

Contamination WG Summary

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Membership

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Cor de Vries (XMM-Newton RGS)

Objectives

- comparison among instruments and missions
 - chemical composition
 - time dependence
 - spatial dependence (micron to cm scales)
 - temperature dependence (where is the coldest surface?)
 - environmental dependence (orbit)
- mitigation for current instruments
 - celestial monitoring targets
 - effects on calibration and science results
 - "bake-out" procedures
- mitigation for future instruments
 - design (cold traps, contamination blocking filters)
 - procurement
 - ground procedures
 - ground testing and calibration
 - on-orbit monitoring

Contamination WG Plan (2016)

- legacy heritage WG white paper
- lessons learned for design and ground mitigation
- lessons learned for first light targets, “zero-contamination” baseline
- targets and observation strategies to detect and monitor contamination
- Suzaku vs. Chandrayaan vs. XMM comparison paper
- Eric & Herrmann will start this as a PIT (A/I Eric due 2016 August 30)
- 12th IACHEC will be a working session

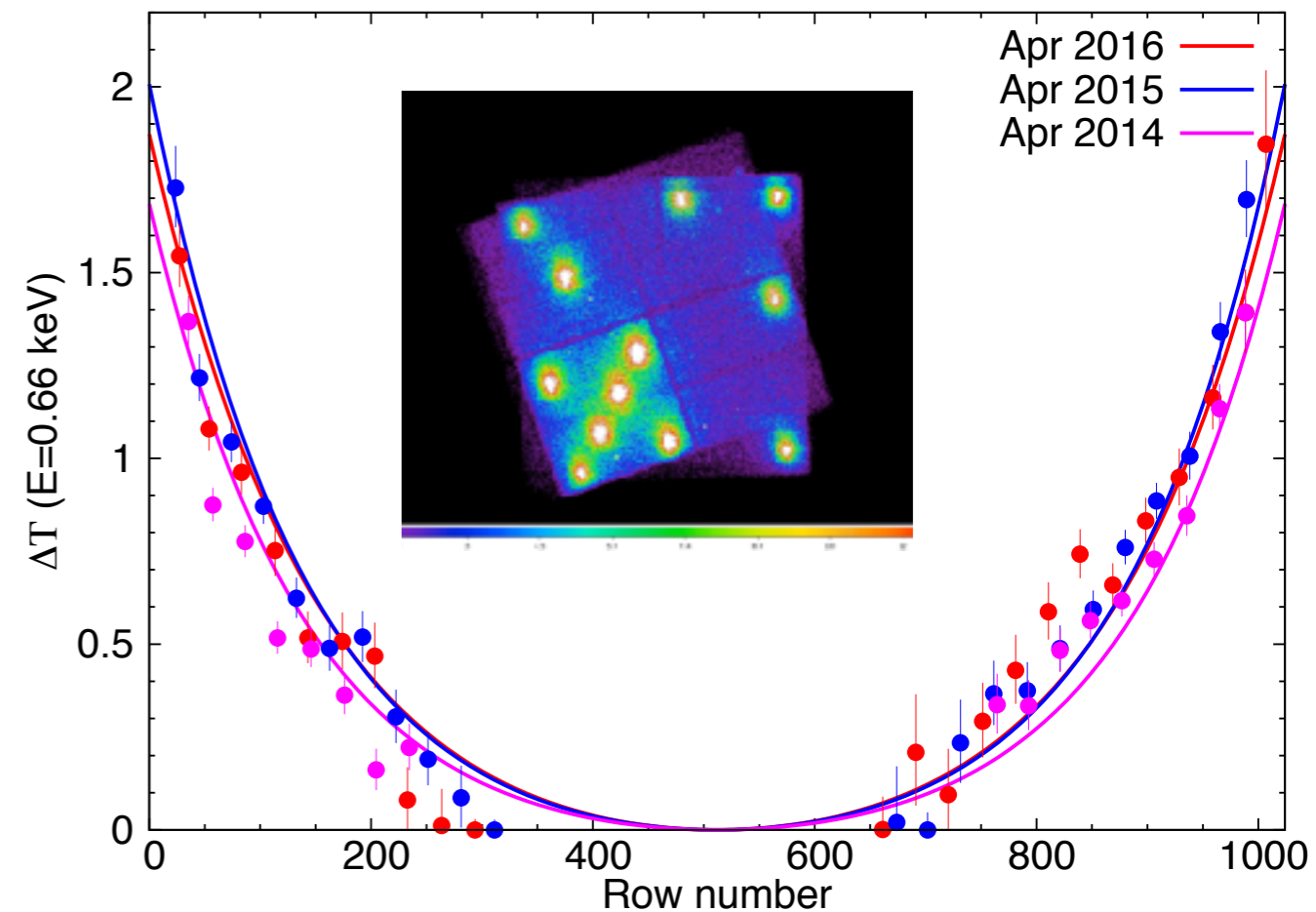
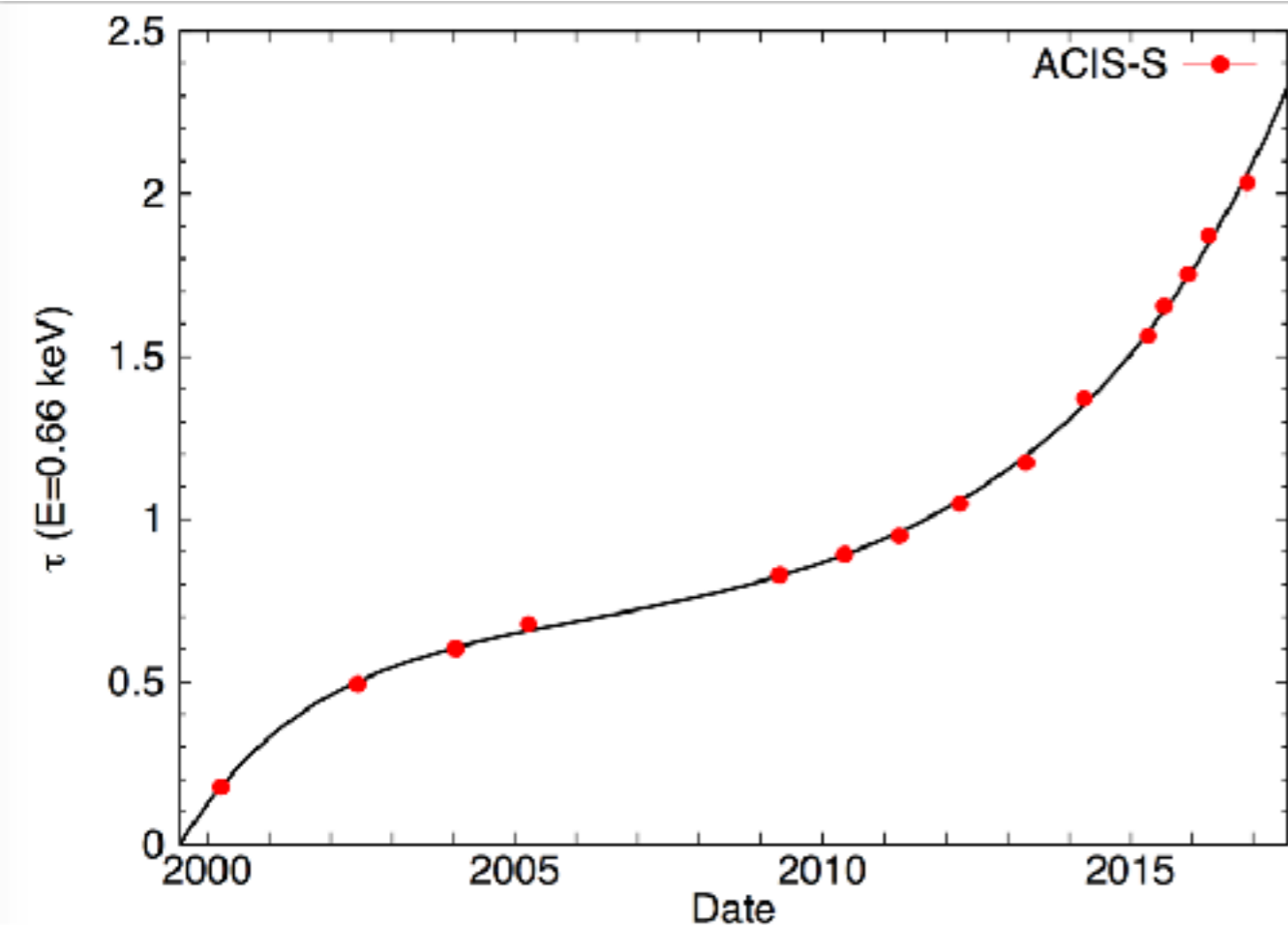


