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# **IACHEC Thermal SNRs** **Working Group Report**

**Tuesday April 21, 2026**

**14:30 UT = 16:30 CEST = 10:30 EDT = 23:30 JST**



## **WG Meeting Agenda**

### **E0102:**

- Paul: now include Mg XI norm in the fit, stop fitting O VII in 2021, stop fitting O VIII in 2024
- Konrad: eROSITA, Eric: Suzaku, Martin: pn, MOS & RGS also fit the Mg XI norm

### **N132D:**

- Hiromasa: compare XRISM observations to each other, compare Foster et al. 2025 model and XRISM model

### **Cas A:**

- Manan: UltraSPEX results from XRISM. Can we use the information on energy shifts and line broadening to inform an IACHEC model ?

### **Tycho:**

- Leila: Chandra and XRISM results. Should the other missions use Tycho as a calibration source ? Swift has been using Tycho.

### **Kepler:**

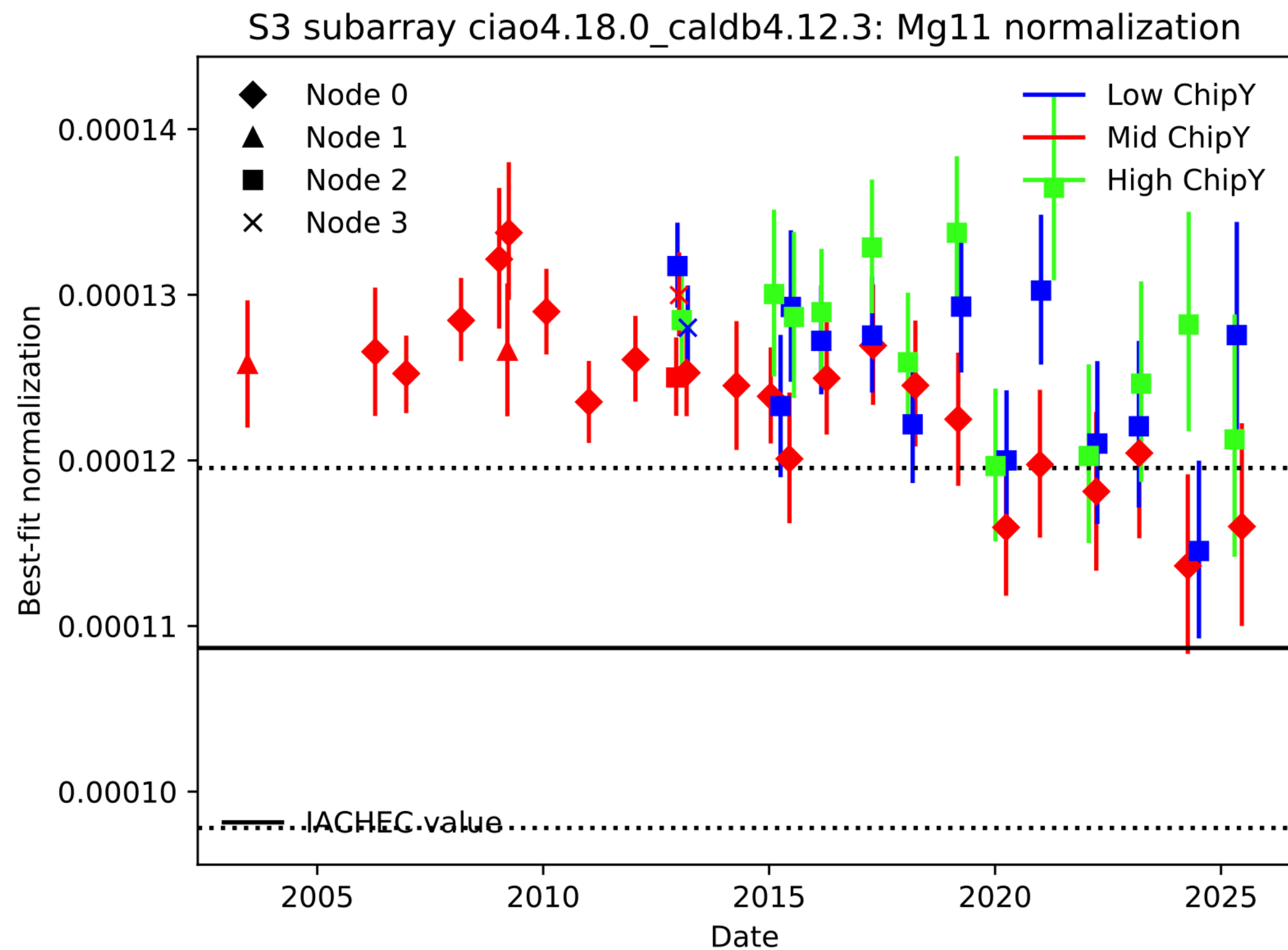
- Brian G: Kepler, NuSTAR uses the Fe-K line



