XMM-Newton Calibration Updates

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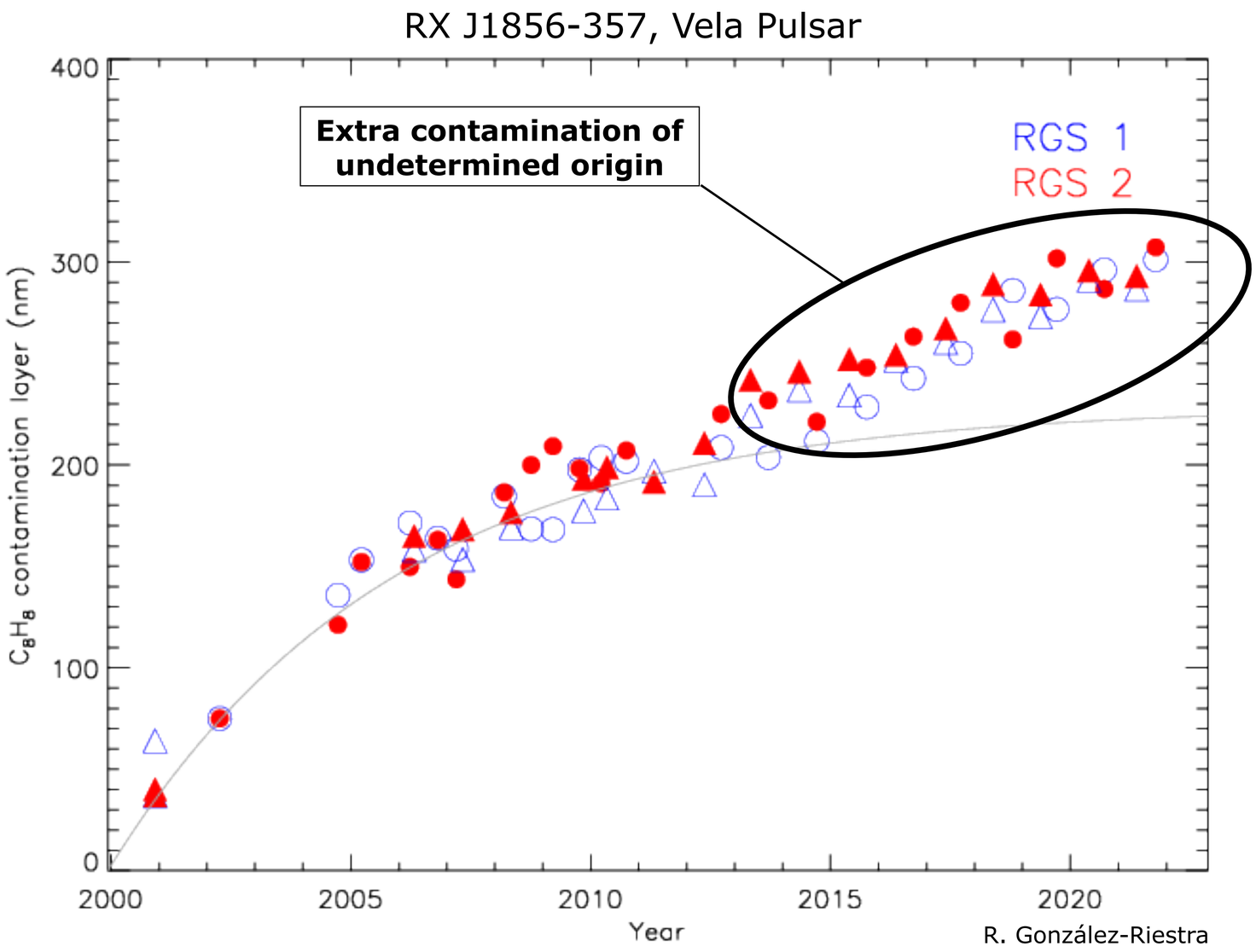
IACHEC on-line meeting 23 May 2022

XMM calibration releases over 2021/22

		XMM-CCF-REL-	
Astrometry:	time variable boresight updates	380, 387	
RGS:	bad pixels, gain, CTI	381, 383, 385	
EPIC:	effective area correction (EPIC-MOS - EPIC-pn)	382	
	effective area correction (EPIC-pn - NuSTAR)	388	(see talk by Felix Fuerst)
	EPIC-pn energy scale	389	(see talk by Ivan Valtchanov)
OM:	grism time dependent sensitivity	386	

RGS: contamination



Contamination estimated from the flux of RX J1856-357 at long wavelengths.

