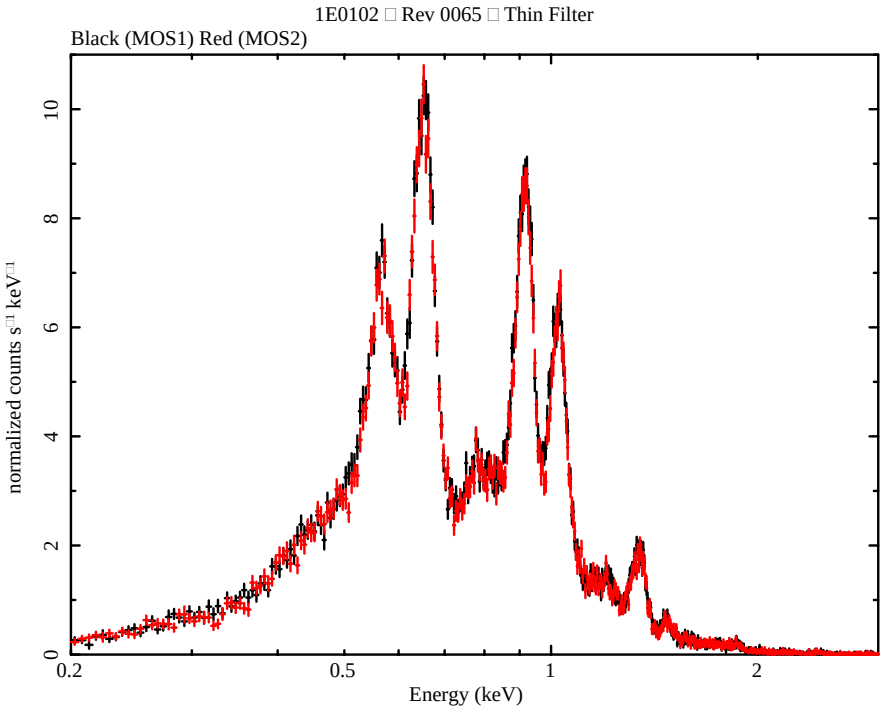
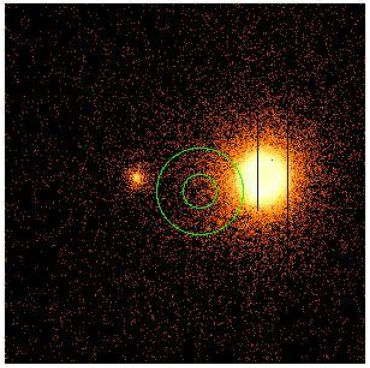
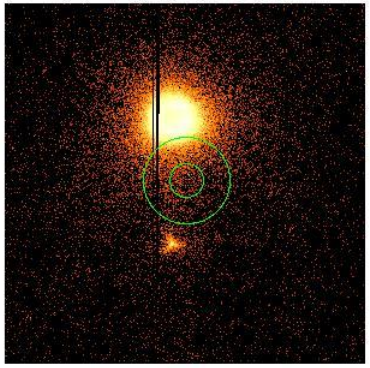
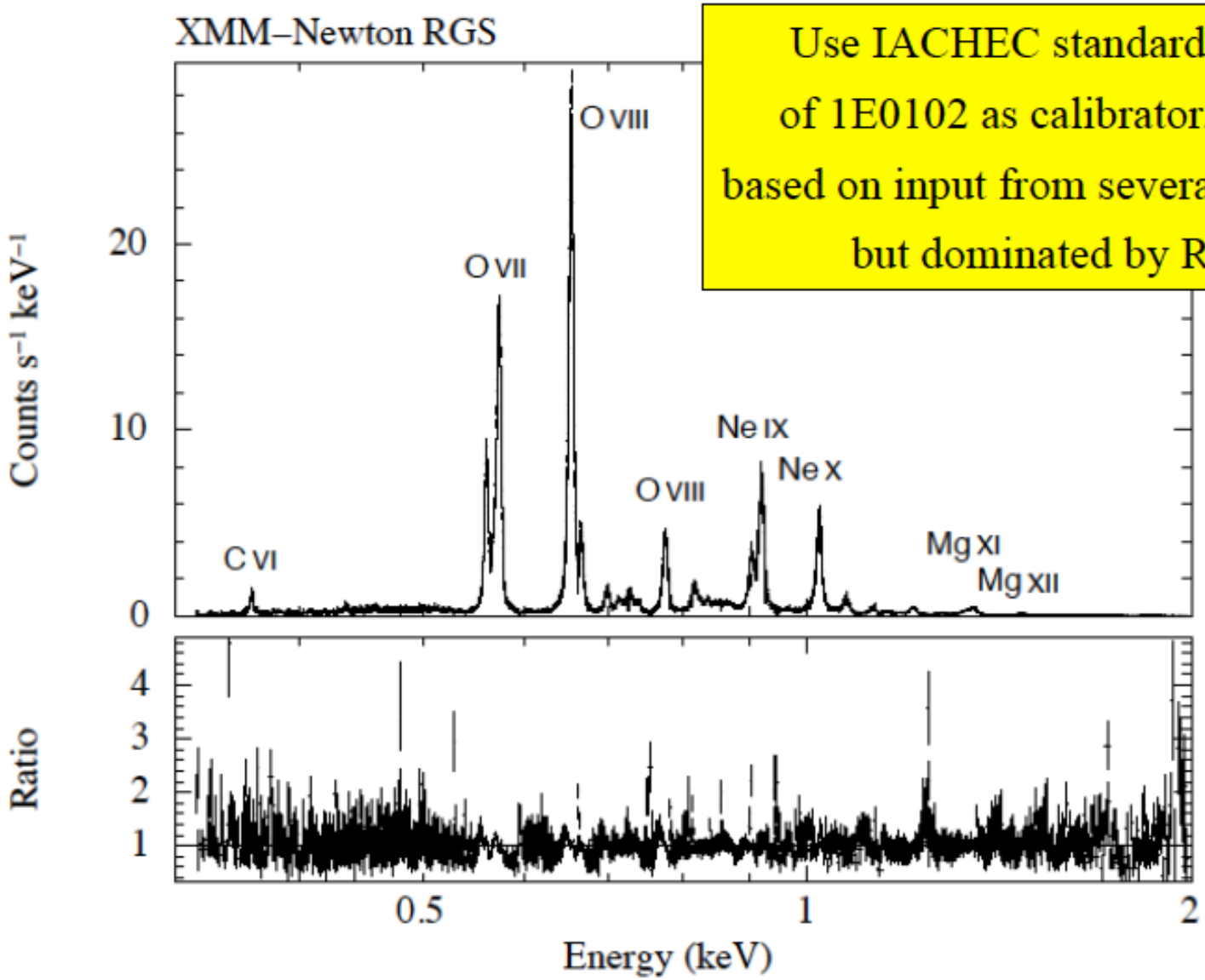
EPIC-MOS Contamination Monitoring