Contamination WG Agenda

- A. Bogdan
"Characterizing the contaminant on Chandra ACIS using Abell 1795 observations"
- H. Marshall
"The New Chandra ACIS Contamination Model"
- K. Mori and E. Miller
"Discussion of Hitomi SXI Contamination Measurements"
- S. Sembay,
"XMM EPIC-MOS Contamination Update"

Chandra/ACIS with A1795 (Akos)

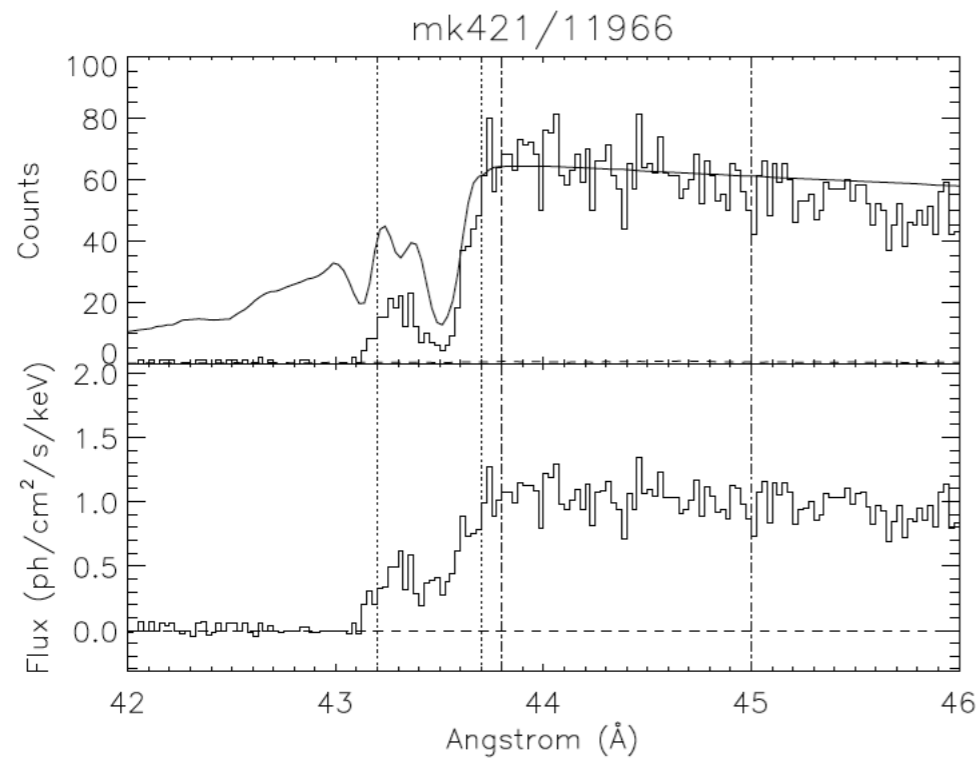
- The time evolution of the contaminant can be described with two exponential models
- The spatial structure is exponential, possibly another contaminant layer that is less sensitive to temperature differences between the center and edge of the detector



