

## XMM-CCF-REL-113

**EPIC Spectral Response Distribution**

R. D. Saxton

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**1 CCF components**

Name of CCF	VALDATE	List of Blocks changed	CAL VERSION	XSCS flag
EMOS1_REDIST_0012.CCF	2000-01-01	CCD_REDISTRIBUTION-n		NO
EMOS2_REDIST_0012.CCF	2000-01-01	CCD_REDISTRIBUTION-n		NO
EPN_REDIST_0007.CCF	2000-01-01	EBINS		NO

**2 Changes**

The MOS files have been updated with the redistribution functions from LUX. These are *rmf\_110\_v7.2.dat* for MOS-1 and *rmf\_110\_v7.3.dat* for MOS-2. The predominant changes are to the shape of the low-energy redistribution function for single-pixel events and to the low-energy tail for bi-pixel events.

The number of energies in the PN file has been increased to 1319. This is reflected in the current batch of canned PN matrices produced by MPE.

**3 Scientific Impact of this Update**

The changes allow the MOS low-energy response to be modelled more accurately than before. The increased number of energy bins allow line features to be modelled more accurately in PN spectra.

**4 Estimated Scientific Quality**

See [1] and [2].

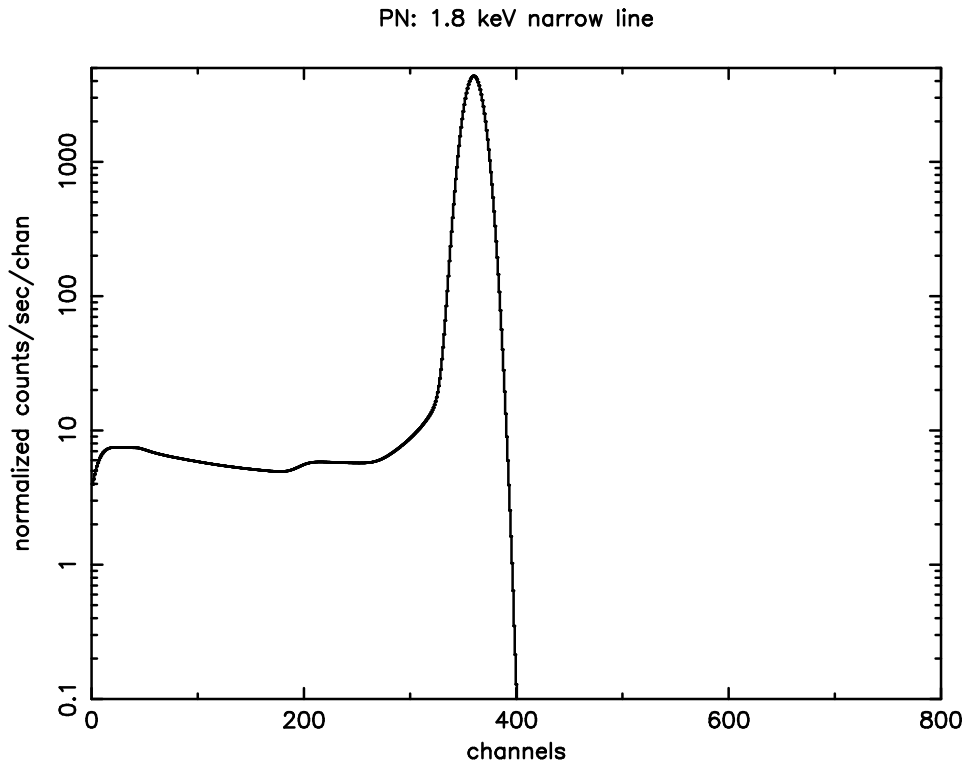


Figure 1: Comparison of PN canned response function v SAS equivalent for a 1.8 keV narrow line.

## 5 Expected Updates

The MOS redistribution files are likely to change again as the calibration improves.

## 6 Test procedures

The changes introduced here are only used within `rmfgen`. They are designed to allow the SAS to produce RMFs which are equivalent to the LUX and MPE canned matrices. Tests will check that they are as similar as possible.

## 7 Test results

The difference between the MOS and PN standard responses and the SAS responses generated using these new CCF elements are shown in Figures 1–3. The PN and MOS-1 responses are duplicated perfectly. The SAS response for MOS-2 shows a small excess in the blue wing of the curve which is probably due to different thresholding criteria.