# MgXI Line Normalizations for 1E 0102.2-7219 (E0102)

- ACIS S3 (a BI CCD) line normalizations are 5-20% higher than the IACHEC reference value (Ratzlaff SAO)
- Suzaku XIS (Miller MIT) and eROSITA (Dennerl MPE) values are also higher than the IACHEC value
- An investigation into the pn, MOS1/MOS2, and RGS (Stuhlinger ESAC) values is in progress

## Ratzlaff (SAO)



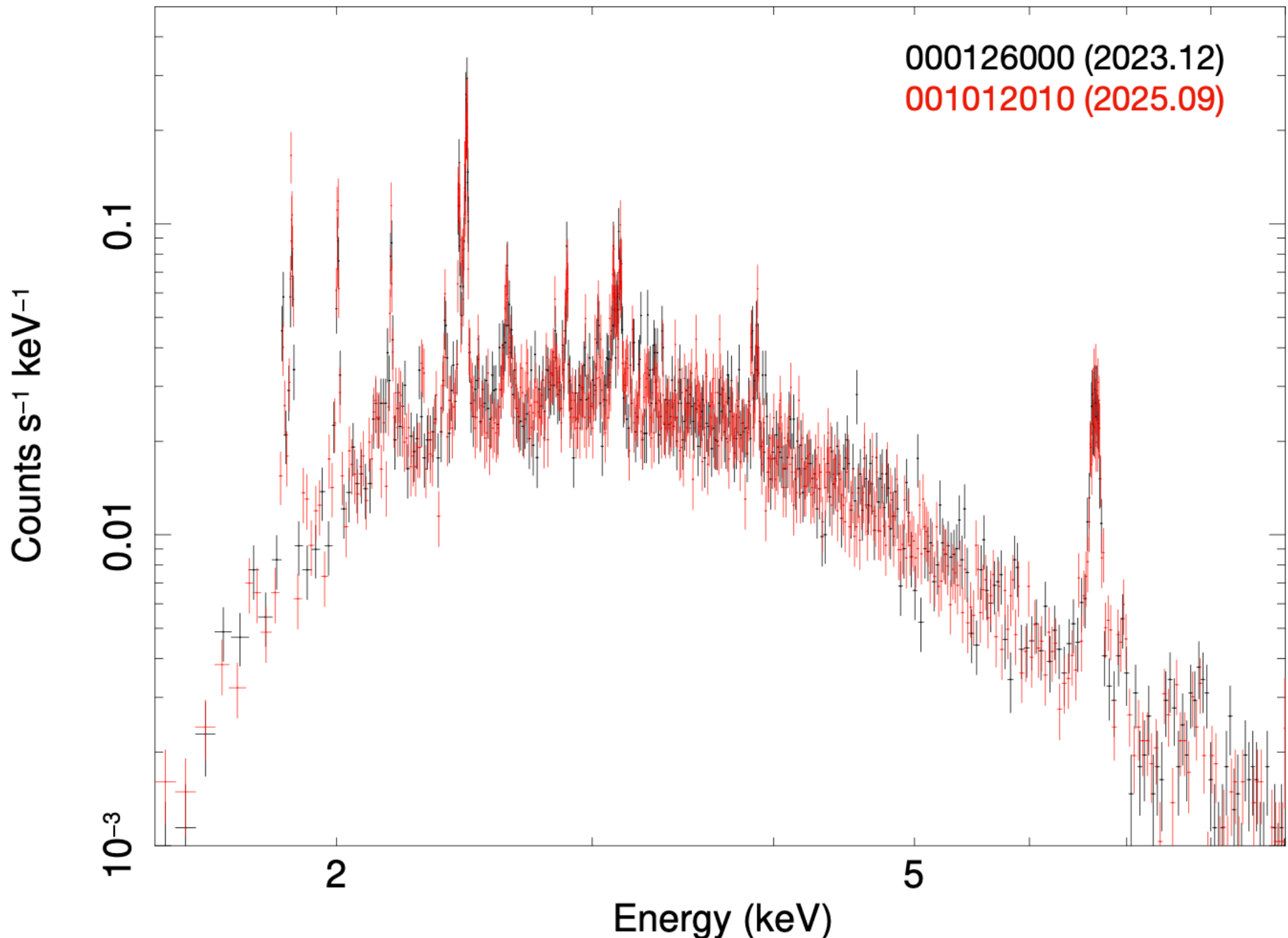
Instrument	Mg11 ( $10^{-3}$ photons $\text{cm}^{-2}$ $\text{s}^{-1}$ )	Error Lo	Error Hi
IACHEC	0.109		
ACIS-S3	0.128	0.125	0.132
XIS0	0.121	0.118	0.124
XIS1	0.124	0.121	0.128
XIS2	0.117	0.114	0.121
XIS3	0.128	0.125	0.132
eROSITA	0.121	0.116	0.126



