

## XMM-Newton CCF Release Note

## XMM-CCF-REL-273

**EPIC MOS response**

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24 March 2011

**1 CCF components**

Name of CCF	VALDATE	EVALDATE	Blocks changed	XSCS flag
EMOSn_REDIST_0093.CCF	1999-12-10	2000-10-03	CCD_REDISTRIBUTION-n	NO
EMOSn_REDIST_0094.CCF	2000-10-03	2001-04-22	CCD_REDISTRIBUTION-n	NO
EMOSn_REDIST_0095.CCF	2001-04-22	2001-11-07	CCD_REDISTRIBUTION-n	NO
EMOSn_REDIST_0096.CCF	2001-11-07	2002-05-26	CCD_REDISTRIBUTION-n	NO
EMOSn_REDIST_0097.CCF	2002-05-26	2002-11-05	CCD_REDISTRIBUTION-n	NO
EMOSn_REDIST_0098.CCF	2002-11-05	2004-01-14	CCD_REDISTRIBUTION-n	NO
EMOSn_REDIST_0099.CCF	2004-01-14	2005-02-14	CCD_REDISTRIBUTION-n	NO
EMOSn_REDIST_0100.CCF	2005-02-14	2006-03-22	CCD_REDISTRIBUTION-n	NO
EMOSn_REDIST_0101.CCF	2006-03-22	2007-04-24	CCD_REDISTRIBUTION-n	NO
EMOSn_REDIST_0102.CCF	2007-04-24	2008-05-28	CCD_REDISTRIBUTION-n	NO
EMOSn_REDIST_0103.CCF	2008-05-28	2009-07-01	CCD_REDISTRIBUTION-n	NO
EMOSn_REDIST_0104.CCF	2009-07-01	2010-08-03	CCD_REDISTRIBUTION-n	NO
EMOSn_REDIST_0105.CCF	2010-08-03	NONE	CCD_REDISTRIBUTION-n	NO

Where the  $n$  refers to the MOS-1 and MOS-2 cameras in  $EMOSn$  and to the 7 CCDs of each camera in  $CCD\_REDISTRIBUTION-n$ .

**2 Changes**

This is a small change which affects the normalisation of the silicon fluorescence function in all of the CCF elements. The normalisation value has been reduced from 0.015 to 0.003.

**3 Scientific Impact of this Update**

This change leads to a better modelling of the instrumental silicon feature. In figure 1 it can be seen that, with the previous set of CCFs, the silicon fluorescence line was being over-modelled, resulting in negative residuals in spectral fits. This has now been resolved.

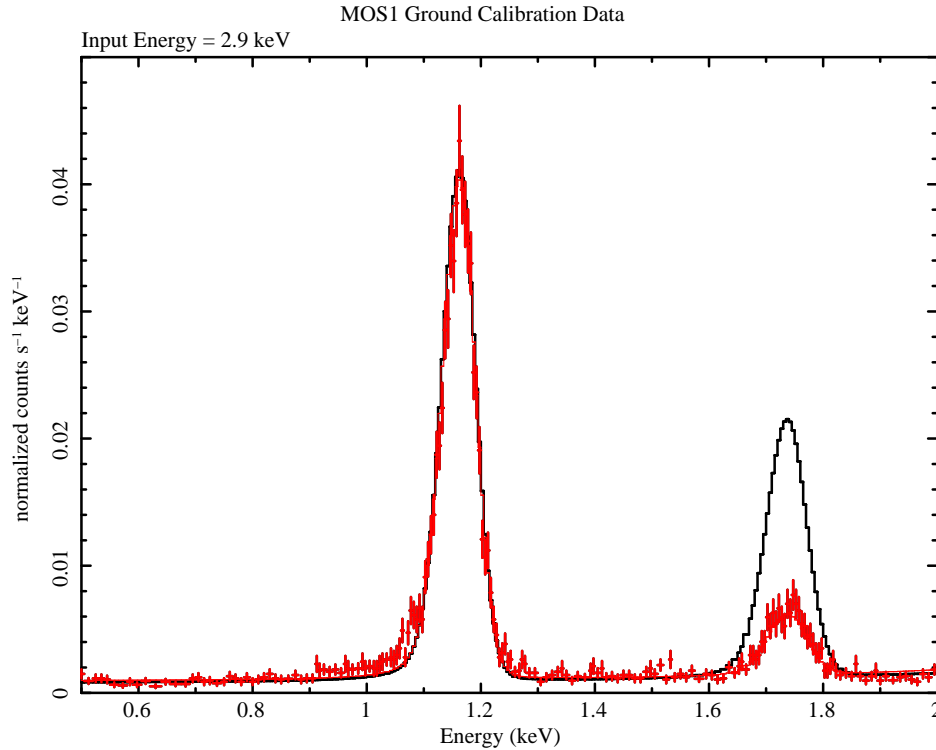
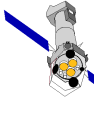


Figure 1: Ground calibration data for MOS1, CCD1 showing the relative strengths of the Si Fluorescence line at 1.74 keV to the Si Escape line at 1.16 keV ( $=2.90-1.74$  keV) for an input energy of 2.9 keV. The strength of the Si fluorescence feature within the model RMF was set incorrectly as can be seen by the black curve. The red curve shows the corrected model.

