



The emission lines maps (II) and Broad band maps (I) of the diffuse emission observed by eROSITA

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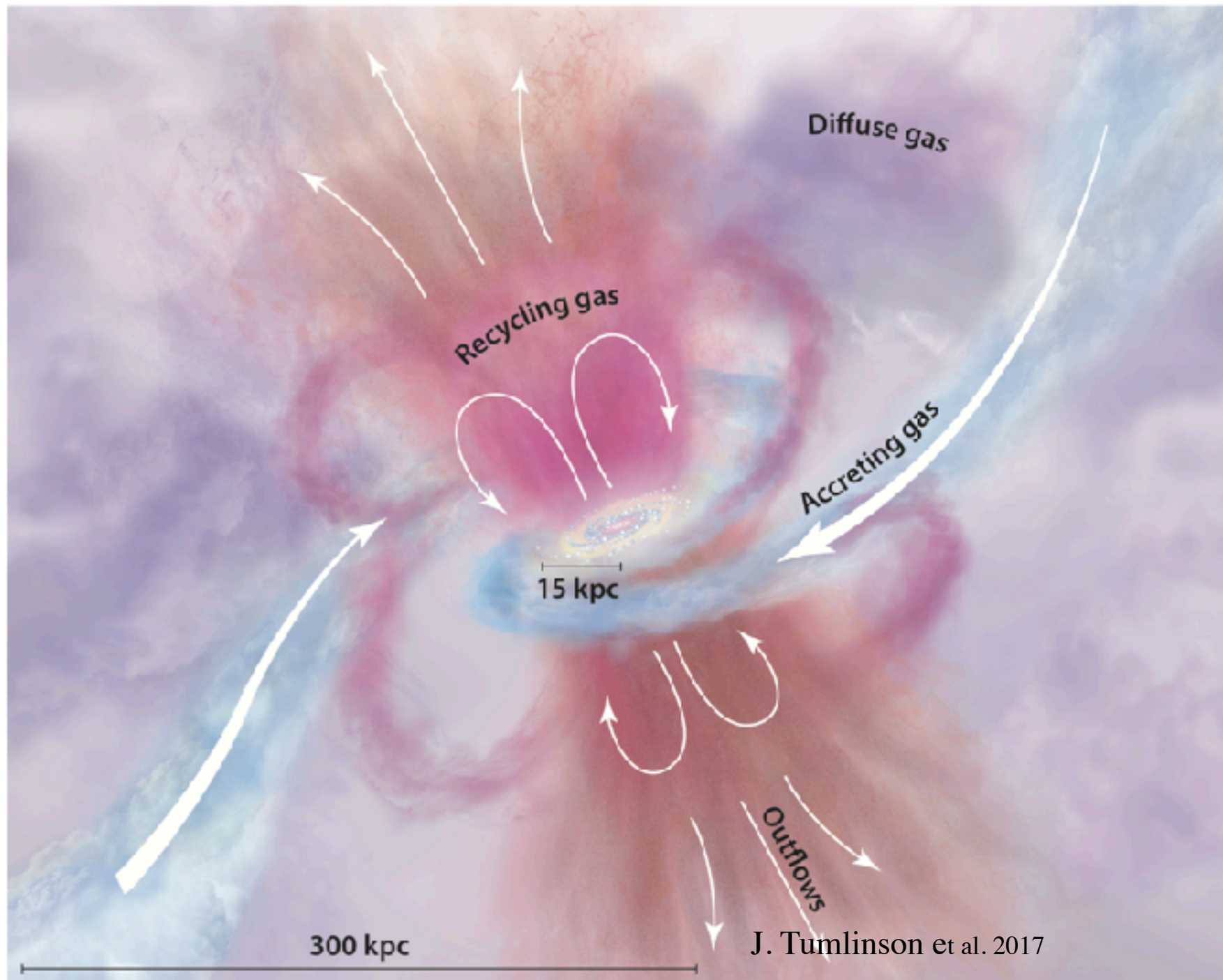
Affiliations: Max-Planck-Institut für extraterrestrische Physik

Jeremy Sanders, Nicola Locatelli, Andrea Merloni, Michael Freyberg, Andy Strong, Konrad Dennerl, Manami Sasaki, Werner Becker, Chandreyee Maitra, Georg Lamer, Peter Predehl, Yi Zhang, Konstantina Anastasopoulou, Juergen Kerp