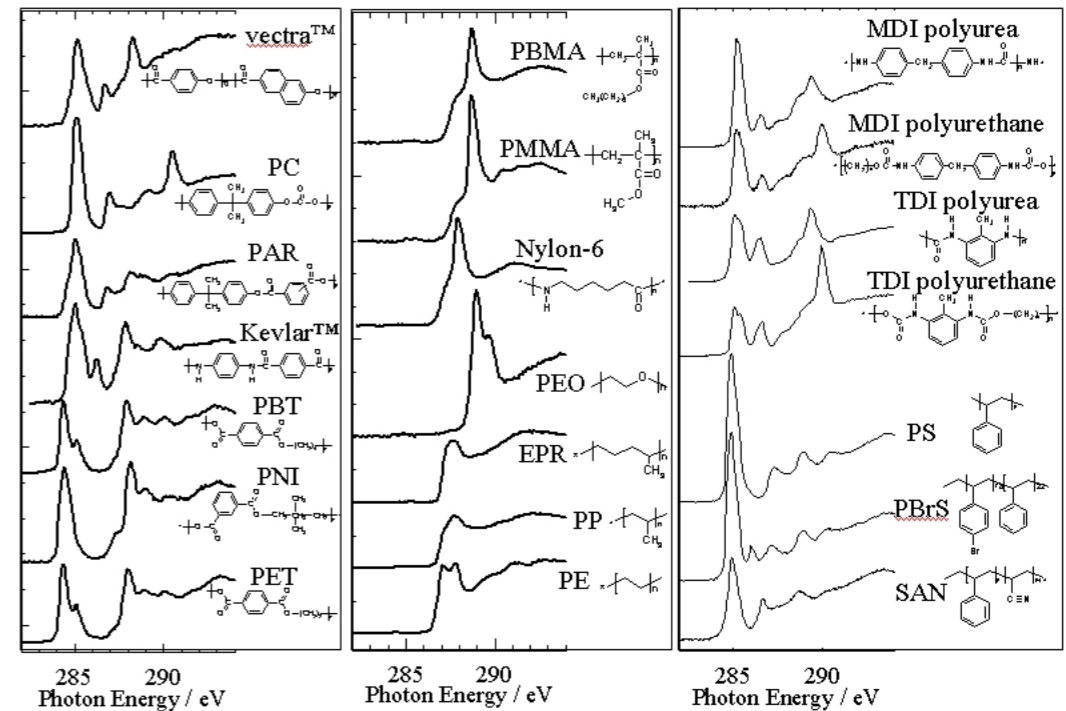
Chandra/ACIS Physical Model (Herman)

- aromatic compound C-K resonance feature
- v9968 released in caldb as version N0010
- Tested against IE0102, clusters, grating data, SNI987a (Dave)