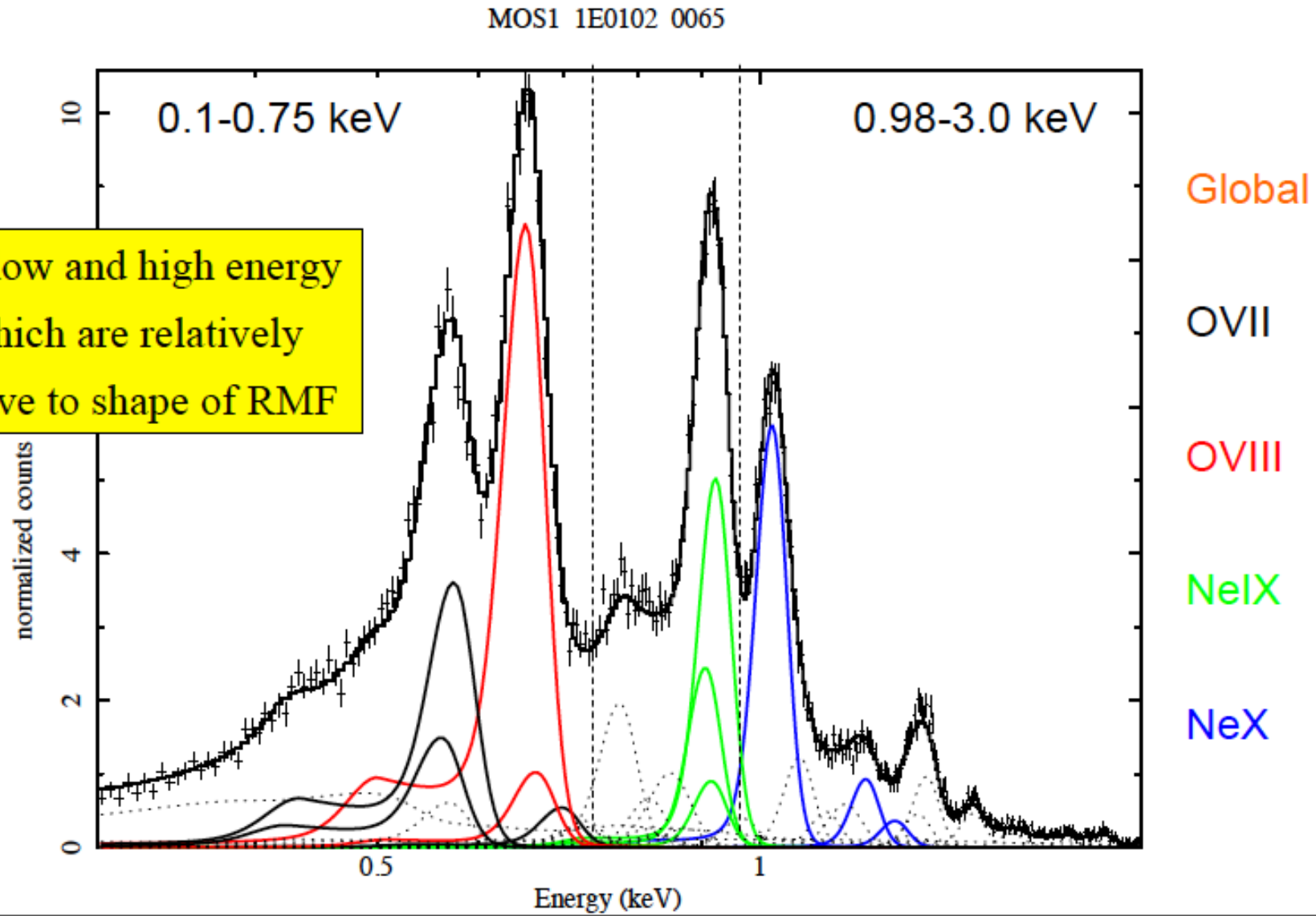
- Primary Monitoring Source: SNR E0102
- Properties:
  - Have standard source spectral model
  - Known to be stable (EPIC-pn)
  - Regularly observed throughout mission
- Multiply standard source model by contamination model (VARABS)
- Contaminant: C8H8 (c.f. RGS)
- Derive predicted model hardness ratio
- Compare with observed data hardness ratio to derive contaminant depth
- Validate contaminant model by XCAL comparison of selected sources (RXJ1856, Blazars) with EPIC-pn



