XMM-Newton CCF Release Note

XMM-CCF-REL-88

RGS Line Spread Function – New Scatter Parameters

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1 CCF components

| Name of CCF	VALDATE	List of Blocks changed	CAL VERSION	XSCS flag
RGS1_LINESPREADFUNC_0004	1999-01-01T00:00:00	LASCAT	xmmsas_20010329_1900	NO
RGS2_LINESPREADFUNC_0004	1999-01-01T00:00:00	LASCAT	xmmsas_20010329_1900	NO

2 Changes

The parameters of the r.m.s. surface roughness as a function of wavelength was changes according to the values in [1].

3 Scientific Impact of this Update

The cross-dispersion LSF had an additional level of scattered light, which caused an underestimation of the inter-order scattered light by the response see [1, Figure 3]. This light is distributed in the PI versus BETA plot between the orders, at constant BETA (mimicking an insufficient calibration of the response of the CCD).

This effect was included in the response as from `rgsrmfgen 0.45.3`. Therefore a modification of the large angle scattering parameters was necessary.
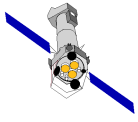
4   Estimated Scientific Quality

The impact of this change on the effective area is only a few percent. But depending on the spectrum of the source, additional flux across orders occurs for harder spectra, which previously resulted in a net underestimate of the modeled counts, due to enhanced 'bleeding' of the higher orders into low order spectra.

Hence improvements of the spectral modeling are dependent of the spectrum of the source in question. See [1] for a detailed description of the effect of the change.

References

[1] John Peterson Jean Cottam.   *The Cross-Dispersion Distribution of the Large-Angle Scattered Light.*   RGS-COL-CAL-01004,   Columbia   University,   2001. http://xmm.astro.columbia.edu/cal_files/cal01004.ps.