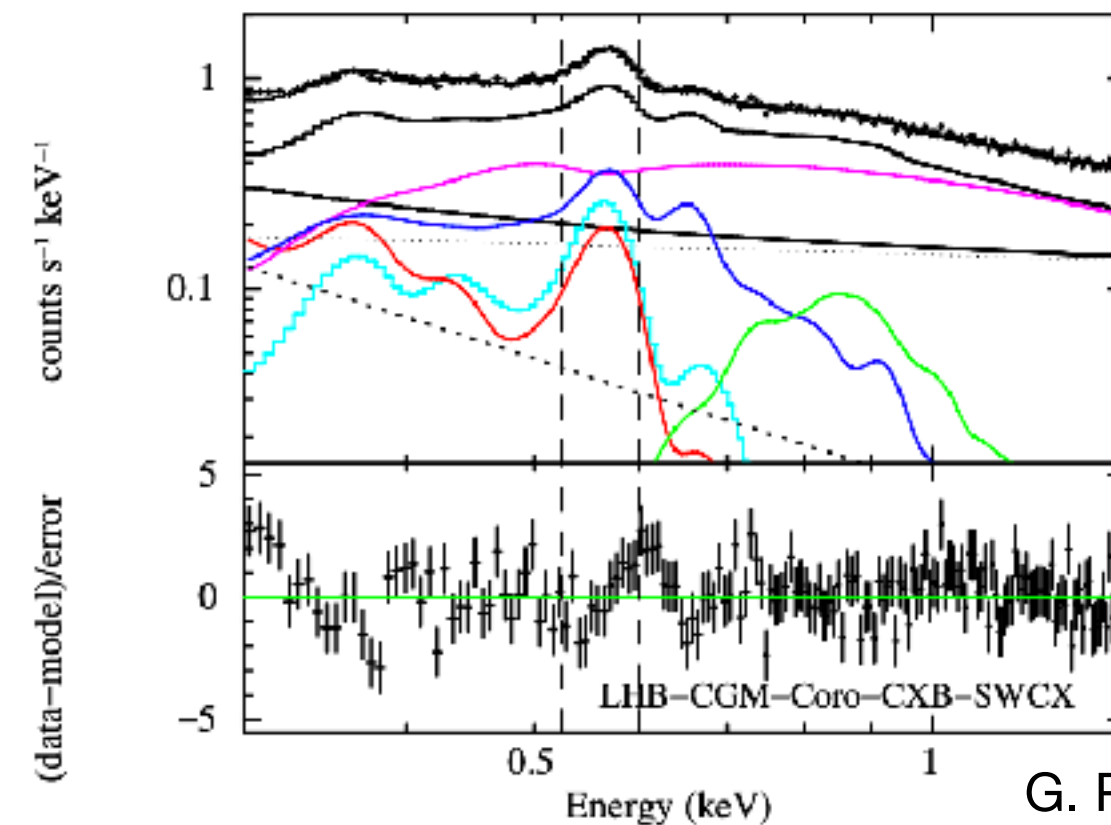
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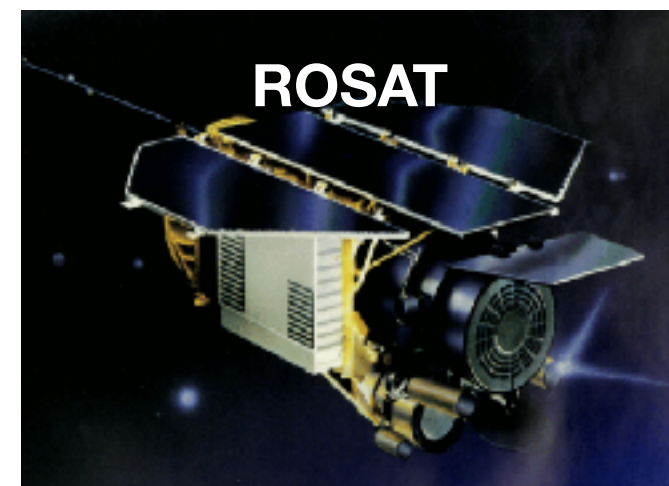
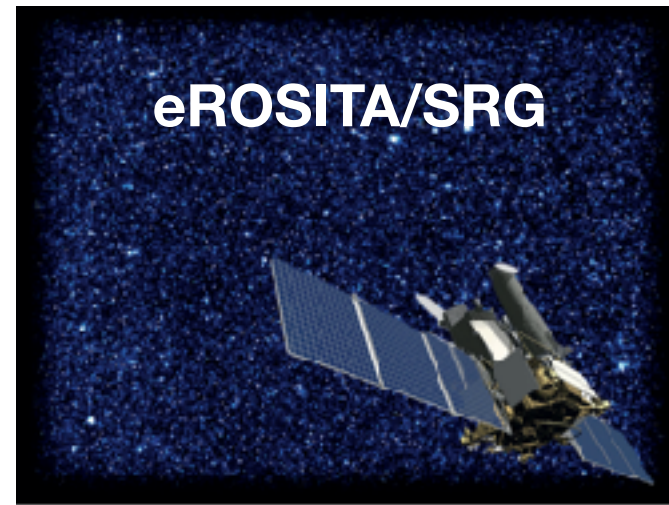
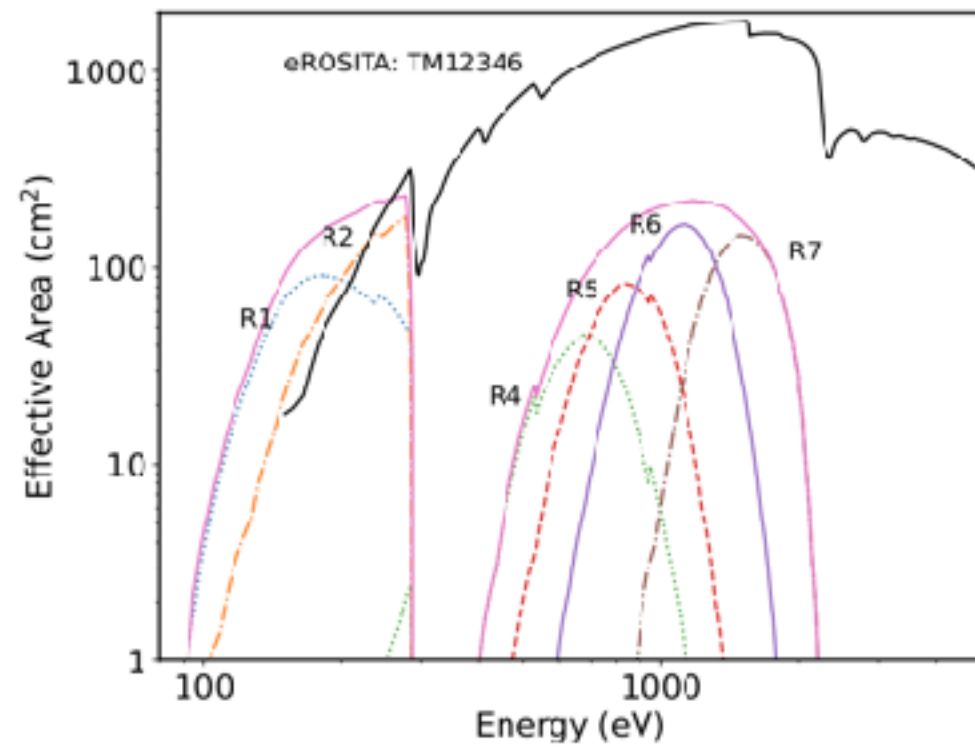