# XRISM Resolve Spectra of N132D

Suzuki (U. of Miyazaki)

- Two observation epochs, one observation in 2023 and two observations in 2025
- Data are consistent with each other
- XRISM Collaboration et al. 2024 reveals different velocities and broadenings for Si & S and Fe
- $\sigma_v(\text{IME}) \sim 450 \text{ km s}^{-1}$  and  $\sigma_v(\text{Fe}) \sim 1670 \text{ km s}^{-1}$ ,  $z(\text{IME}) \sim 250 \text{ km s}^{-1}$  and  $z(\text{Fe Ly}\alpha) \sim 890 \text{ km s}^{-1}$



## XRISM Collaboration et al. (2024)

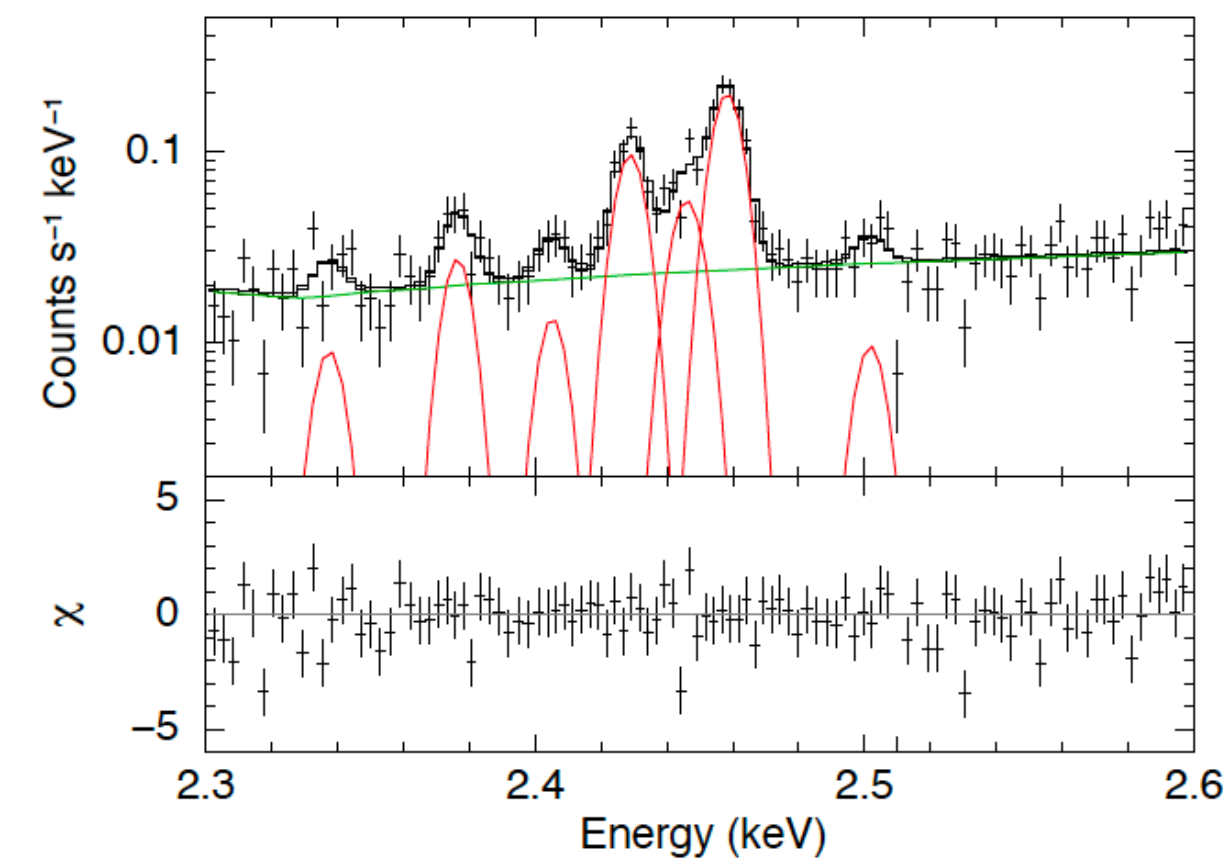


Fig. 3. The Resolve spectrum in the 2.3–2.6 keV band, where the SXV emission is prominent. Red and green are Gaussian functions and the bremsstrahlung continuum component of the ad hoc model, respectively. The NXB contribution is taken into account but is below the displayed flux level.