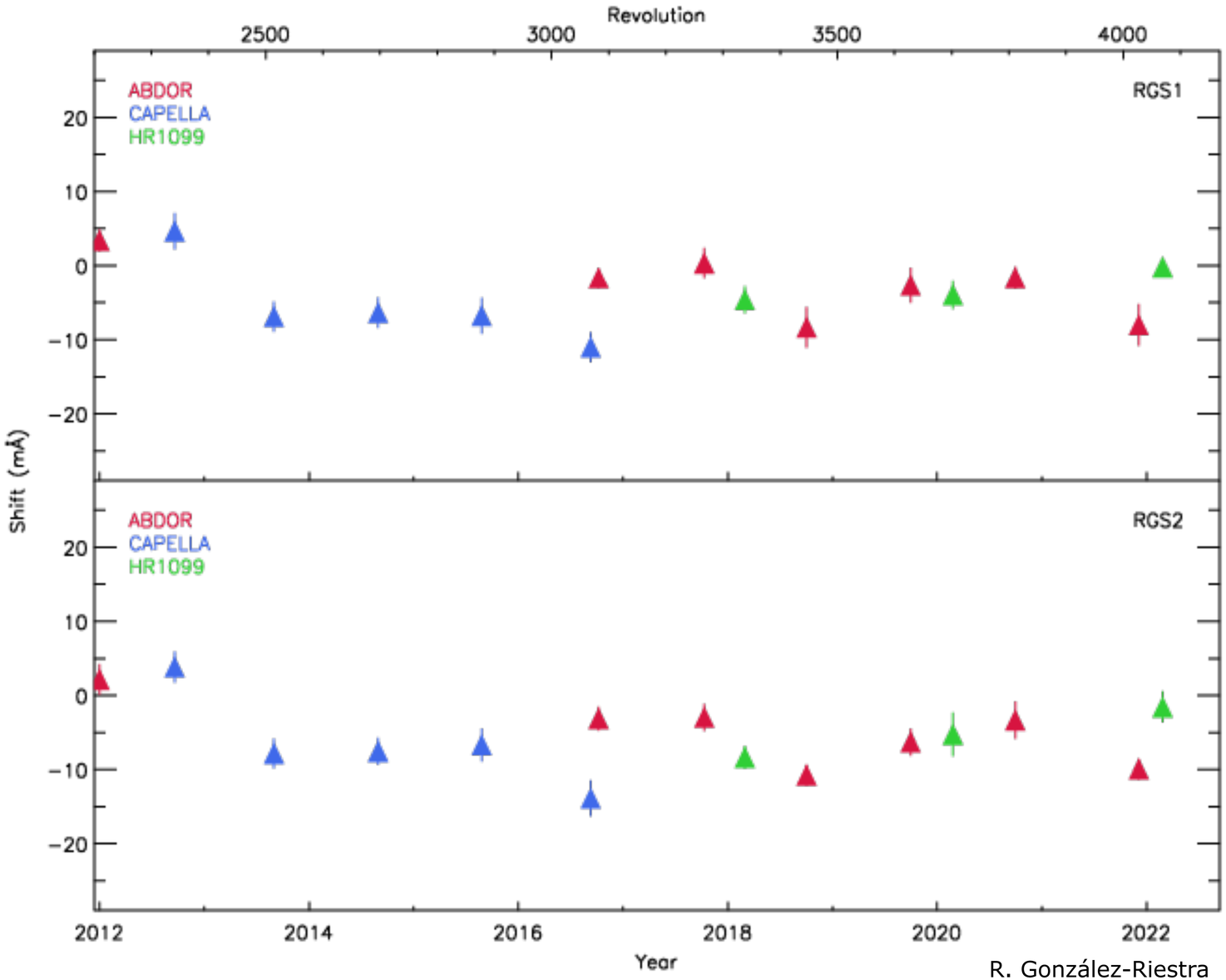
Observed flux decrease not explained by C_8H_8 contamination.

