

XMM-Newton CCF Release Note

XMM-CCF-REL-128

New CTI correction for SW and LW Mode and new possible long term CTI 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_CTI0010	2000-01-01T00:00:00	CTI-HIGH_ADD_PAR	3.152	NO
EPN_CTI0010	2000-01-01T00:00:00	LONG_TERM_CTI	3.152	NO

2 Changes

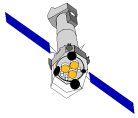
Some parameters from in CTI-HIGH_ADD_PAR have been changed. For the long term CTI correction parameters have been added to LONG_TERM_CTI in order to add to the linear long term CTI correction also a quadratic and cubic term. These parameters are currently set to 0. This means that the quadratic and cubic long term CTI correction is for the time being not enabled.

2.1 CTI-HIGH_ADD_PAR

The parameters LWSW_PAR(9:12) have been changed from 0 to a value. These parameters require calpnalgo-2.42.

2.2 LONG_TERM_CTI:

Parameters have been added in order to add to the linear long term CTI correction also an quadratic and cubic term for every mode. These parameters are currently set to 0. This means that the



quadratic and cubic long term CTI correction is for the time being not enabled.

A new attribute ALGOID has been added to identify algorithms.

3 Scientific Impact of this Update

The new CTI correction for SW and LW mode improves low energy CTI corrections, from 0.3 - 1.5 keV. This was achieved in combination with the new EPN_QUANTUMEF_0011.CCF.

4 Estimated Scientific Quality

With the new CTI and QE the residuals in the energy range from 0.3 - 1.5 keV decrease from 18 % to 10 % concerning the cross calibration MOS/pn. Fitting the pn without the MOSs, the residuals in the energy range from 0.3 - 1.5 keV decrease from 10 % to 5 %. The plots at the end of the document show examples.

5 Test procedures & results

The tests have been performed at the CAL workshop at MPE for the following data sets:

PKS2155 (0080940101, 0124930101, 0124930201, 0124930301, 0124930501),

PKS0558 (0129360201, 0125110101),

RXJ1856 (0106260101).

Also functional tests with the new CTI CCF have been performed at MPE and VILSPA.

6 Expected Updates

In order to change the long term CTI correction it is now possible to switch on an extra quadratic and/or cubic term (if this will be needed) by changing only the parameters of the CCF. No further changes in the SAS will be required.

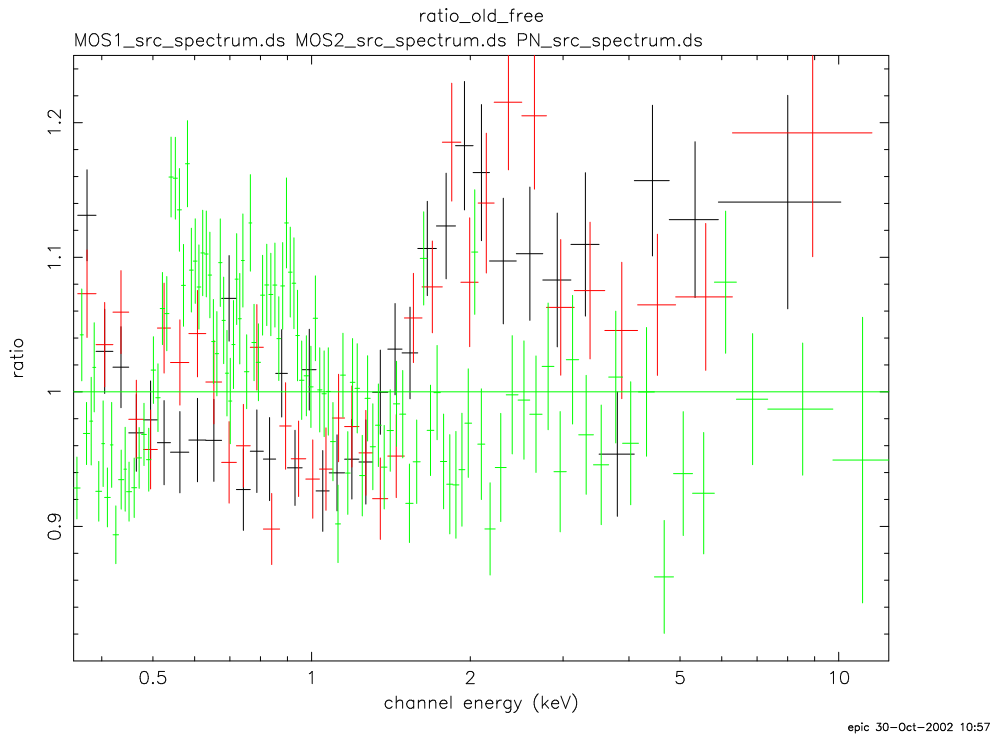
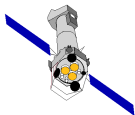