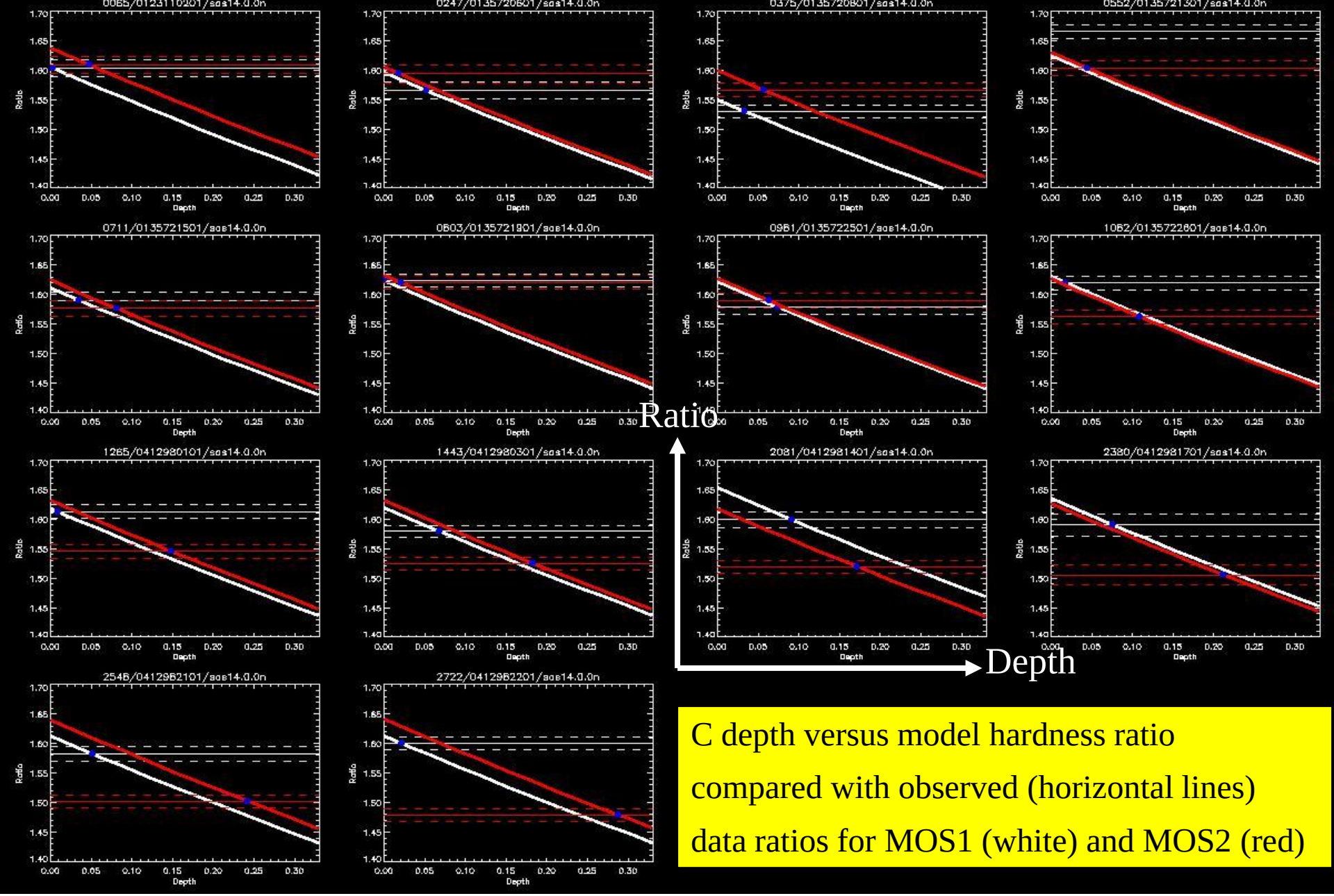
Use IACHEC standard model of 1E0102 as calibrator. Model based on input from several missions but dominated by RGS