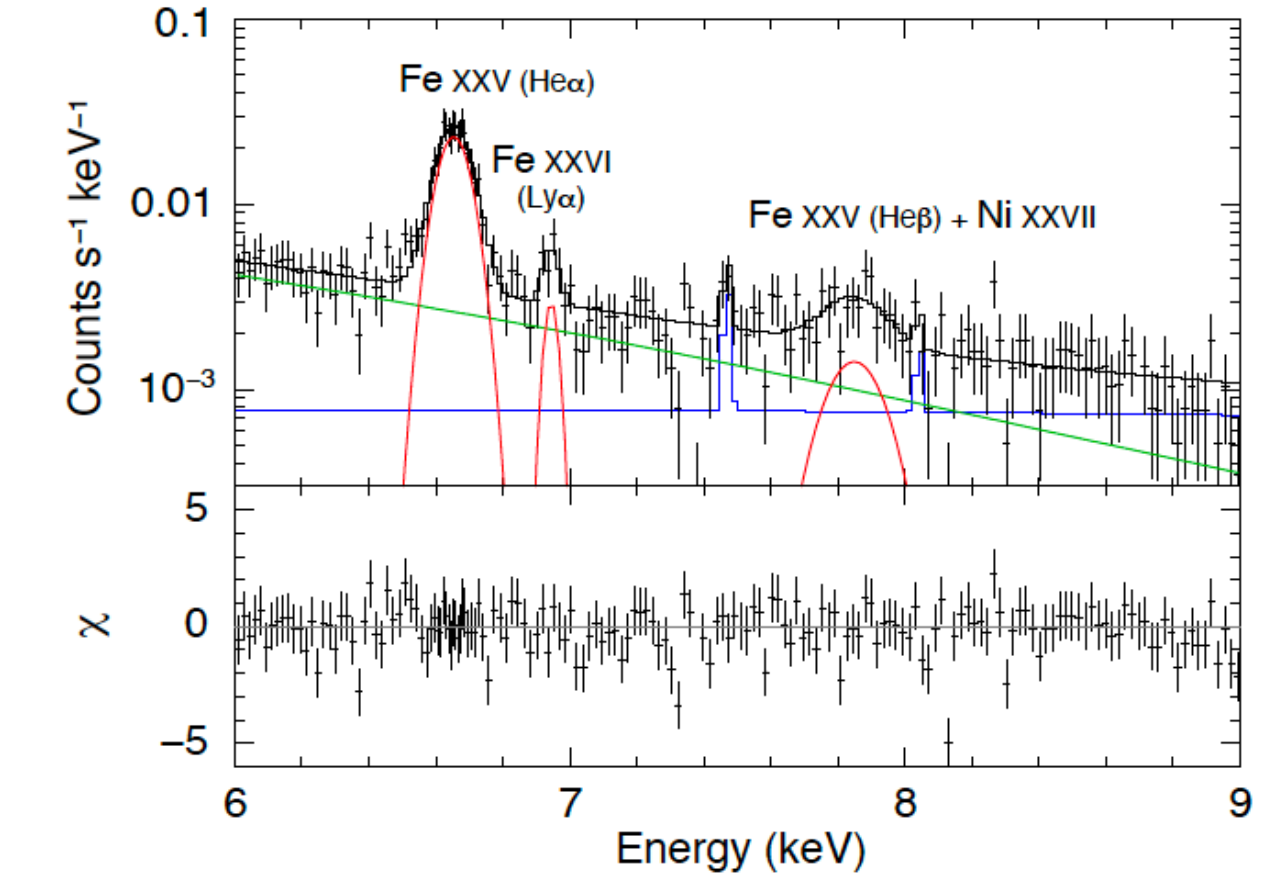


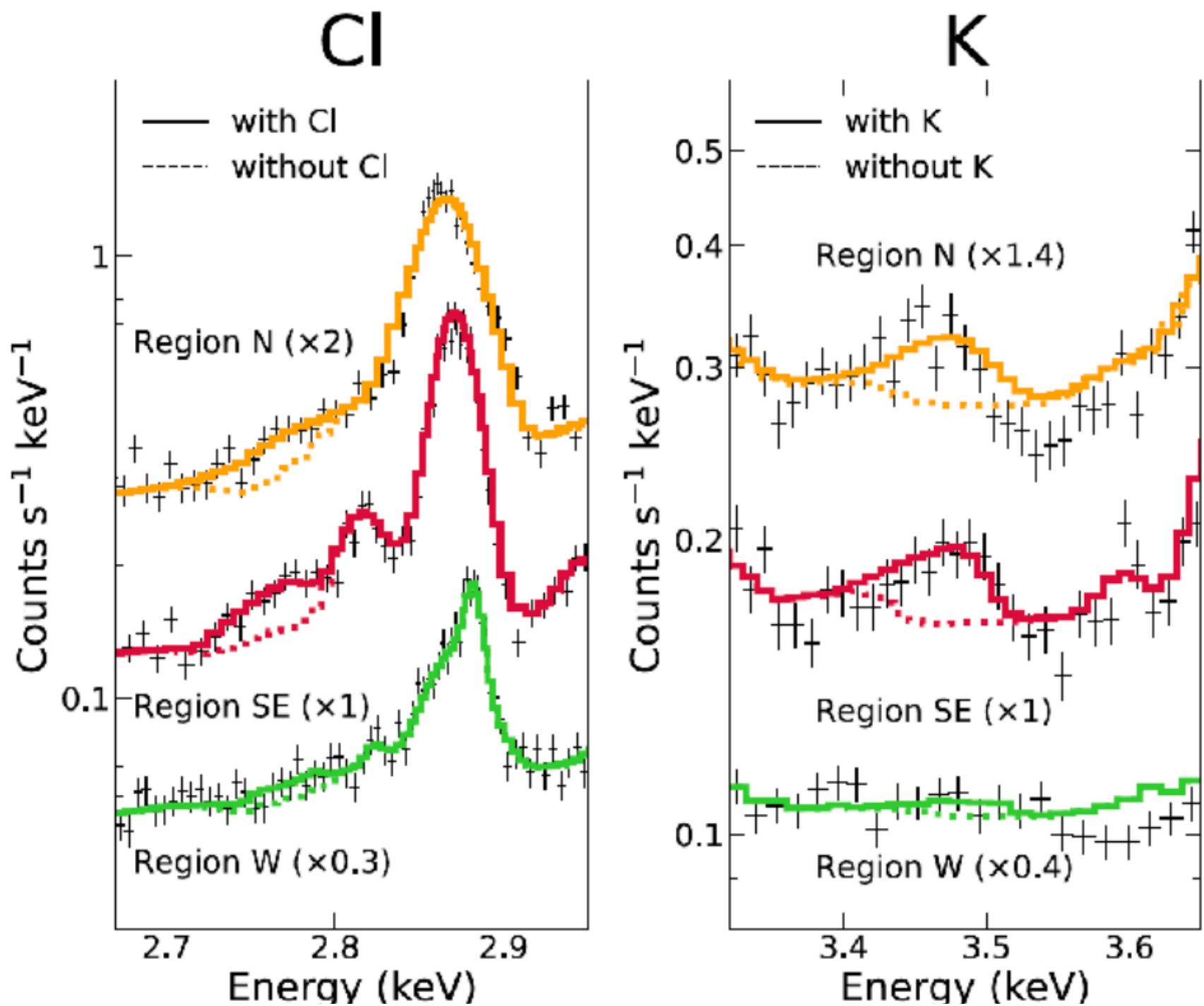
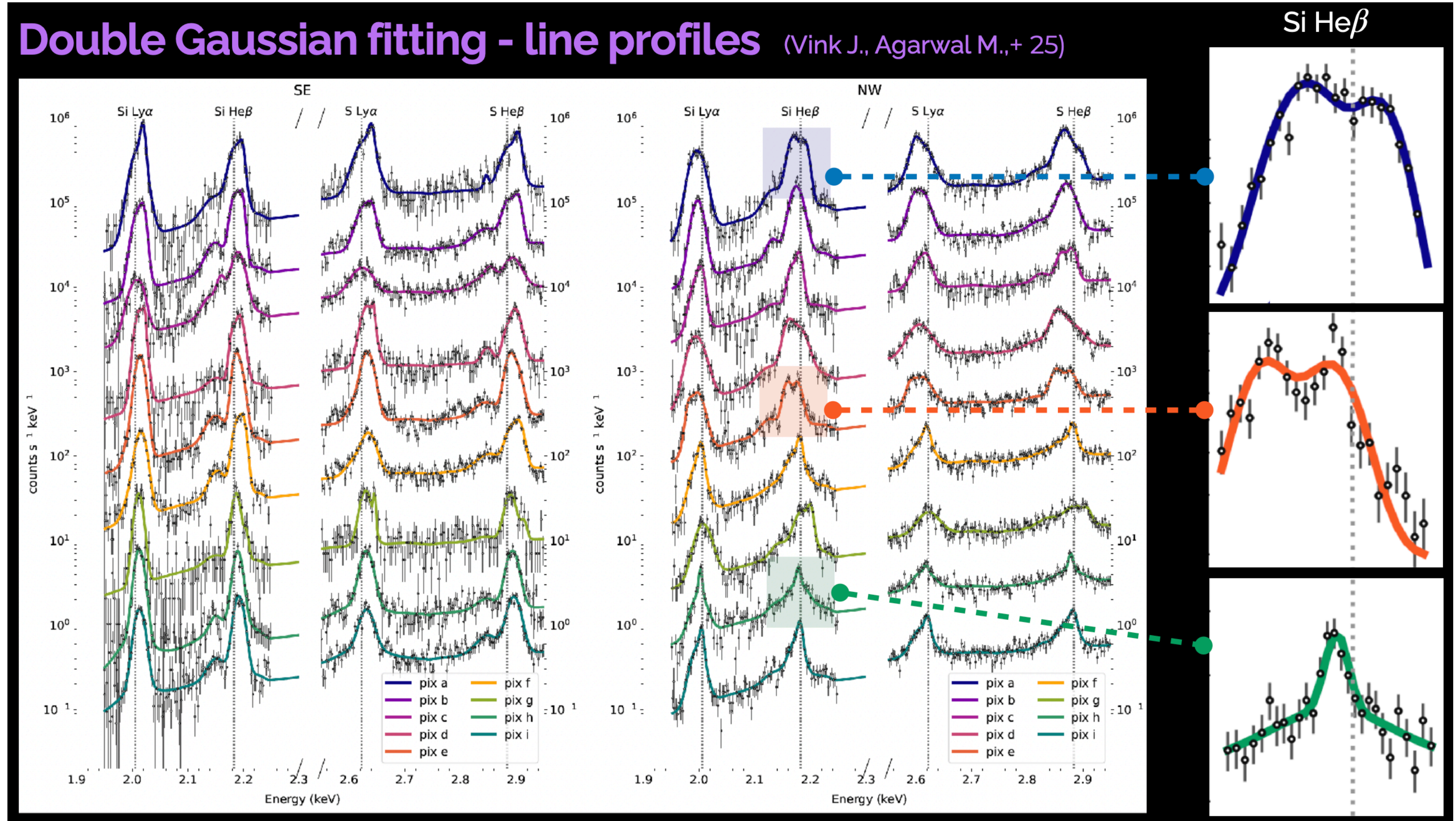
Fig. 4. The Resolve spectrum in the Fe K band. Red and green are the Gaussian functions and bremsstrahlung continuum components of the ad hoc model, respectively. Blue indicates the NXB spectrum.