In figures 2 and 3 the practical improvement that can be expected, due to this change, in a bright continuum source is shown for both cameras.

## 4 Estimated Scientific Quality

The weak Silicon fluorescence feature will now be modelled in the response matrix to an accuracy of  $\sim 5\%$ .

## 5 Test procedures and results

Response matrices have been generated for on-axis sources for a range of dates, for both of the MOS cameras. The residuals between 1.5 and 2.0 keV have been investigated and found to be improved in all fits.

## 6 References

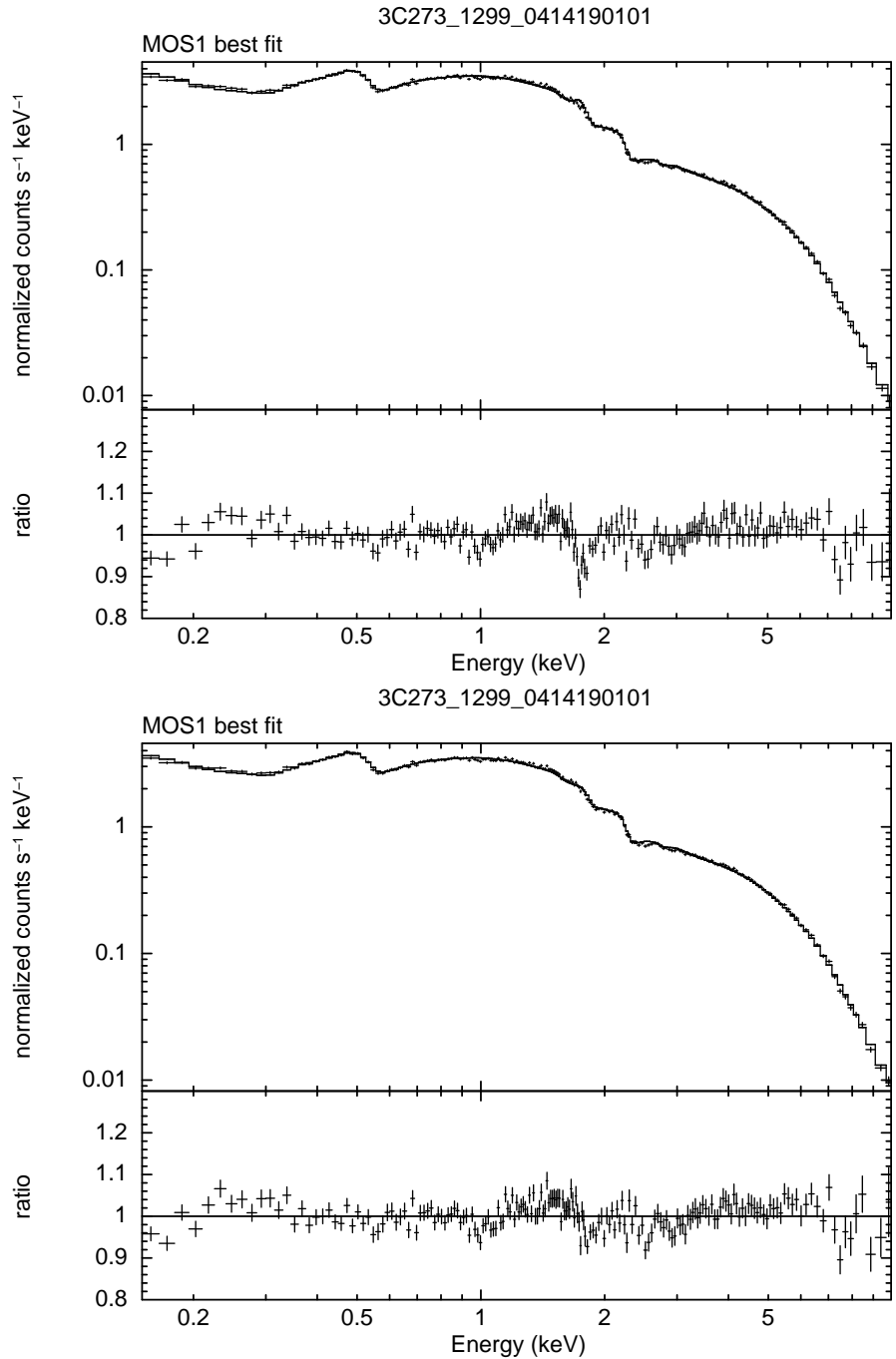
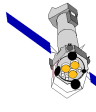


Figure 2: A comparison of the residuals generated by the best fitting model to the MOS-1 observation 0414190101 of 3C273. The top panel uses the old Si Fluorescence line normalisation and the lower panel uses the new value. A noticeable improvement is visible around 1.8 keV.