IACHEC Standard Model: https://wikis.mit.edu/confluence/display/iachec/Therma+SNR

1E0102 spectrum and shape of RMF



Choose low and high energy bands which are relatively Insensitive to shape of RMF



C depth versus model hardness ratio compared with observed (horizontal lines) data ratios for MOS1 (white) and MOS2 (red)

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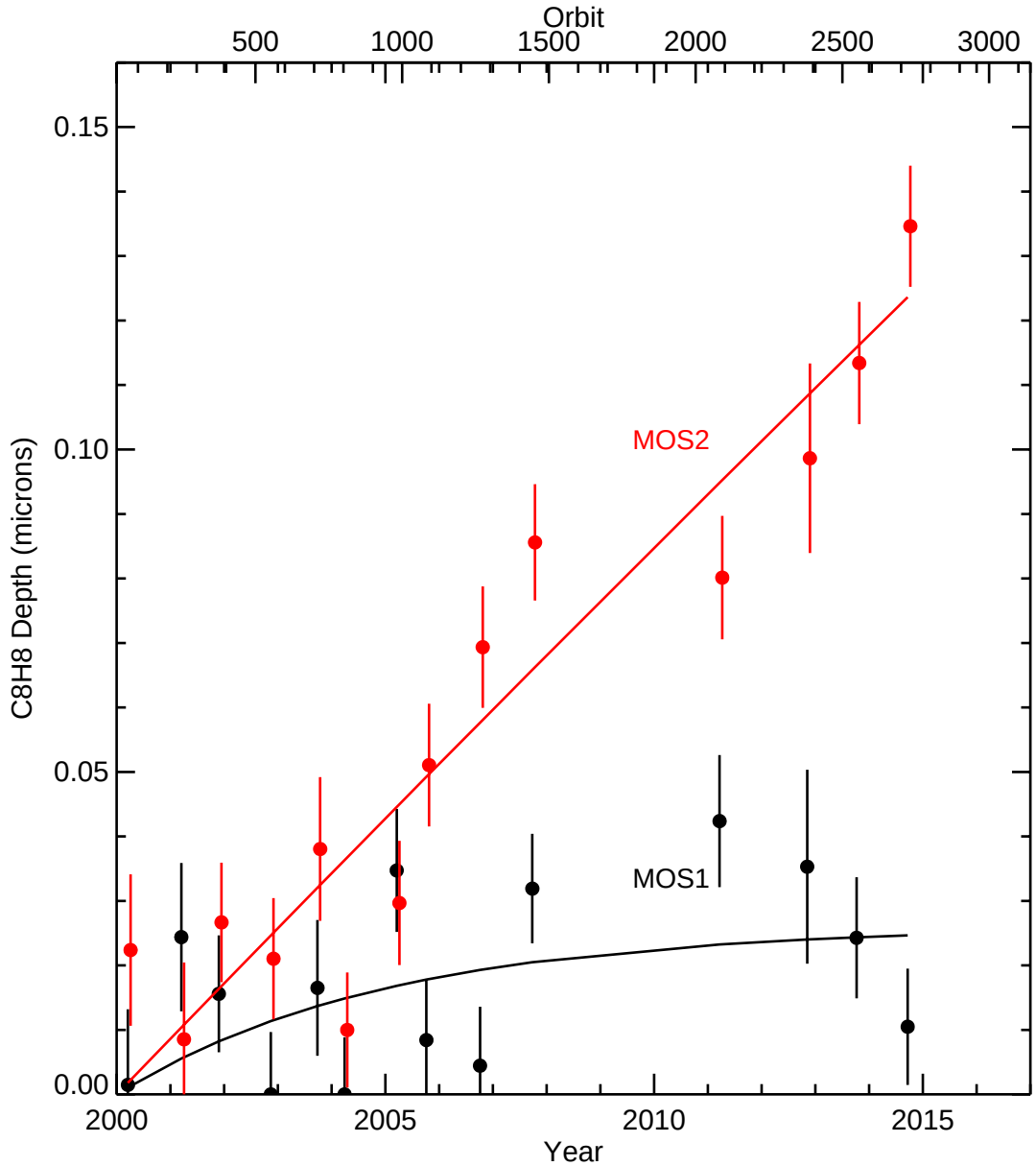
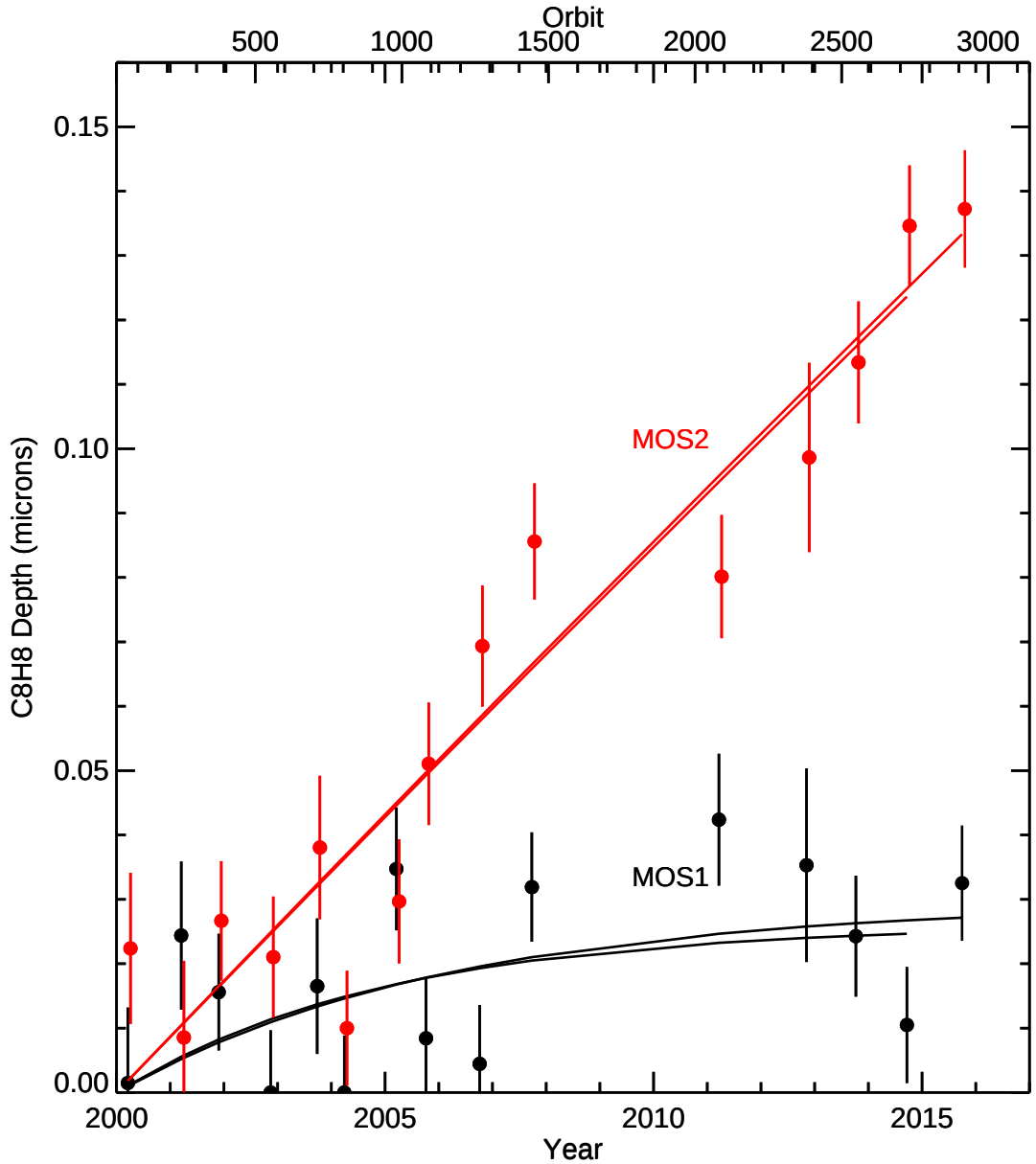
ESAC 12/04/2016



Last year's result:

MOS1 stable!