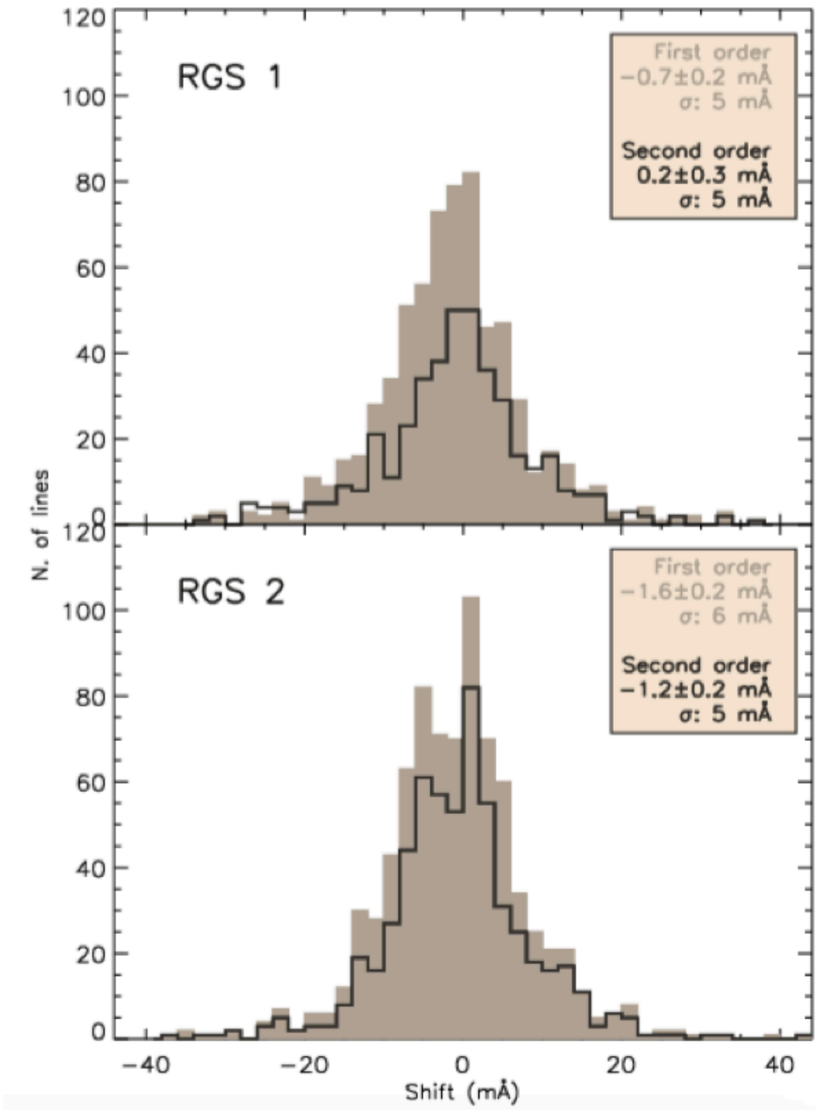
Empirical corrections in place.

Work ongoing to understand reason of Aeff loss.

RGS: wavelength scale

AB Dor, Capella, HR 1099:





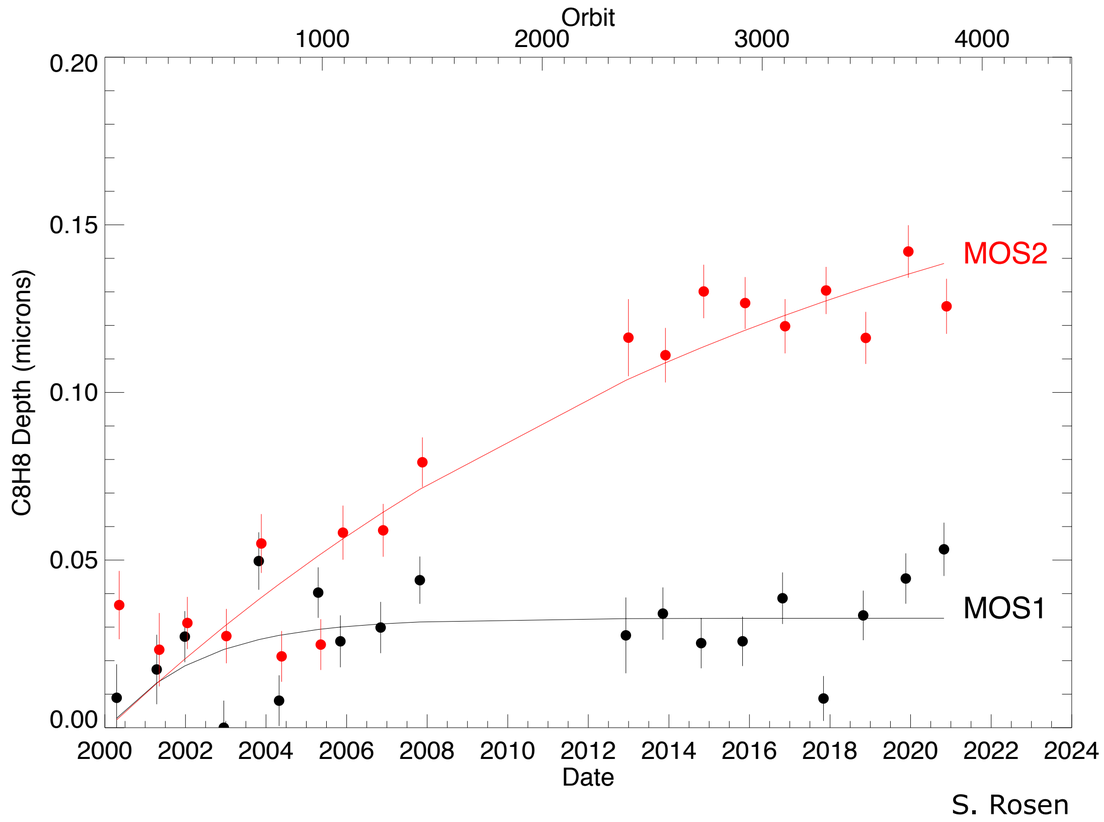
R. González-Riestra

EPIC: effective area

MOS

Build up of contaminant, esp. MOS2

Based on 1E 0102.2-7219

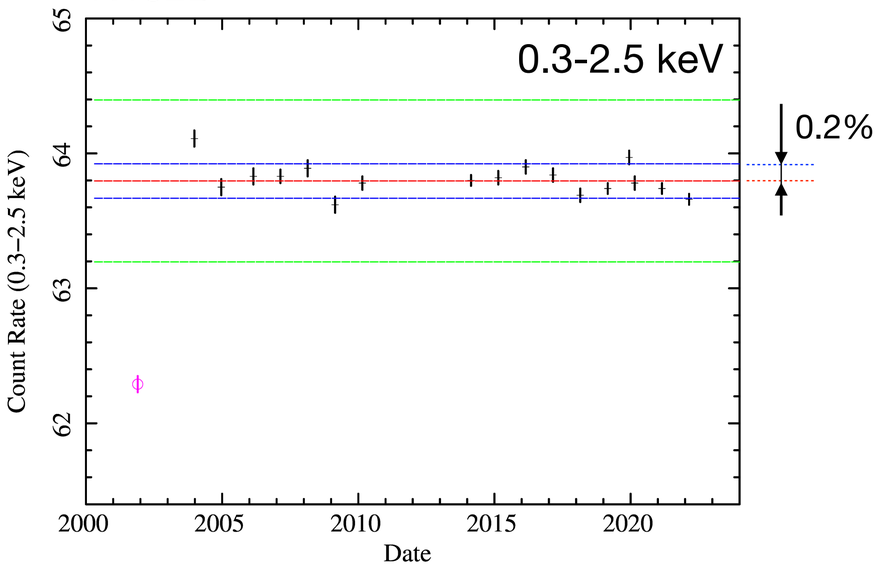


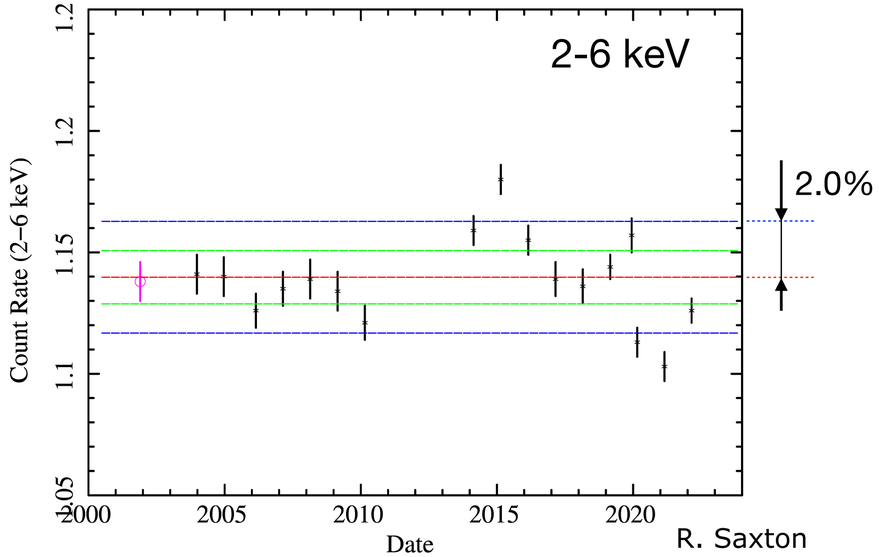
S. Rosen

PN

Very stable

N132D





R. Saxton

EPIC: updated A_{eff} correction