C-K Resonance Feature

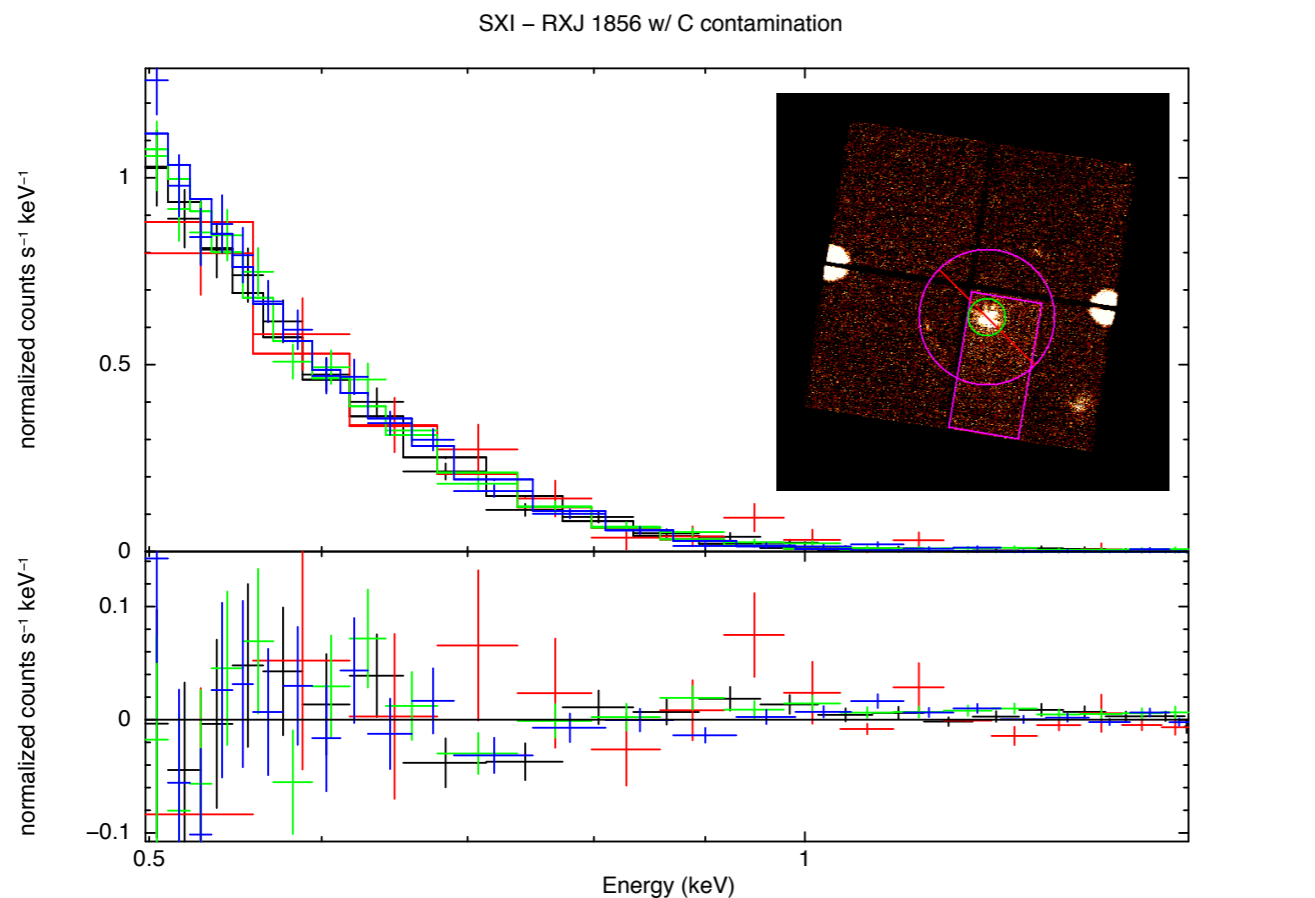


Typical C-K edges