MOS2 increasing



This year's result:

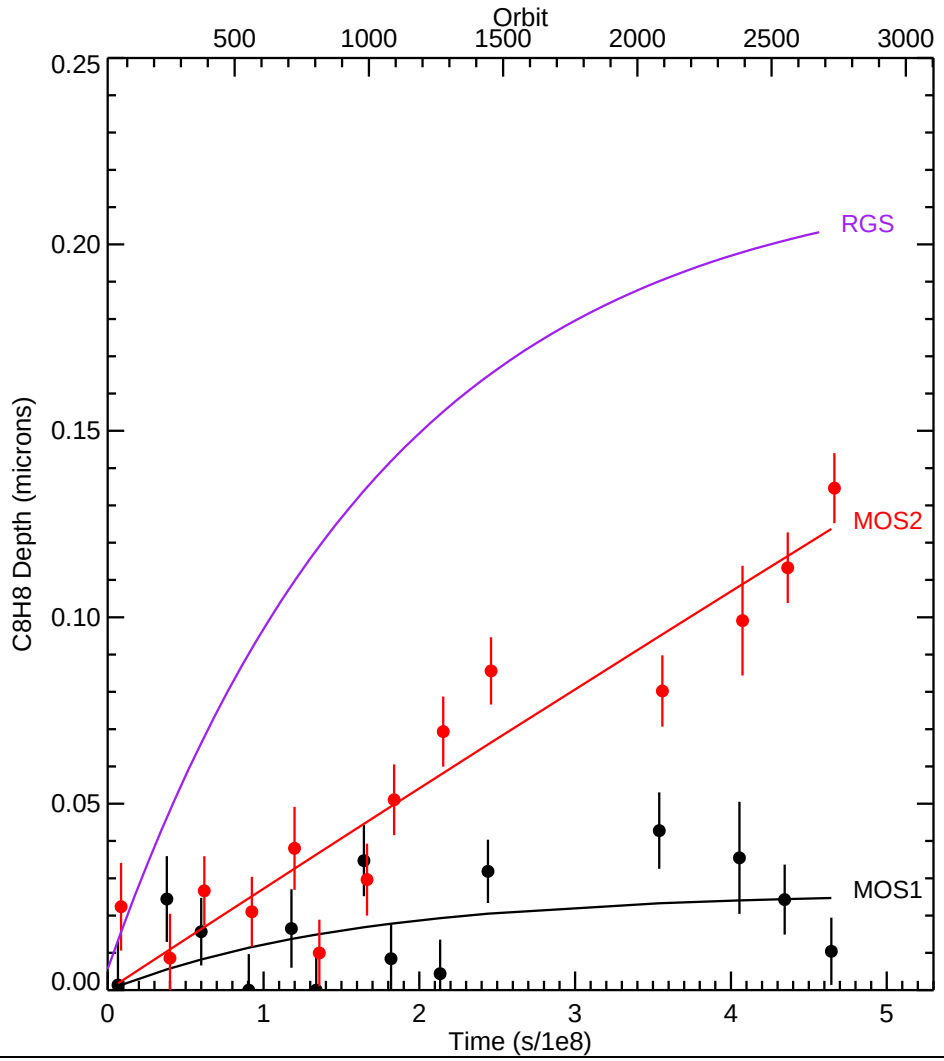
MOS1 stable!

MOS2 increasing

Rev 2910

Obs 0412982401

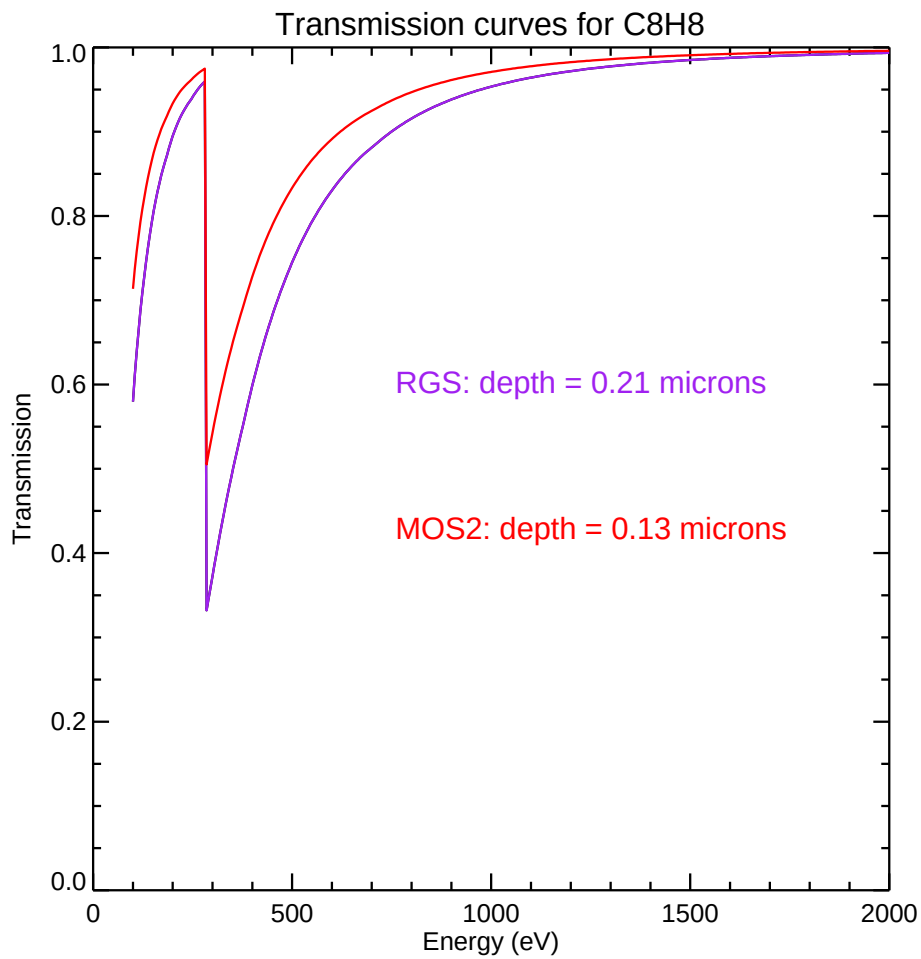
Comparison with RGS: Epoch Dependent C8H8 layer (ρ = 1.11 g/cm^{-3})