Recalibration of the CORRAREA correction: an empirical correction of MOS A_{eff} to PN

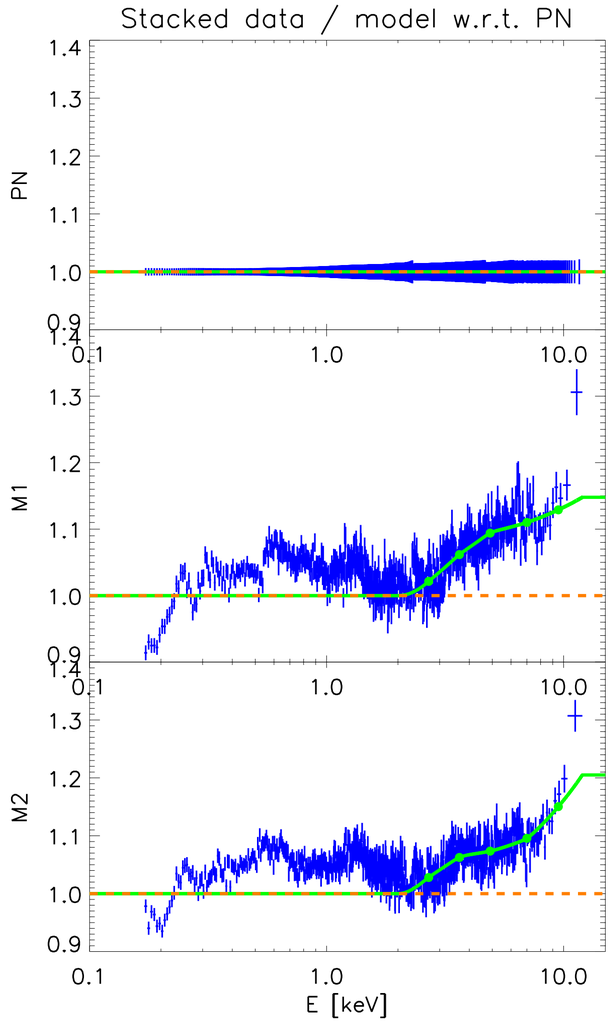
Sample of ~ 120 sources:
- On-axis, point source, non-piled up

Per observation:
- Derive best-fit PN model
- Apply PN model to MOS1 & MOS2

Per instrument, stack
- Data
- Model (= expected cts + scaled bkg)

