XMM-Newton CCF Release Note

XMM-CCF-REL-73

EPIC Spectral Response Distribution

D Lumb

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1 CCF components

| Name of CCF	VALDATE	List of Blocks changed	CAL VERSION	XSCS flag
EPN_REDIST_0006.CCF	2000-01-01	BINNEDPI_EBOUNDS EBINS		NO
EMOS1_REDIST_0010.CCF	2000-01-01	BINNEDPI_EBOUNDS		NO
EMOS2_REDIST_0010.CCF	2000-01-01	BINNEDPI_EBOUNDS		NO

2 Changes

These changes have been made to support the release of the $rmfgen$ task for SAS v5.0.3. For the PN modified the different tables to be coherent with gain calibration in response to SAS SPR [972] "CAL_getRedistribution and CAL_gainCorrect are incoherent". The BINNEDPI_EBOUNDS now contains what the EBOUNDS extension used to contain. The EBINS extension contains now the PN RMF 972 row values Frank Haberl (MPE) supplied for the fixed response matrices. Previously this contained 4096 values which made $rmfgen$ task run 4 times more slowly.

The MOS BINNEDPI_EBOUNDS was also modified so that the channel bins can be used for future updates expected from Leicester University.

3 Scientific Impact of this Update

The data that have been changed in this release only affect the bin digitisation which is used in the $rmfgen$ task which mainly affects speed and not scientific quality.
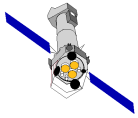
TheEBOUNDS extension is identical with the number of rows in the RMF supplied by the instrument team (eg. 972 channels, whose spacing is designed to be non-linear so that the response distribution which changes more rapidly at lower energies is better sampled

Extension PHA_EBOUNDS defines the approximate PHA-energy relationship for quick-look plotting purposes and the like - available to the SAS tasks through the CAL routine CAL_getEbounds(). eBounds(i).lo - eBounds(i).hi corresponds to the energy bin for PHA channel i. In the EPIC case the PHA channel is defined as the conversion from multiple energy info into a single energy value for an event

Extension BINNEDPI_EBOUNDS defines the (binned) PI-energy relationship (the PI-energy relationship is trivially PI=eV), i.e., this is the first axis of the RMF in terms of real (gain/CTI corrected) input energies. Currently we have this as equally spaced 5eVbins so that it slightly oversamples the energy resolution scale of the detectors

Extension EBINS defines the second axis of the RMF in terms of real output energy bins i.e. what is observed from the detector - available to the tasks through the CAL routine CAL_getEbins()

4   Estimated Scientific Quality

The *arfgen* and *rmfgen* tasks should now produce comparable quality to the fixed responses supplied until now by the instrument teams.

5   Expected Updates

Future changes are expected to be real improvements in the physical data representing improved knowledge of the instrument