XMM-Newton CCF Release Note

XMM-CCF-REL-212

Tuning RGS Instrumental MgF_2 Absorption with Mkn421

A.M.T. Pollock

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1 CCF components

Name of CCF	VALDATE	List of Blocks changed	XSCS flag
RGS1_EXAFS_0005	1999-01-01T00:00:00	MgF2-P-CCD1 MgF2-P-CCD2 MgF2-P-CCD3 MgF2-P-CCD4 MgF2-P-CCD5 MgF2-P-CCD6 MgF2-P-CCD7 MgF2-P-CCD8 MgF2-P-CCD9	NO
RGS2_EXAFS_0005	1999-01-01T00:00:00	MgF2-P-CCD1 MgF2-P-CCD2 MgF2-P-CCD3 MgF2-P-CCD4 MgF2-P-CCD5 MgF2-P-CCD6 MgF2-P-CCD7 MgF2-P-CCD8 MgF2-P-CCD9	NO

2 Changes

This release improves the description of the weak instrumental absorbtion feature near 17.9Å due to MgF_2 in the RGS CCDs by exploiting the high statistics of the roughly 1 million seconds accumulated on the bright smooth continuum of blazar Mkn421 throughout the mission between revs 0084 and 1084. The previous release was described in XMM-SOC-CAL-SRN-0171

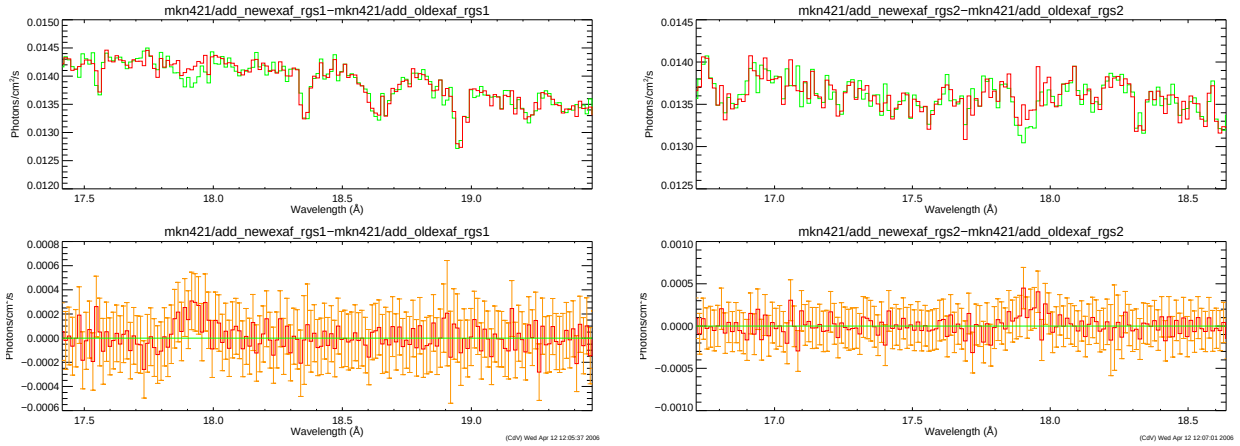

Figure 1: Details of first-order spectra of RGS1 (right) and RGS2 (left) of Mkn421 accumulated throughout the mission in order to maximise statistics. The upper panels show the spectra calculated with the new release in red and the previous release in green, while the lower panels show the difference.

3 Scientific Impact of this Update

Reduced risk of confusing an instrumental feature with absorption in the intergalactic medium, for example.

4 Estimated Scientific Quality

Systematic flux uncertainties near the Flourine edge reduced to about 2%.

5 Test procedures & results

The equivalent width of the instrumental Fluorine feature is quite low and thus not easy to see in single observations of even strong sources. Fig. 1 shows RGS 1st-order accumulated mean spectra of Mkn421 calculated with the old and new EXAFS CCFs. The instrumental absorbtion feature near 17.9Å due to MgF_2 has been reduced in the new release to a level consistent with the general noise level.

6 Expected Updates

With the routine accumulation of calibration data on Mkn421, it should be possible to review. the instrumental absorption data every few years.