Figure 1: PKS0558 with old CTI correction and old QE. MOS1: black, MOS2: red, pn: green

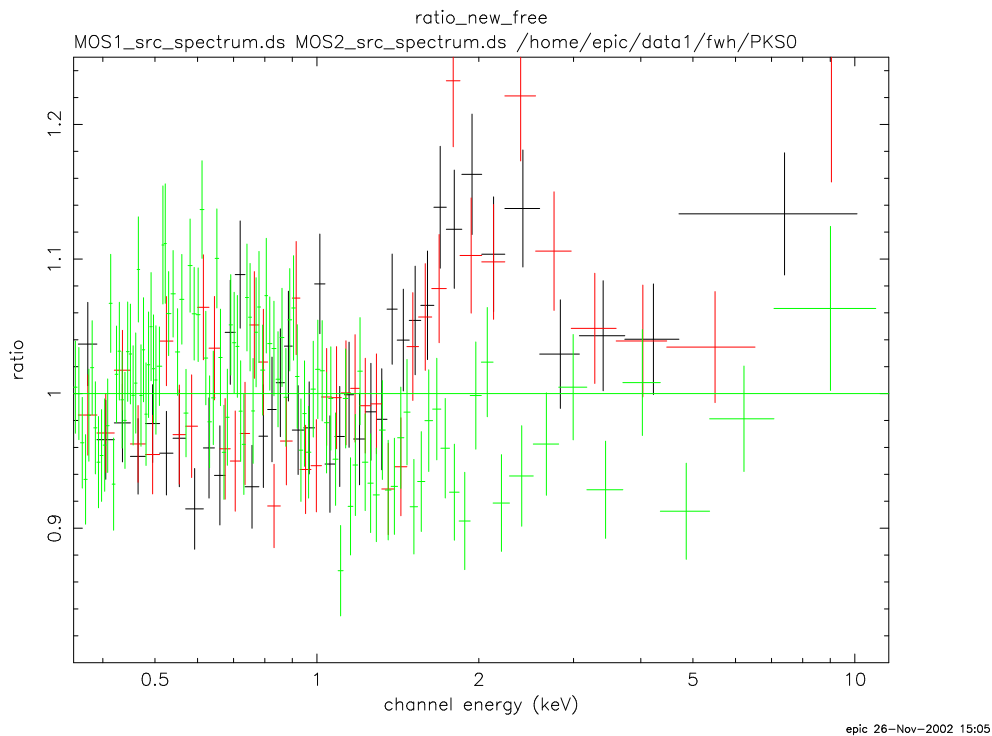
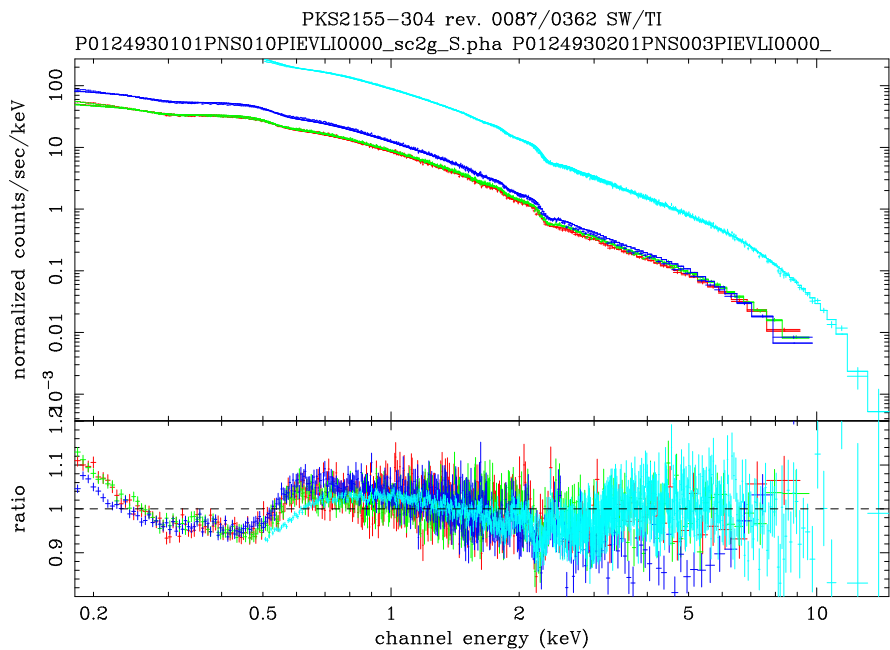
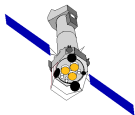
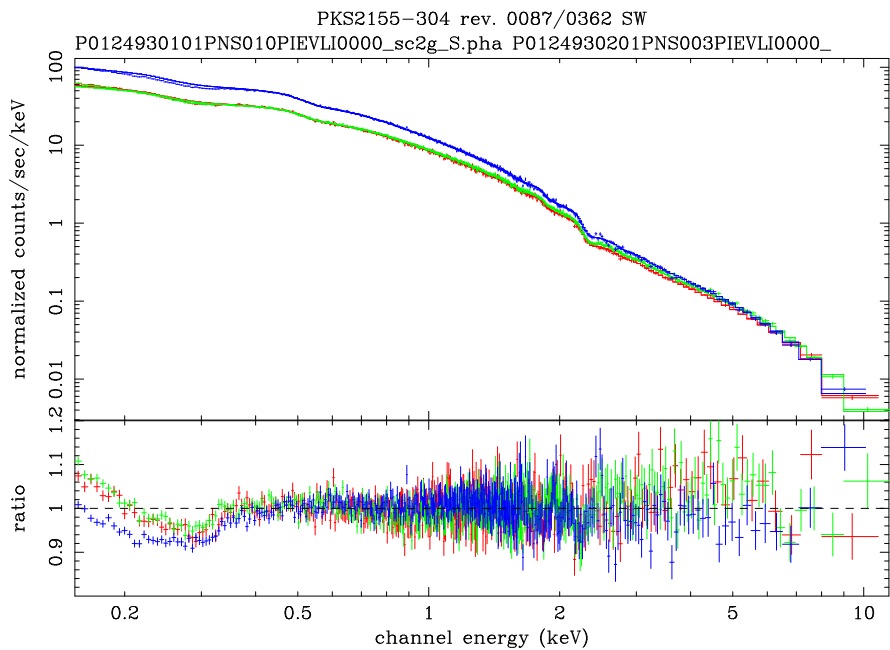


Figure 2: PKS0558 with new CTI correction and new QE. MOS1: black, MOS2: red, pn: green



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Figure 3: PKS2155 with old CTI correction and old QE. pn-SW rev. 87: red, green, pn-SW rev. 362: blue, pn-Timing-Mode: light blue



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Figure 4: PKS2155 with new CTI correction and new QE. pn-SW rev. 87: red, green, pn-SW rev. 362: blue. Note that the fit was only made above 0.3 keV. The low energy residuals are still under investigation.