

XMM-Newton CCF Release Note

XMM-CCF-REL-359

OM Grisms Calibration: time dependent sensitivity correction

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1 CCF components

Name of CCF	VALDATE	EVALDATE	List of Blocks changed	XSCS flag
OM_GRISMAL_0005	2000-01-01T00:00:00	—	TDS_CORR	NO

2 Changes

2.1 Time dependent sensitivity degradation correction

The sensitivity of the Optical Monitor (OM) on board XMM-Newton is affected by a time dependent degradation. This is due to two main effects: the degradation of the S-20 photocathode and the aging of the MCP. The first of these effects is known to be wavelength dependent

This time dependent degradation is described for the colour filters (V, B, U, UVW1, UVM2, UVW2) in XMM-SOC-CAL-TN-0207, where a correction factor is defined and computed. The corresponding description and correction for the OM grisms can be found in XMM-SOC-CAL-TN-0218.

2.2 The correction

A new extension has been added to the OM_GRISMAL CCF containing the correction for the time dependent sensitivity degradation of both OM grisms.

The correction factor is given in Table 1 as a function of the year of observation. Fluxes obtained by SAS will be multiplied by this factor. The correction factor will be stored in the FITS keyword **TDS_CORR**.

Table 1: Correction factors for OM grisms time dependent degradation.

Year	UV_Grism	V_Grism
2000	1.00	1.00
2002	1.01	1.01
2004	1.02	1.02
2006	1.04	1.02
2008	1.05	1.03
2010	1.07	1.04
2012	1.08	1.04
2014	1.10	1.05
2016	1.12	1.06
2018	1.13	1.07
2020	1.15	1.07

3 Scientific Impact of this Update

This correction will allow users to compare the fluxes of any source observed with the OM grisms at different epochs.

4 Estimated Scientific Quality

Absolute fluxes obtained with the OM grisms will be more accurate with this new correction.

5 Expected Updates

The table of correction factors covers the period since launch till year 2020. An update will be necessary for observations obtained after this date.

6 Test procedures

The correction has been tested in observations of the OM standard stars Hz 2, GD 153, and BPM 16274 obtained at different epochs and processed with SAS **omfchain** using **omgrism** v1.27 (no correction) and v1.28 (with the correction).

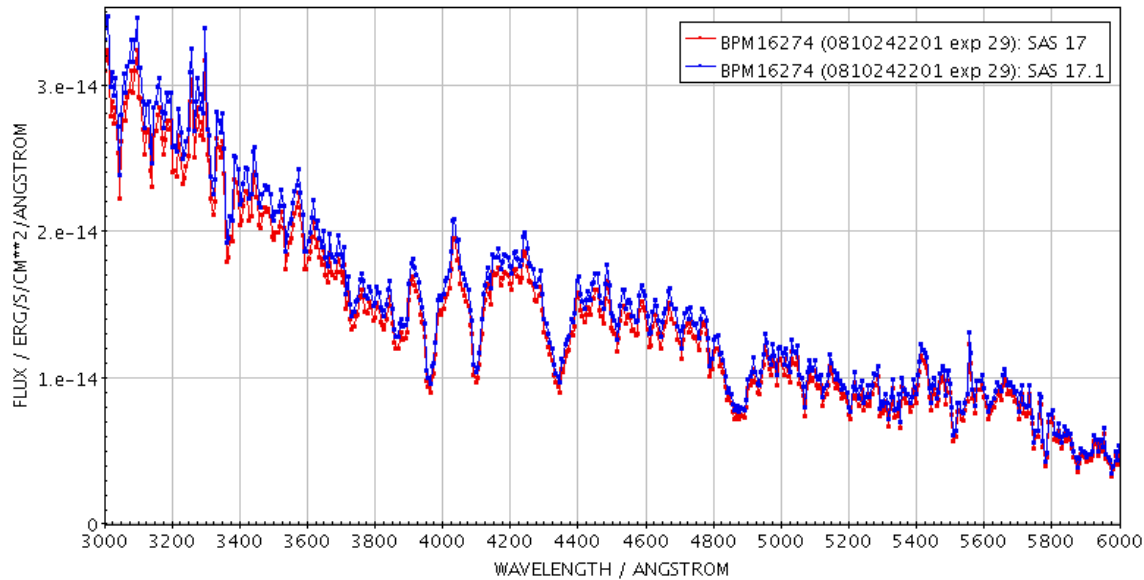


Figure 1: Corrected (blue) and uncorrected (red) spectra of the white dwarf BPM 16274 observed in 2018, with TDS_CORR=1.07.

7 Summary of the test results

Fluxed spectra corrected and not corrected have been divided to check that the correction factor is the one given by the keyword **TDS_CORR**, whose value has been checked against the contents of Table 1.

We can see in Figure 1 the visible grism spectrum of BPM 16274 observed on 2018-11-03. The corresponding correction factor included as FITS keyword TDS_CORR is 1.07 in agreement with Table 1.

References