Determine stacked data / model ratios and normalise to PN

Derive energy-dependent A_{eff} correction function (spline) to minimise residuals:
- correction to MOS A_{eff} > 2.0 keV
- null correction < 2.0 keV (where redistribution effects may be significant)



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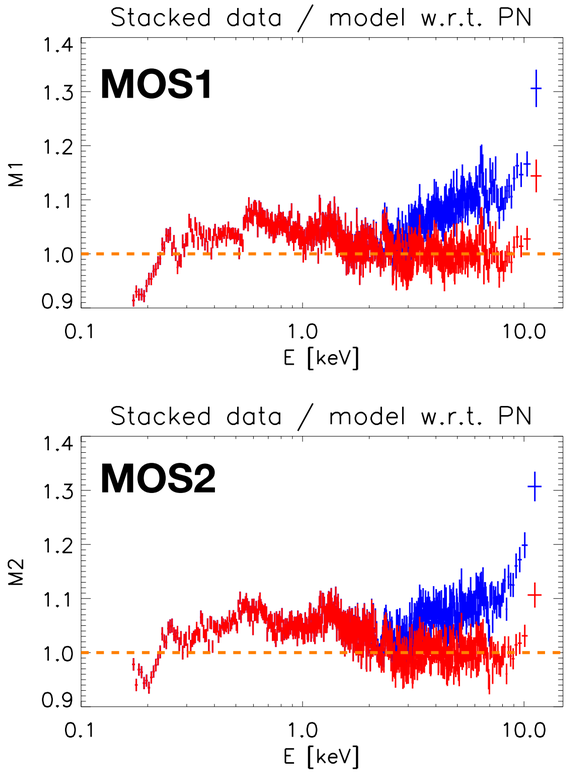
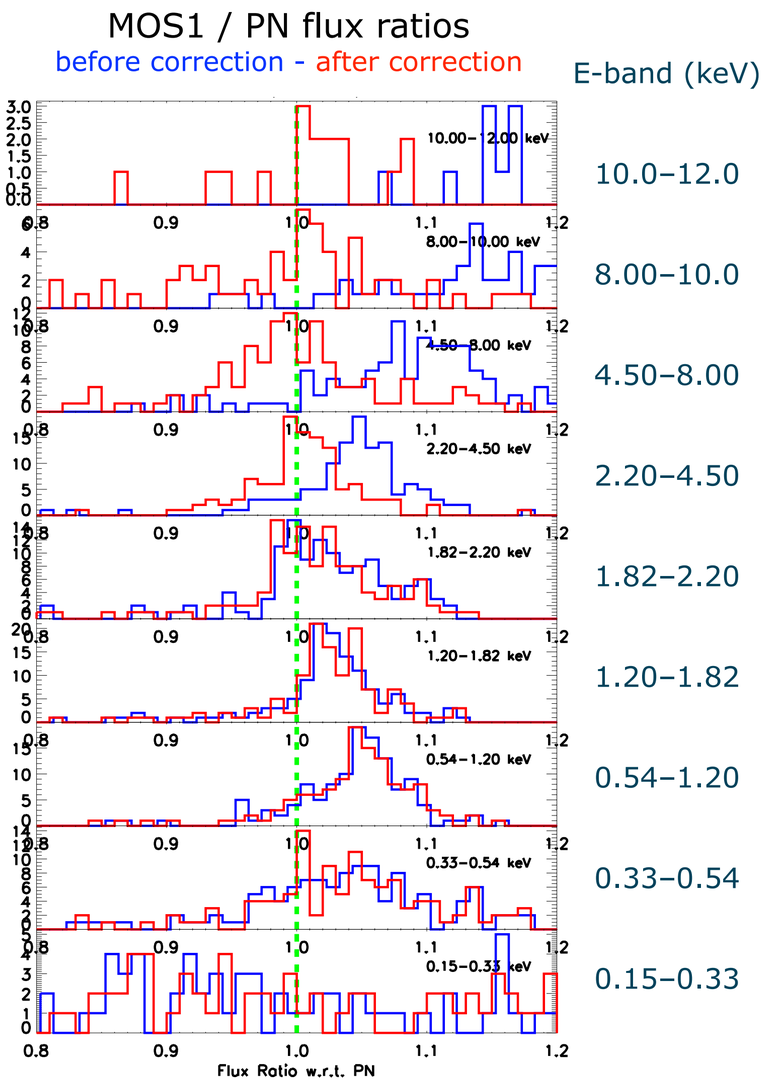
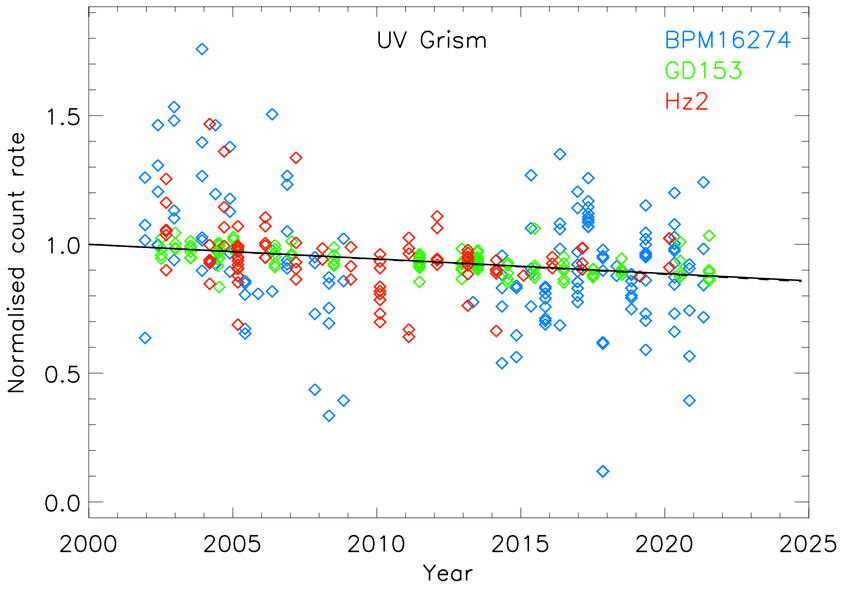
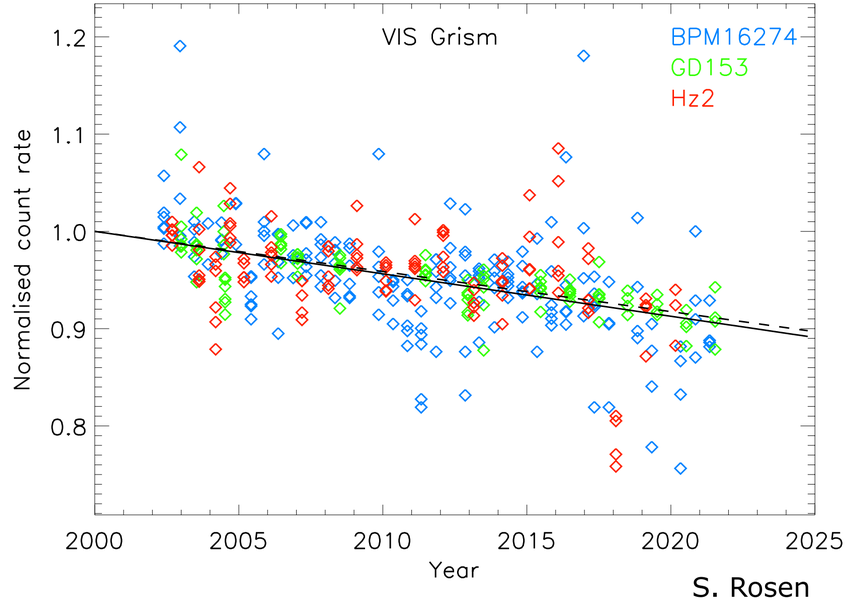