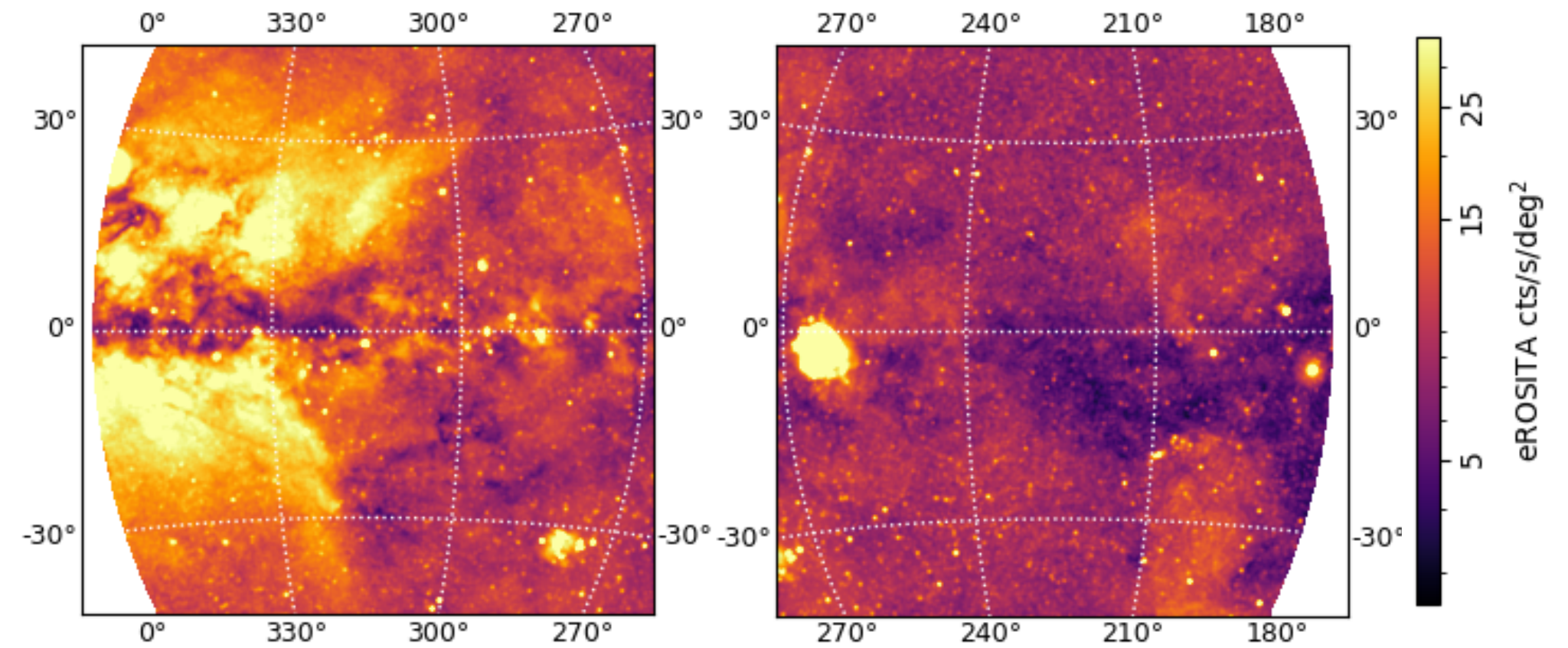
CGM (the Circumgalactic medium)

- Gravitationally bonded gas (a few hundred kpc)
- Multiphase: up to $\sim 10^6$ K
- The major potential reservoir for the missing baryons
- Essential in regulating the formation and evolution of galaxies

