

# XMM-Newton CCF Release Note

XMM-CCF-REL-203

## Long term EPIC-pn CTI correction refinement

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### 1 CCF components

Name of CCF	VALDATE	List of Blocks changed	CAL VERSION	XSCS flag
EPN_CTL0015	2000-01-01T00:00:00	LONG_TERM_CTI	3.172.5	NO

### 2 Changes

The EPIC-pn Extended Full Frame (eFF) mode showed an overcorrection with time for the on-board calibration source at Mn energies. Corresponding parameters have been changed in the `EPN_CTL0015.CCF` in the extension `LONG_TERM_CTI`.

The long term CTI parameters for all other modes except for extended Full Frame mode stay the same as for Full Frame mode.

### 3 Scientific Impact of this Update

Line energy accuracy at Mn-K (Al-K) energies changes by up to 0.1 % for observations performed at in late 2005 in the Extended Full Frame mode.

The change is less strong at earlier times in the mission.

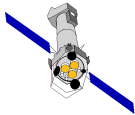


Table 1: Residual effects on data.

	FF Al-K	FF Mn-K	eFF Al-K	eFF Mn-K
residual slope old	0.0009	0.0001	0.0014	0.0008
residual slope new	0.0009	0.0001	0.0010	0.0000
effect at rev. 1000 old [%]	0.29	0.01	0.46	0.07
effect at rev. 1000 new [%]	0.29	0.01	0.35	0.00
effect at rev. 1000 old [eV]	5	1	7	4
effect at rev. 1000 new [eV]	5	1	5	< 1

## 4 Estimated Scientific Quality

Line position measurements will be more accurate for the Extended Full Frame mode through all the mission.

## 5 Test procedures & results

All available CALCLOSED data have been reprocessed with the `EPN_CTI_0014.CCF` and `EPN_CTI_0015.CCF` and Al and Mn line positions have been compared. Figure 1 shows the line positions of Al and Mn for CCD4 with `EPN_CTI_0014.CCF` and `EPN_CTI_0015.CCF`.

The residual time slope has been fitted with a linear fit. The slopes and the residual effect on data from revolution 1000 are shown in table 1.

## 6 Expected Updates

The long term CTI correction is currently the same for all modes but the Extended Full Frame mode. We may introduce mode specific long term CTI correction also for the other modes. CCF and software are prepared for that.

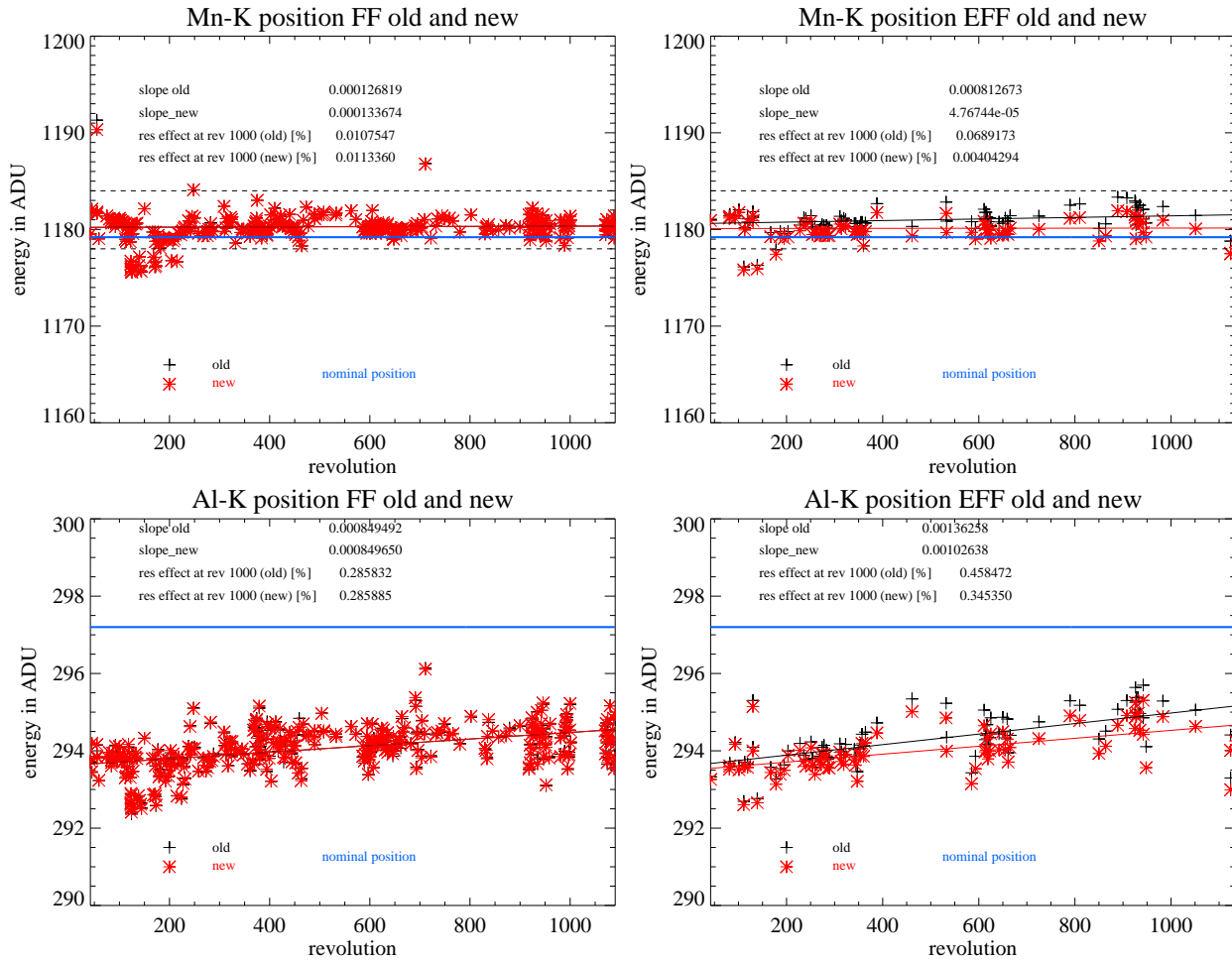
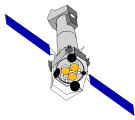


Figure 1: Line positions of the internal calibration source eFF (right) mode for Mn-K(alpha)(upper) and Al-K(lower). As a comparison the same plot is shown for FF (left). Black: EPN\_CTI\_0014.CCF, Red: EPN\_CTI\_0015.CCF. Note that for Al the line position is not yet at the nominal value after CTI correction only. This effect is taken into account in the detector response matrix with the Partial Event Effect, that is relatively stronger at low energies.