OM: grism time-dependent degradation





S. Rosen

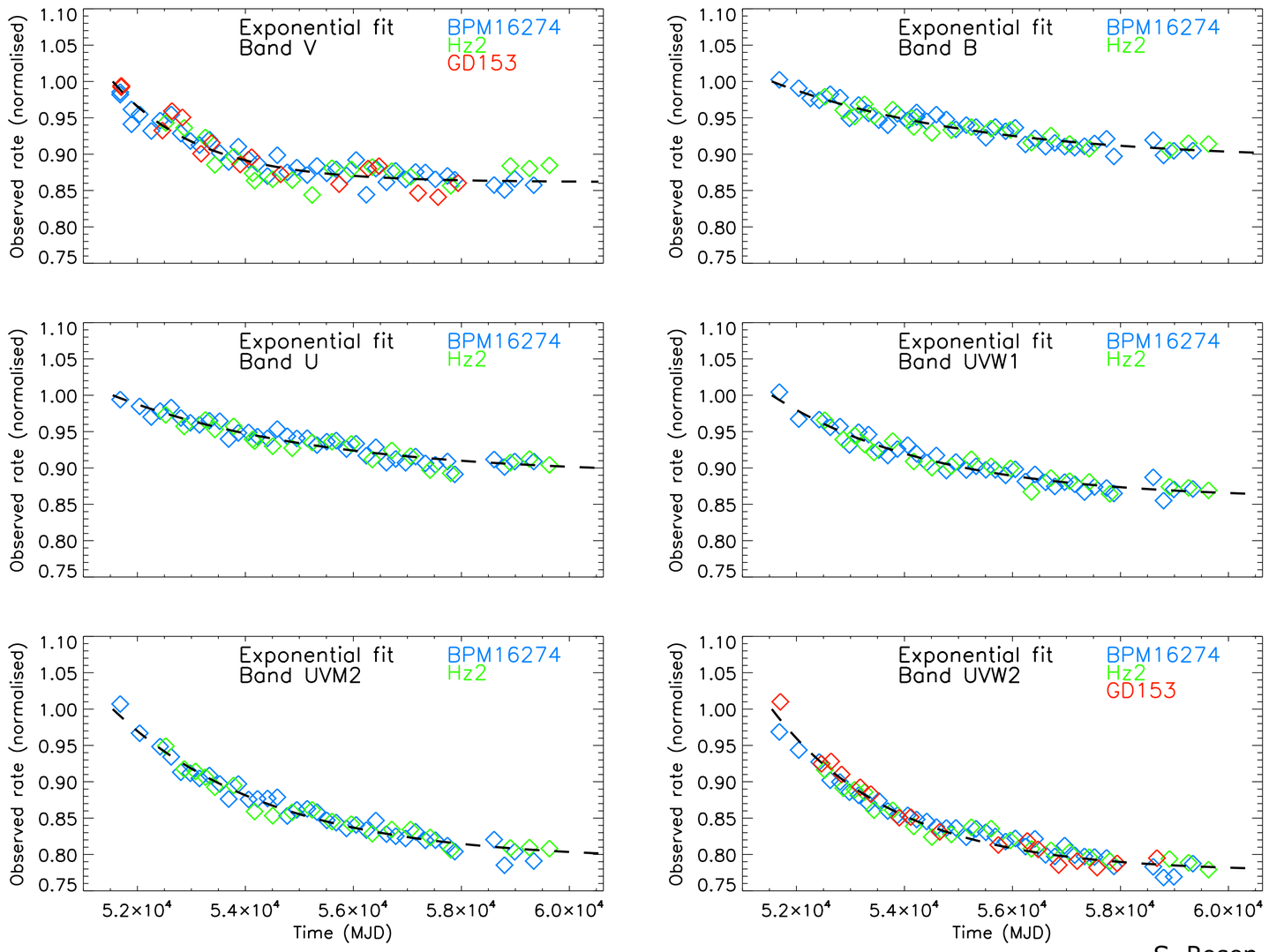
Measurements of spectra of 3 standard stars in 6 wavelength bands in each grism.

OM grism throughput in 2024.0

Grism	Throughput
UV	0.86
VIS	0.90

Decline of sensitivity corrected in SAS; calibration updated to 2024 in (XMM-CCF-REL-386 released 03/12/21)

OM: monitoring time-dependent degradation (filters)



S. Rosen

OM throughput at 2030

Filter	Throughput
V	0.86
B	0.89
U	0.89
UVW1	0.86
UVM2	0.81
UVW2	0.78

Declines continue to slow in all filters.

Degradation is corrected in SAS.