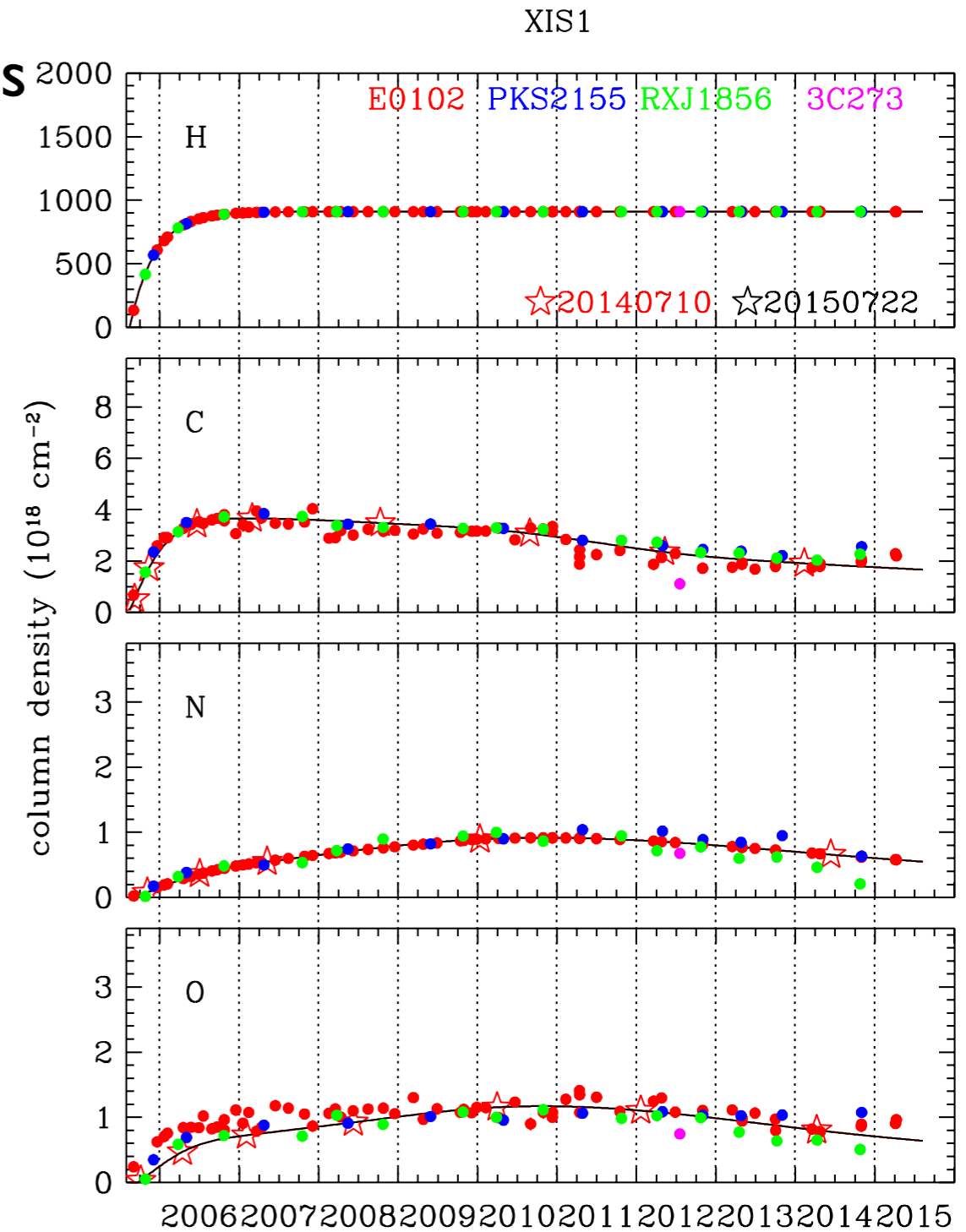


Hitomi/SXI Contamination Limits (Eric)