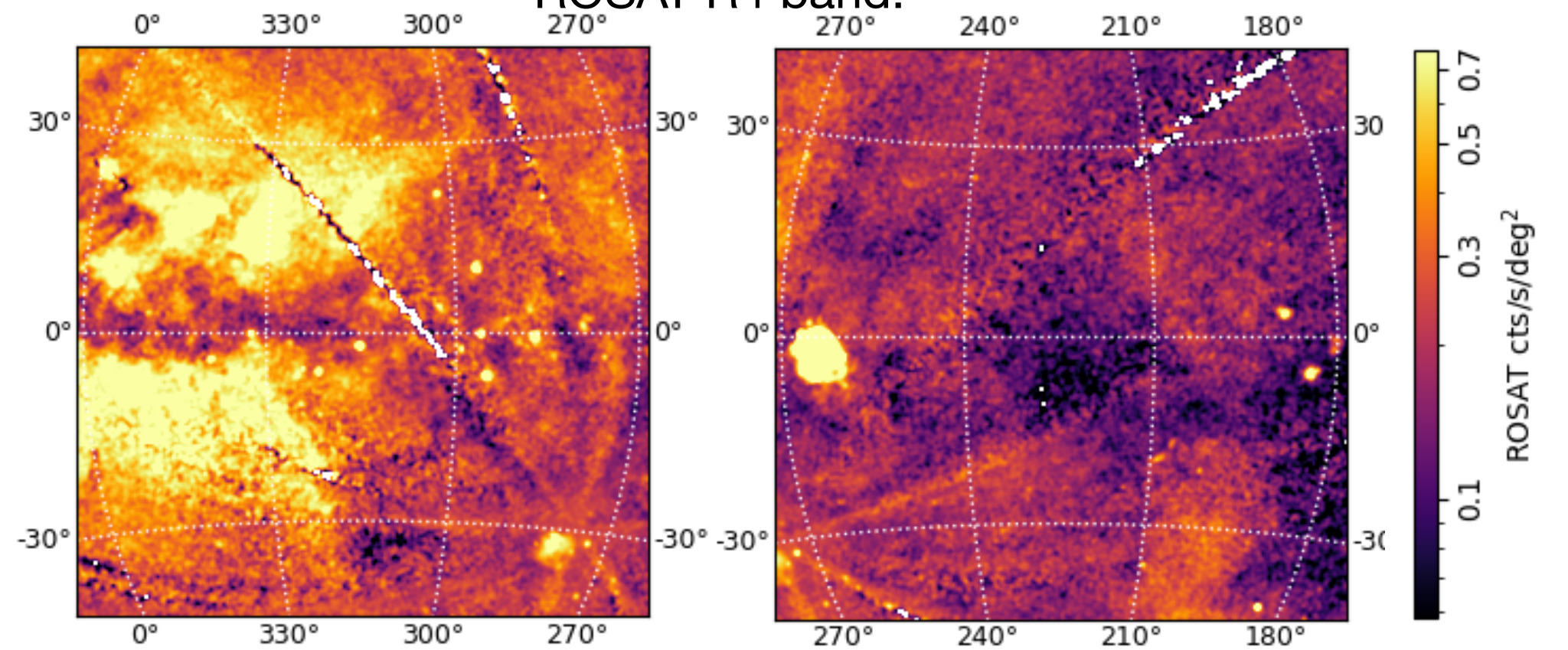




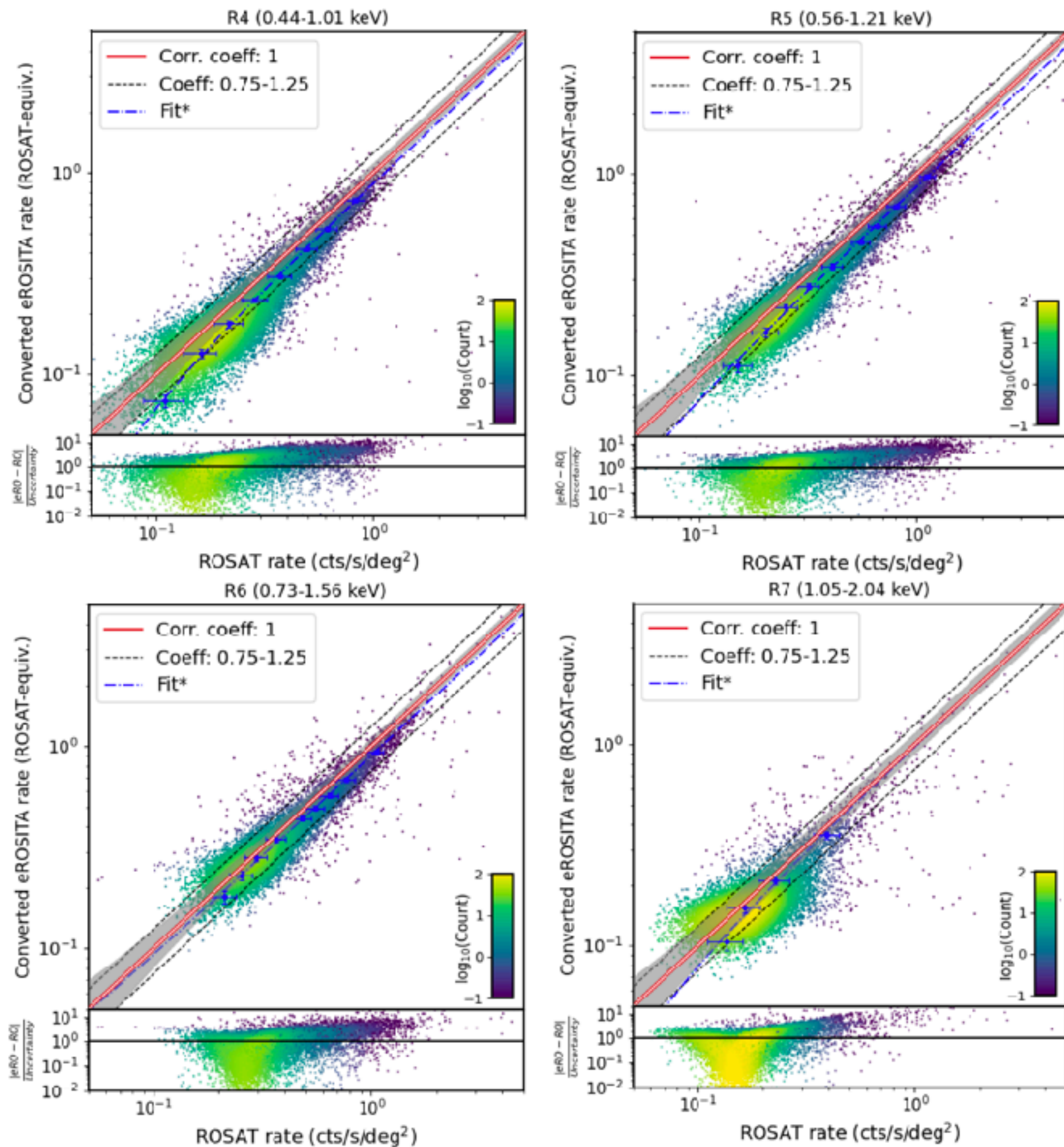
eRASS01 R4 band:



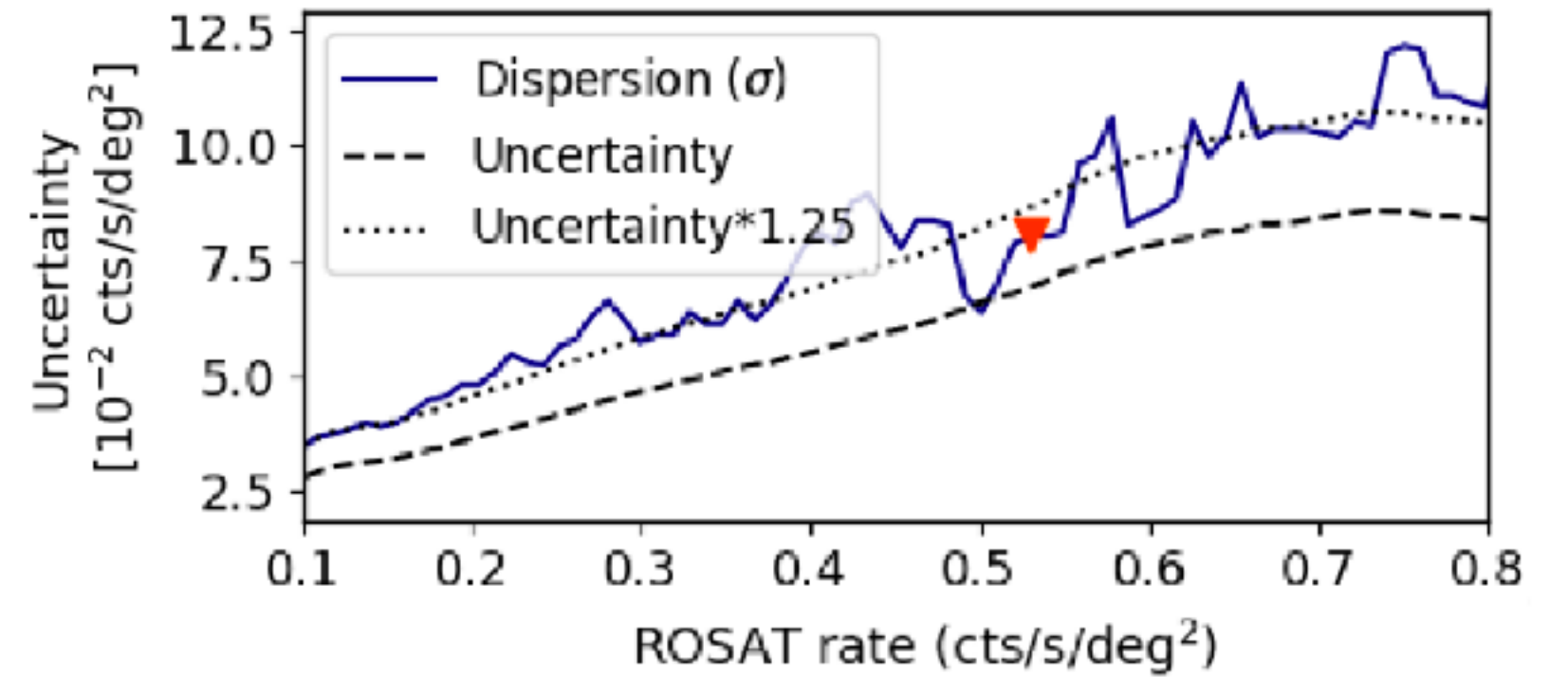
ROSAT R4 band:



X. Zheng, et al. 2023 submitted

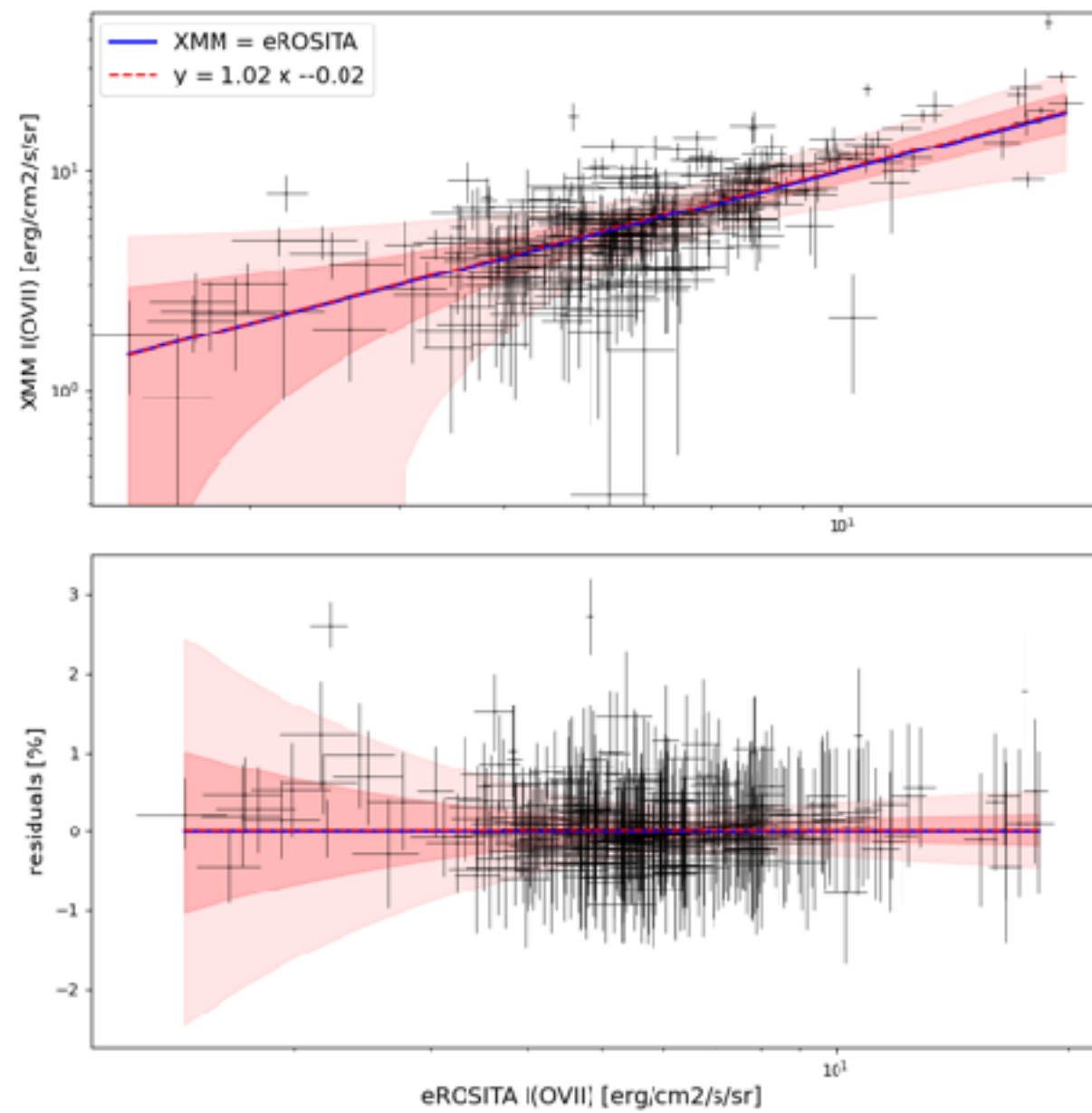


- Good consistency found between eROSITA and ROSAT
- Scattering within 1.25 sigma