# XRISM Resolve Spectra of Cassiopeia A

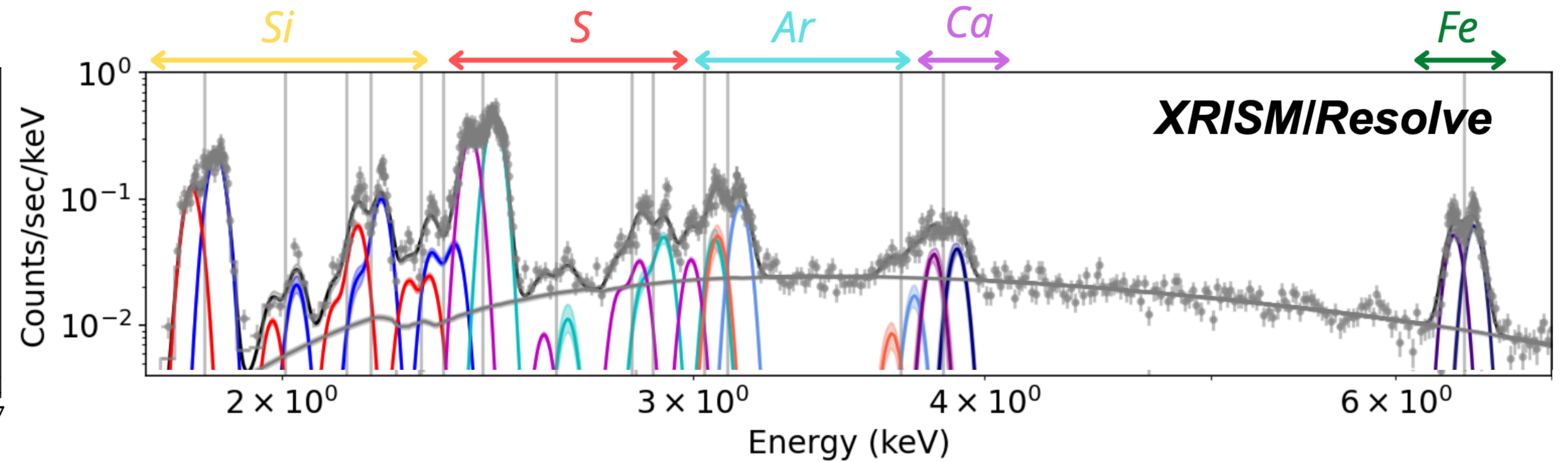
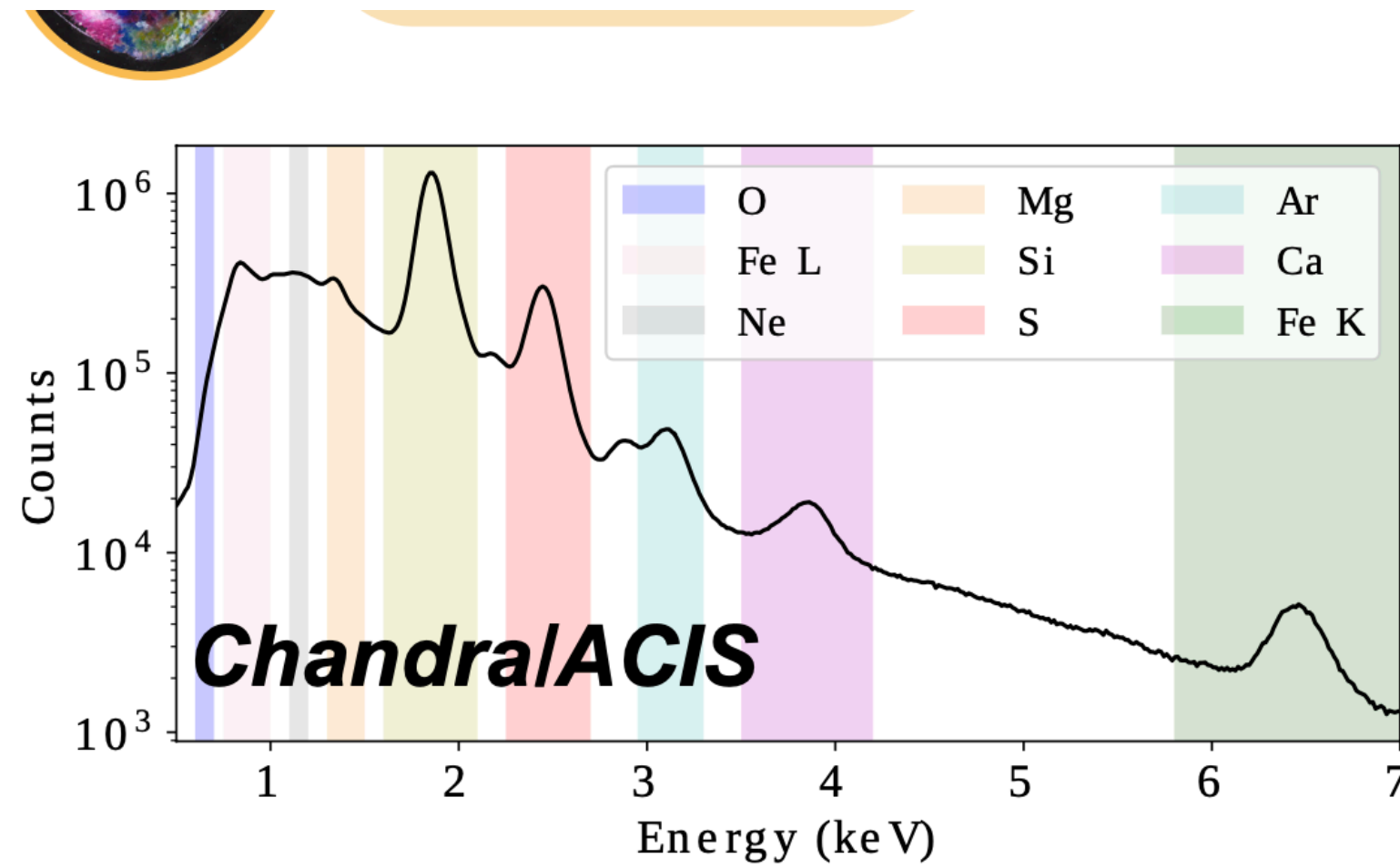
- Detection of Cl & K in Cas A (XRISM Collaboration et al. 2025) ([Sato Meiji University](#))
- Redshifts and broadening measured in 1x1 arc minute regions (Bamba et al. 2024, Vink et al. 2024, Suzuki et al. 2024, Plucinsky et al. 2024) and UltraSPEX analysis (Agarwal et al. 2026)
- How can we use this information to inform standard models for lower resolution instruments ?

XRISM Collaboration et al. 2025





# Chandra and XRISM Observation of Tycho Godinaud (CEA Saclay)



## Pros to use Tycho as calibration source:

- Bright source
- Prominent Si, S, and Fe emission lines
- No temporal variation

## But keep in mind that:

- Spatial variation of the line position.
- Spatiiale variation of the broadening of the line.

## But we have good models!

- All the Chandra parameter mapping is included in a SIXTE model (or use directly the 211 Xspec fit).
- Model fitted on XRISM observations.
- Gaussians-style models also possible.



*ROSAT-era People*

*Thank you Vadim !!!!!*