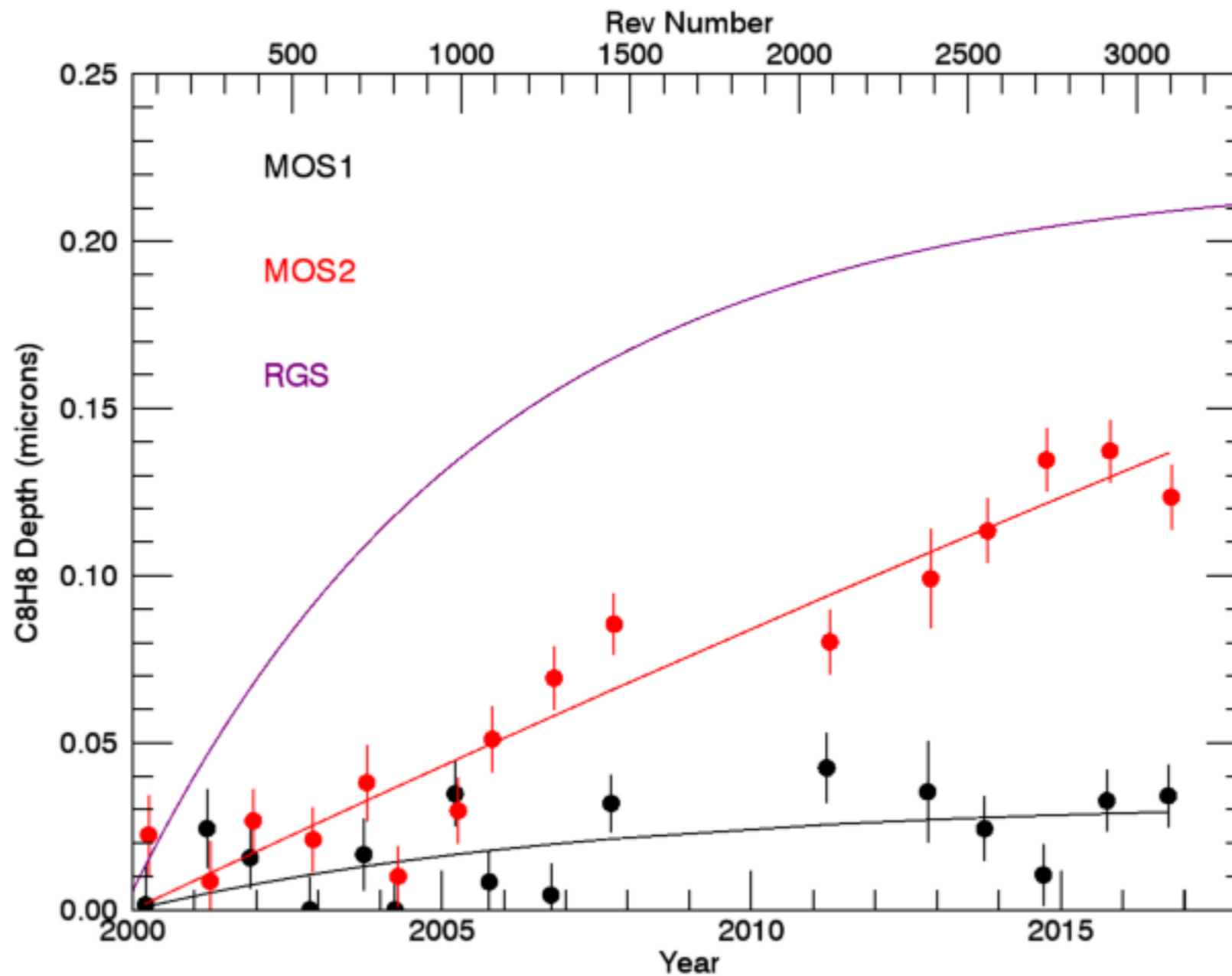
- RXJ1856: 2 observations, 1 week apart
- $N_c \leq 7 \times 10^{17} \text{ cm}^{-2}$ in both epochs
- upper limit consistent with $t = 0$ contamination of Suzaku



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XMM-Newton (Steve)



NB: No contamination on EPIC-pn, which has a cold trap.

Contamination WG Plan (2017)

- instrument-specific refereed papers (e.g JATIS)
- Chandra/ACIS monitoring, modeling (Herman et al.)
currently: a few SPIE papers
- Suzaku/XIS observational paper (Eric, XIS team)
currently: Koyama+2007, Tech. Description, web pages
- XMM EPIC-MOS? RGS?
currently: CCF documentation
- first step toward legacy white paper via Optics WG



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Optics WG Contamination WG

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