00:00:00	CTI-HIGH_ADD_PAR	3.151	NO
EPN_CTI_0009	2000-01-01T00:00:00	CCD_OFFSETS	3.151	NO
EPN_CTI_0009	2000-01-01T00:00:00	TEMP_CTI	3.151	NO
EPN_CTI_0009	2000-01-01T00:00:00	ORSAY_GAIN	3.151	NO
EPN_CTI_0009	2000-01-01T00:00:00	LONG_TERM_CTI	3.151	NO
EPN_CTI_0009	2000-01-01T00:00:00	TIMING_GAIN	3.151	NO
EPN_CTI_0009	2000-01-01T00:00:00	BURST_GAIN	3.151	NO

2 Changes

Some parameters from calpnalgo-2.38 have been extracted to new extensions in the EPN_CTI_0009.CCF. This new CTI-CCF requires a change in the CAL. It can only be used with cal-3.146 and calpnalgo-2.39 and later. This interface change was completed with cal-3.151 and calpnalgo-2.41.

2.1 CTI-HIGH

The attribute **KEVPER_E = 3.72×10^{-3} [keV/e] keV per released electron** has been added to the header. It gives the necessary energy value to generate one electron.

2.2 CTI-HIGH_ADD_PAR

This new extension contains five vectors columns.

Y_SHIFT: This vector has only an entry for SW and LW mode correlated to the number of fast shifts to the read out node.

SCALE: This vector has only an entry for Timing mode. The value is used to adapt the Full Frame CTI-model to the Timing mode, related to the special read out in Timing Mode.

MODE_FACTOR: This vector has only an entry for SW and LW mode correlated to the special readout in those modes.

EFF_PAR: Parameters for special CTI-correction in the Extended Full Frame Mode

LWSW_PAR: Parameters for a fudge function to tune the CTI correction in Small Window and Large Window Mode.

2.3 CCD_OFFSETS:

Offsets for the Amplification of each CCD. (These parameters are currently not in use).

2.4 TEMP_CTI:

Parameters to account for possible temperature variations of the electronic boxes (These parameters are currently not in use).

2.5 ORSAY_GAIN:

Parameters to account for the different operational parameter during the Orsay ground calibration.

2.6 LONG_TERM_CTI:

Parameters to correct the long term effects, that are not modeled with the standard CTI-model.

2.7 TIMING_GAIN:

Parameters for a tuning function to take the different amplification in Full Frame and Timing mode into account.

2.8 BURST_GAIN:

Parameters for a tuning function to take the different amplification and CTI in Full Frame and Burst mode into account.

3 Scientific Impact of this Update

None.

4 Estimated Scientific Quality

5 Test procedures & results

5.1 Choose of two SAS versions

The new CCF was tested comparing the results using the following versions of SAS (releasetrack = RT, developmenttrack = DT):

```
RT = [xmmsas_20020807_1702-5.3.x-rt]
       epevents-8.32
       calpnalgo-2.36
       cal-3.138.4
       EPN_CTI_0008.CCF

DT = [xmmsas_20020812_1701]
       epevents-8.33   (only SAS-parameter-interface new related to DT)
       calpnalgo-2.39
       cal-3.148
       EPN_CTI_0009.CCF
```

5.2 Choose representative test datasets

The below datasets have been choosen for the test:

FF 0075_0124110101_PNS001 [Mkn 205] CCD 4 + CCD 12

eFF 0075_0124110101_PNS003 [Mkn 205] CCD 4 + CCD 12

LW 0075_0124110101_PNS002 [Mkn 205] CCD 4 + CCD 12

SW 0462_0155150101_PNS003 [AB Dor]

TI 0462_0155150101_PNS014 [AB Dor]

BU 0462_0155150101_PNS015 [AB Dor]

SW 0216_0098610201_PNS003 [4U 1624-49]

TI 0228_0111230101_PNS003 [X1822-371]

BU 0323_0136140301_PNS001 [XTE J1650-500]

5.3 Create CIF files according to the two SAS versions

CIF files for both SAS versions have been created:

RT : CCFPATH = willbepublic+public

DT : CCFPATH = devel+willbepublic+public

5.4 Create raw event files in RT

Raw event files have been created with epframes + badpixfind + badpix as input for epevents