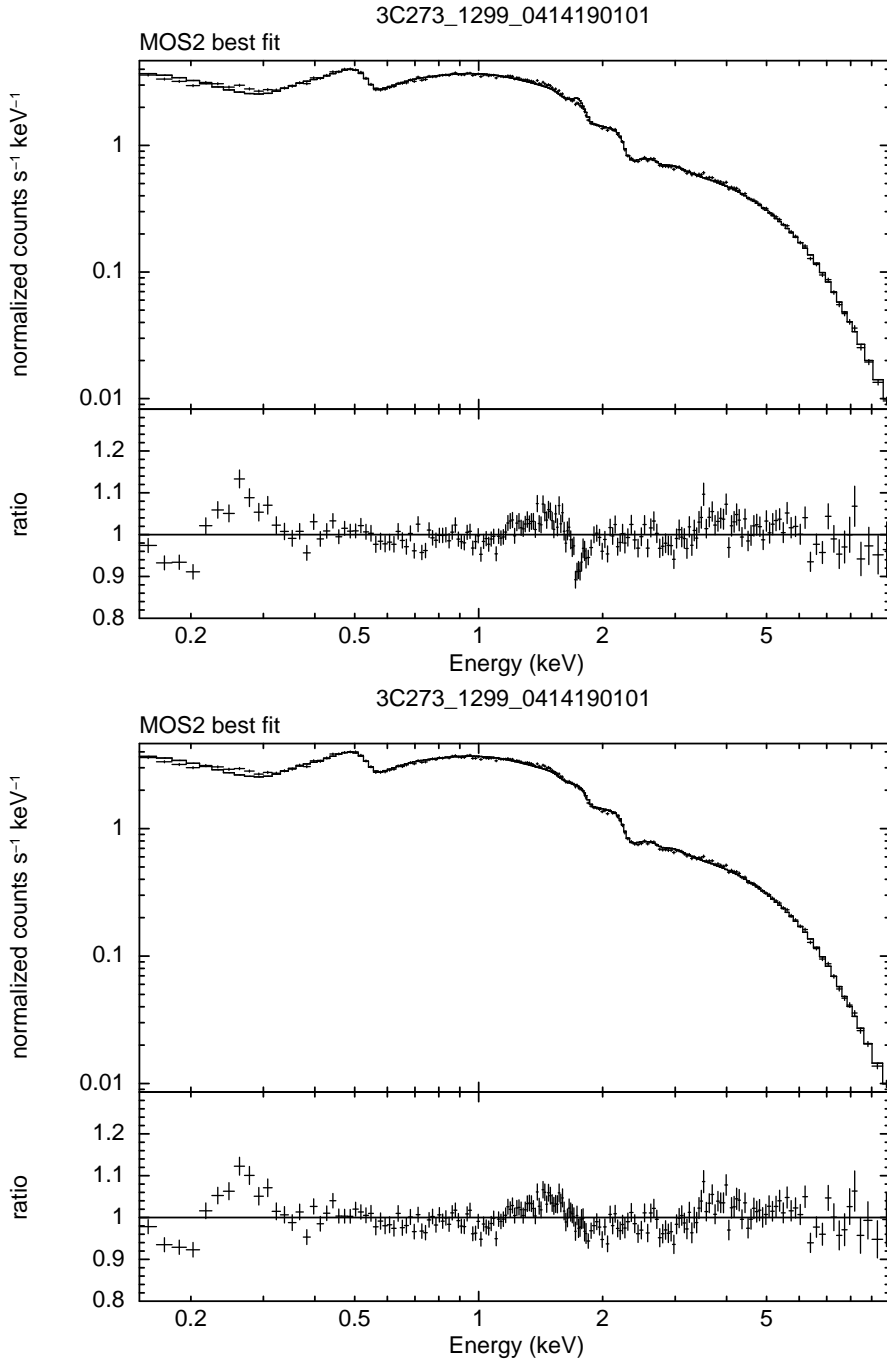
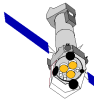


Figure 3: A comparison of the residuals generated by the best fitting model to the MOS-2 observation 0414190101 of 3C273. The top panel uses the old Si Fluorescence line normalisation and the lower panel uses the new value. A major improvement is visible around 1.8 keV.