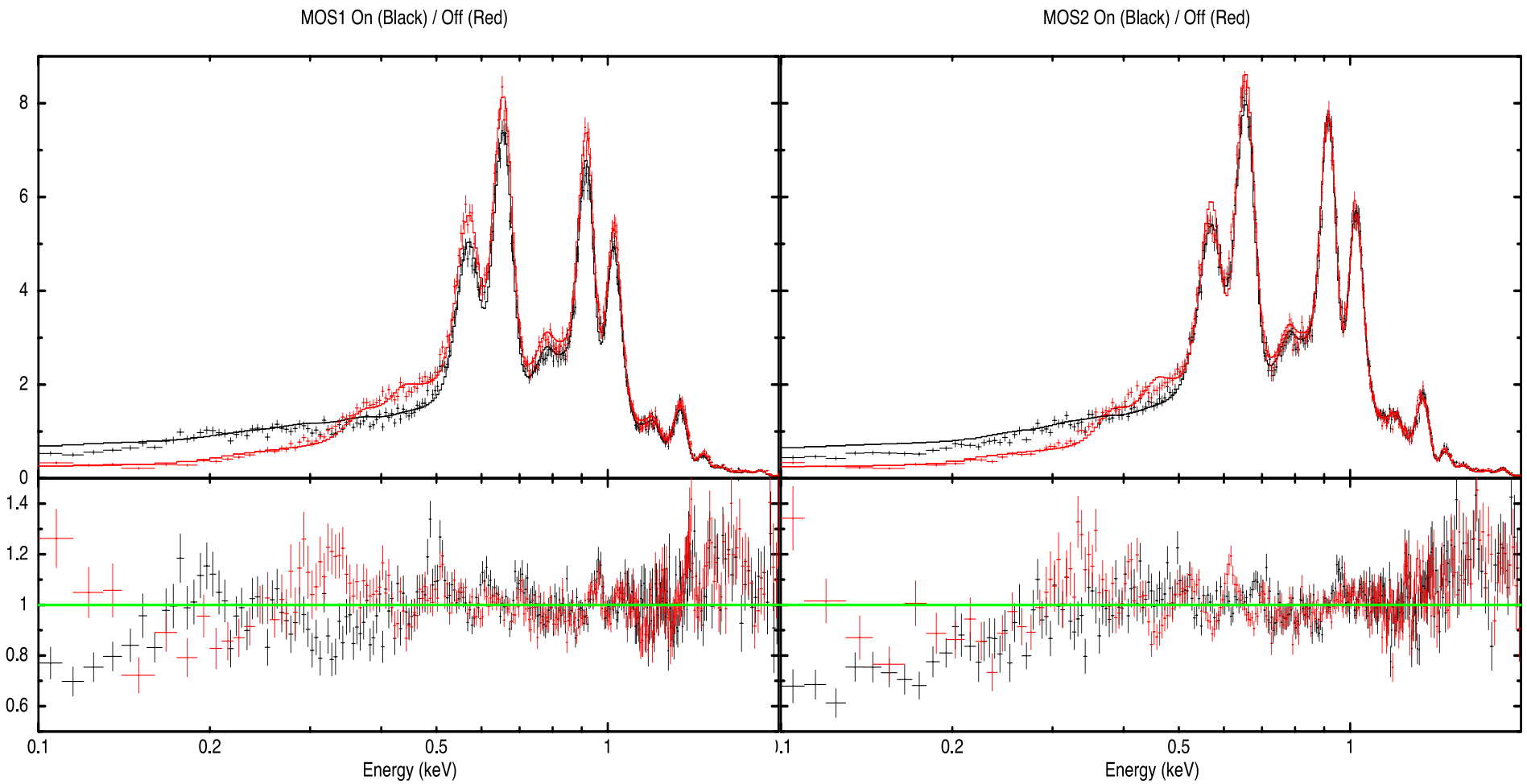
MOS2 now slightly more than 50% of RGS model.