5.5 Create event files in RT und DT

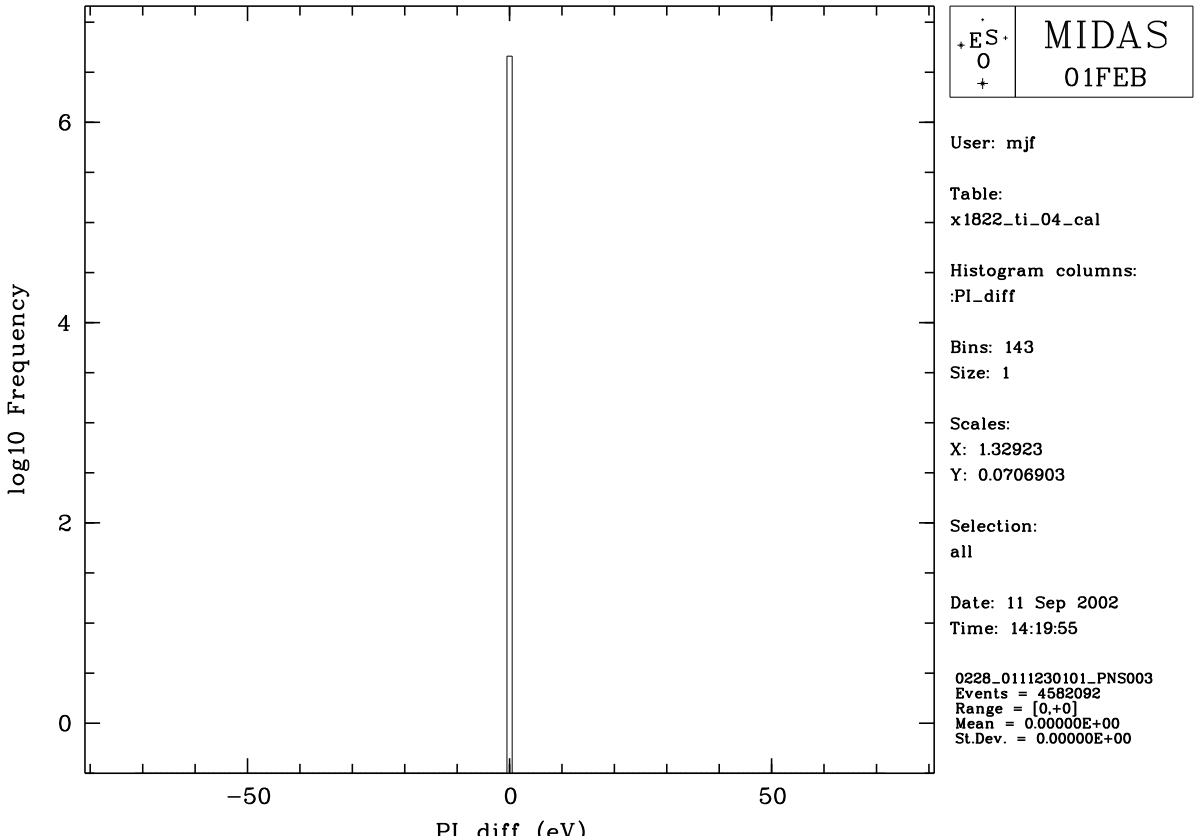
Event files have been created for the RT and DT with the correlated CCF using epevents

5.6 Comparison of results

The column of the corrected energies (PI) of the DT event files has been copied in the RT event file. After that the energy difference of both versions was compared for each event. The two energies turned out to be completely identical for all instrument modes: the histogram of the energy differences is a delta function at $\Delta E = 0\,\mathrm{eV}$. One such example (0228_0111230101_PNS003) is shown in the figure.

6 Expected Updates

No further update is expected.


log10 Frequency
6
4
2
0
−50
0
50
PI_diff (eV)
ESO
MIDAS
01FEB
User: mjf
Table:
x1822_ti_04_cal
Histogram columns:
:PI_diff
Bins: 143
Size: 1
Scales:
X: 1.32923
Y: 0.0706903
Selection:
all
Date: 11 Sep 2002
Time: 14:19:55
0228_0111230101_PNS003
Events = 4582092
Range = [0,+0]
Mean = 0.00000E+00
St.Dev. = 0.00000E+00