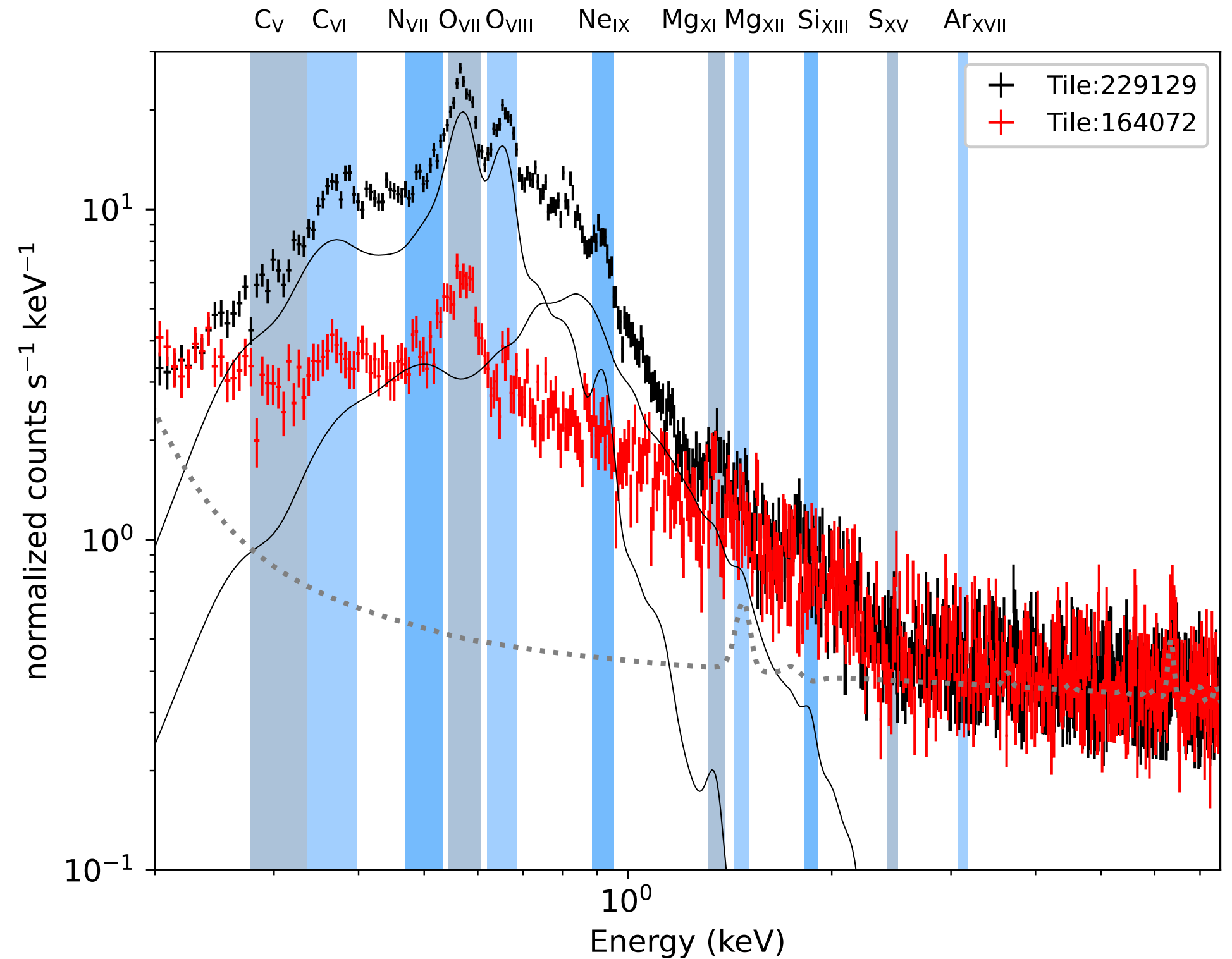


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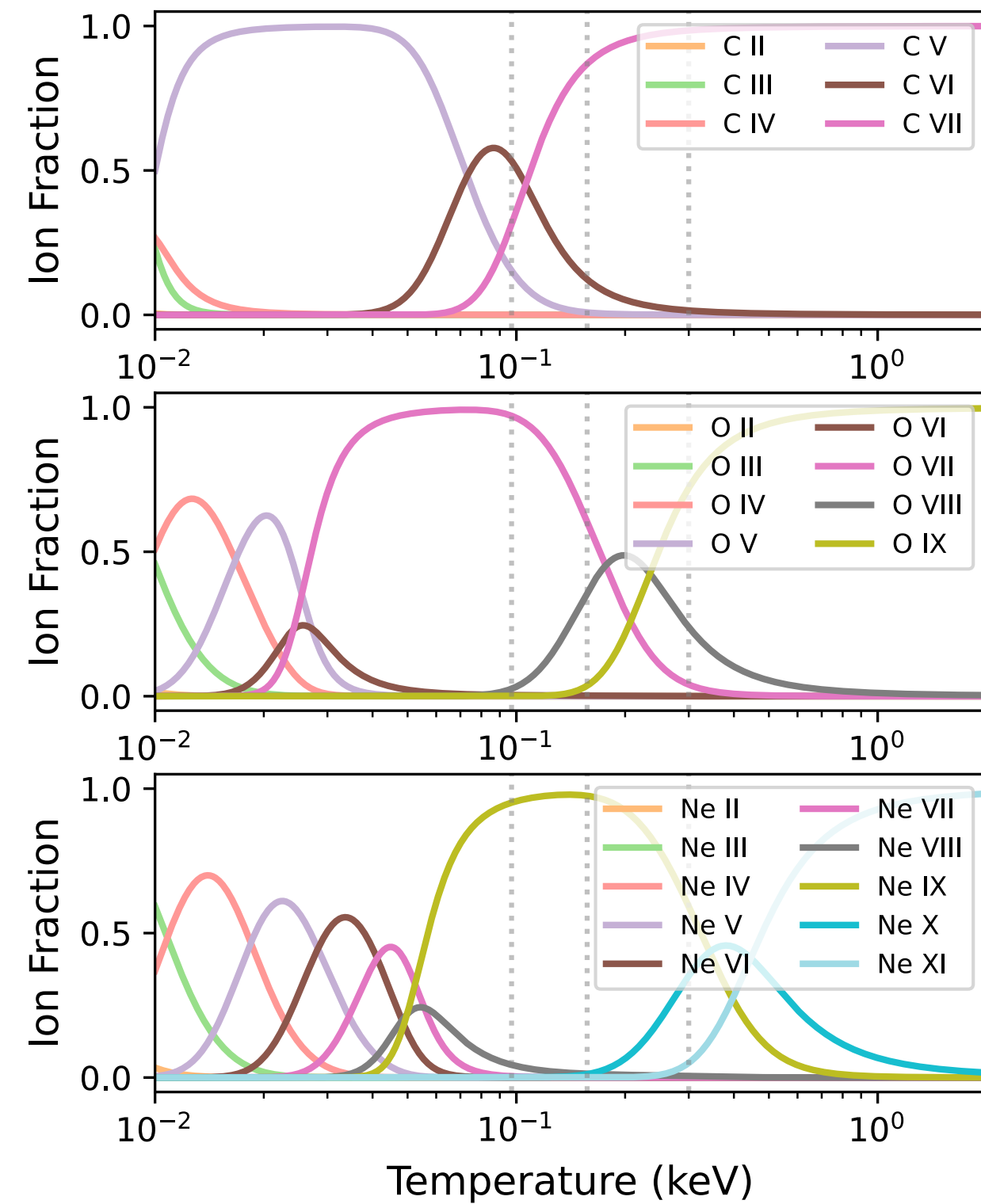
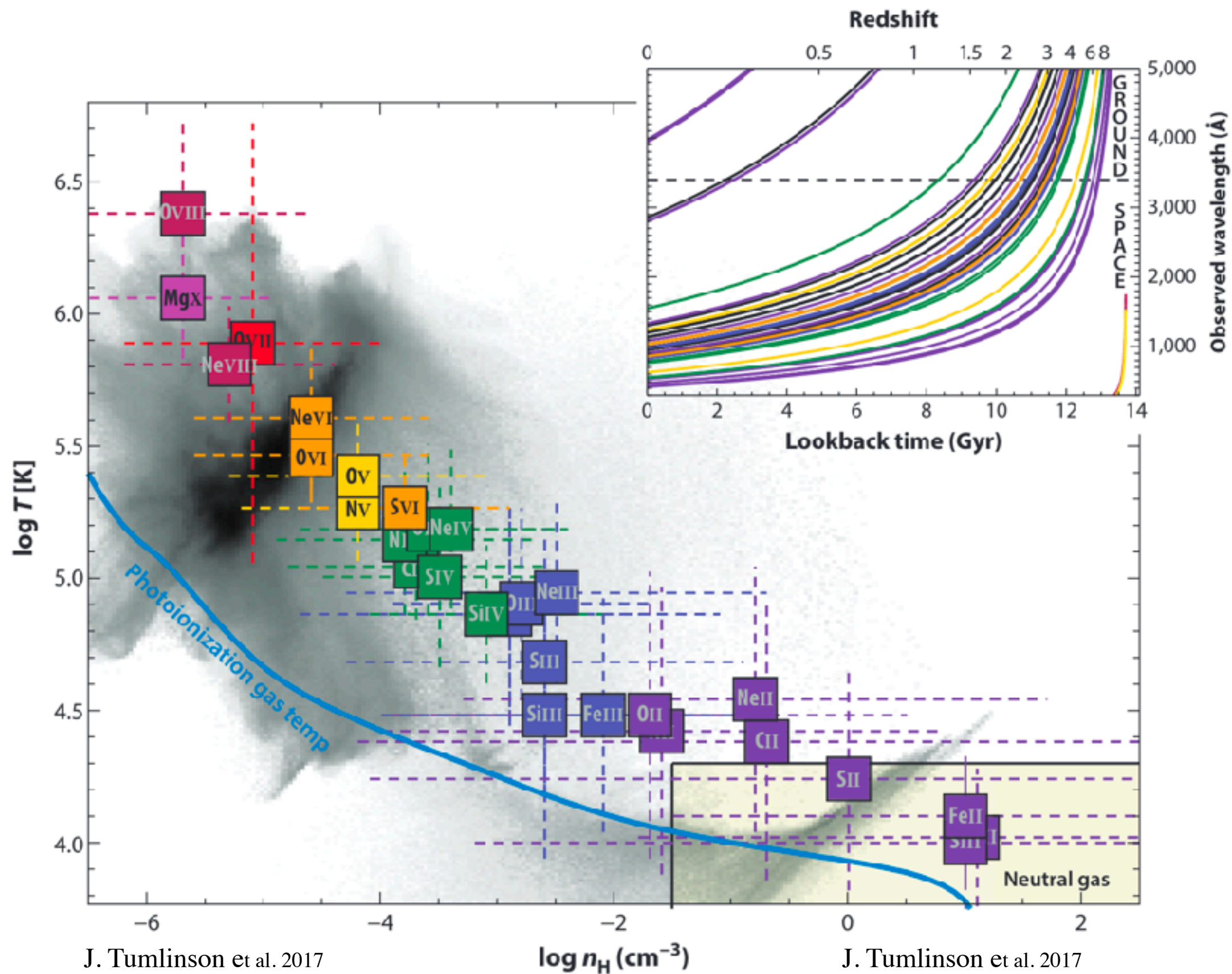
- To produce the first maps of the soft X-ray line emission as seen by SRG/eROSITA