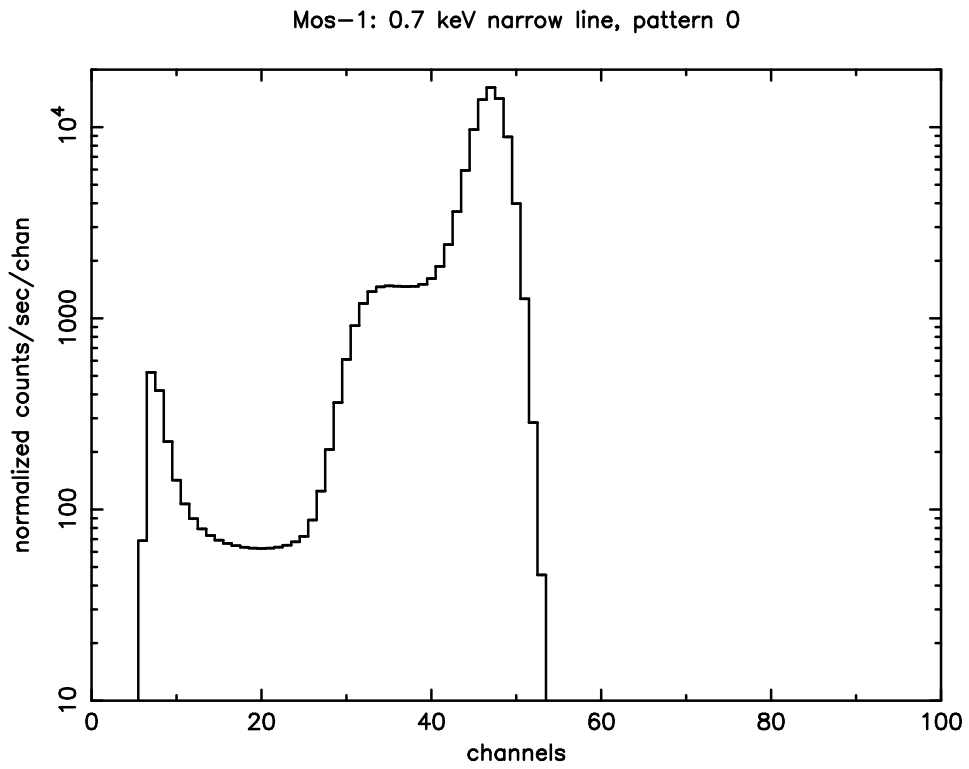


Figure 2: Comparison of MOS-1 canned response function v SAS equivalent for a 0.7 keV line using pattern 0.

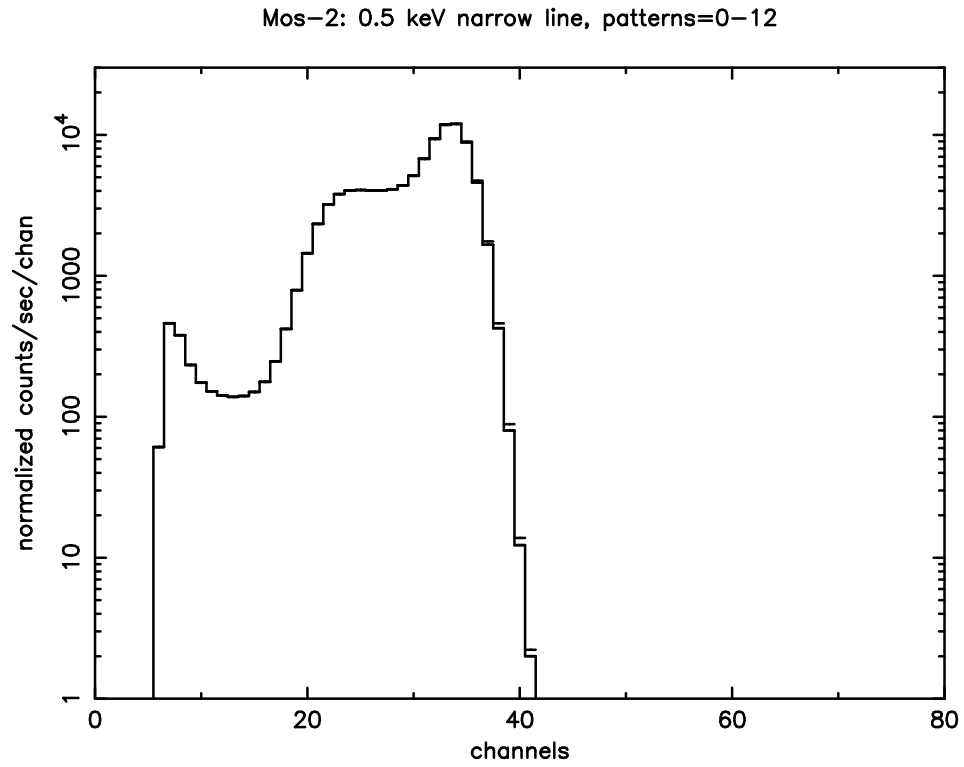


Figure 3: Comparison of MOS-2 canned response function v SAS equivalent for a 0.5 keV line using patterns 0-12

## References

- [1] Sembay S. et al., "Performance and Calibration of the EPIC-MOS Cameras on XMM-Newton", Proceedings of the symposium 'New visions of the X-ray Universe in the XMM-Newton and Chandra era', 26-30 November 2001, ESTEC, The Netherlands. *in press*.
- [2] Haberl, F., Briel, U.G., Dennerl, K. and Zavlin, V.E., "Spectral response of the EIC-PN detector: Basic dependencies", Proceedings of the symposium 'New visions of the X-ray Universe in the XMM-Newton and Chandra era'. 26-30 November 2001, ESTEC, The Netherlands. *in press*.