MOS1 no strong evidence for trend. Consistent with fixed low energy QE adjustment.

Transmission curves at current epoch C8H8 layer (ρ = 1.11 g/cm^{-3})



Comparison between on-axis obs (2909) and off-axis (2910)



EPIC-MOS Contamination Monitoring

Summary

- MOS2 trend continues upwards. Layer depth now ~50% as seen on RGS
- MOS1 little evidence for trend.
- XMM-Newton contamination much less than Chandra or Suzaku
  (see IACHEC contamination WG for latest results)
- Still no idea why MOS2 is different from MOS1
- General response model (rmf/arf) looks “ok”.

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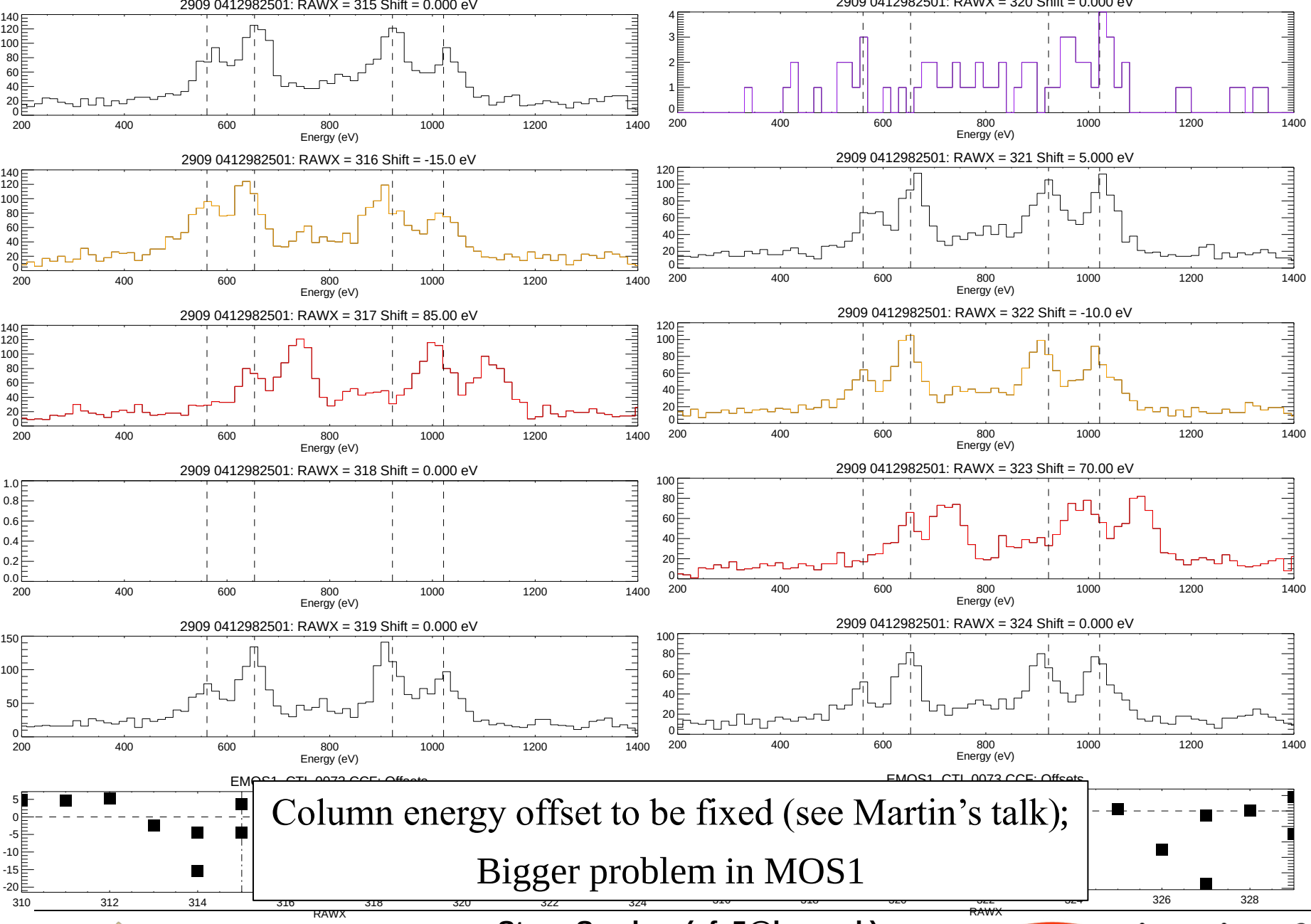

Column energy offset to be fixed (see Martin's talk);

Bigger problem in MOS1