

# XMM-Newton CCF Release Note

XMM-CCF-REL-54

## EPIC Energy Scale

D Lumb

December 7, 2000

### 1 CCF components

| Name of CCF        | VALDATE             | List of Blocks changed | CAL VERSION | XSCS flag |
|--------------------|---------------------|------------------------|-------------|-----------|
| EMOS1_ADUCONV_0010 | 2000-01-01T00:00:00 | OFFSET_GAIN            |             | NO        |
| EMOS2_ADUCONV_0010 | 2000-01-01T00:00:00 | OFFSET_GAIN            |             | NO        |

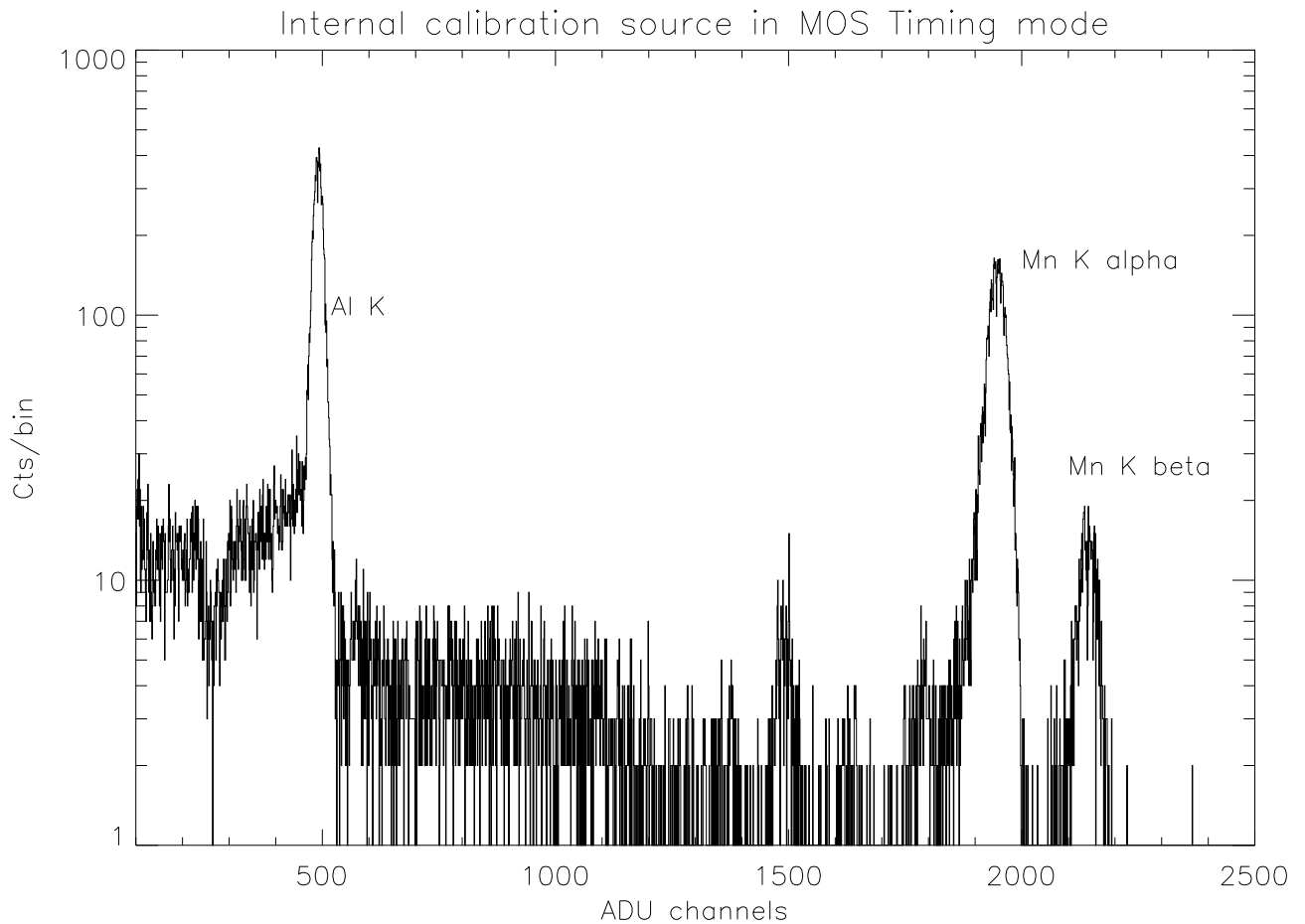
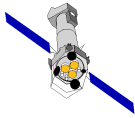
### 2 Changes

The User Help Desk reported a bug in the previous conversion. Figure 1 Shows the measured internal calibration source data for the timing mode. The 3 major emission lines have been fit with a quadratic which should go through zero. To a good approximation we have a simple linear gain term, which is significantly different than the nominal gain. Leicester University report a 10% difference in sampling period between TIMING mode and normal image mode.

Due to the current limitation of the mode dependency of gain, we can only apply a “fudge factor” to cover the linear component in TIMING mode. According to the fit of Figure 2, this is actually 8.8% different than the nominal gain.

### 3 Scientific Impact of this Update

Modifies the gain for the FAST mode of EPIC MOS



## 4 Estimated Scientific Quality

Without a correction sources will appear red-shifted by 10. With this simple correction applied, and knowing the discrepancy in ACTUAL clock sequence usage, we expect the correction of the error to be within 1 - 2% of the ACTUAL gain. That is 60eV at Fe K lines, and 10-20 eV where photon spectra peak.

It should further be noted that TIMING mode performs an on-chip binning of pixels and the resulting change in distribution of split charge will inevitably affect the response distribution in an as yet undetermined way.

## 5 Expected Updates