Credit by N. Locatelli



constraining CGM gas properties with these multiphase ions

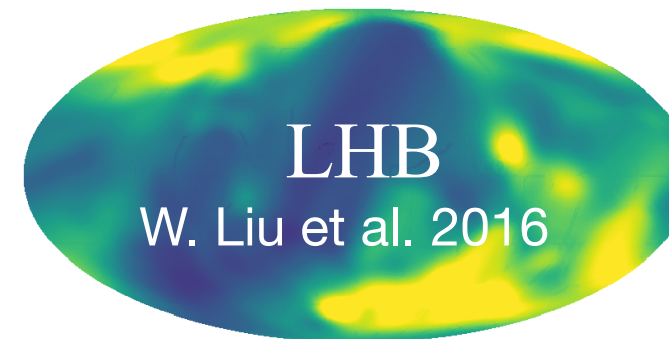
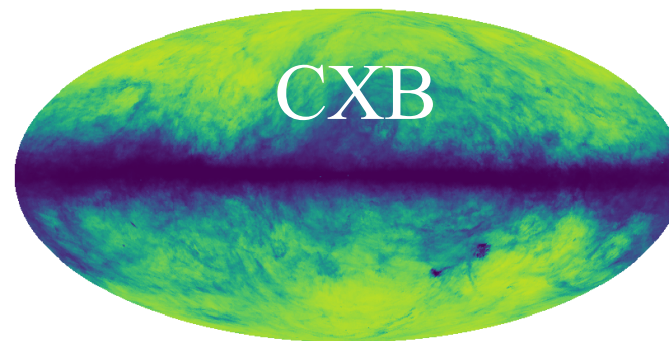
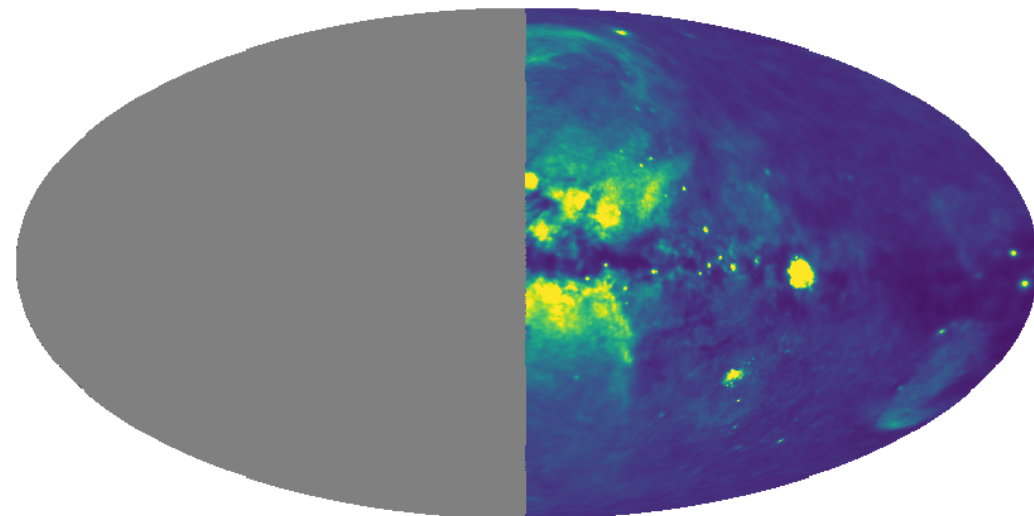


J. Tumlinson et al. 2017

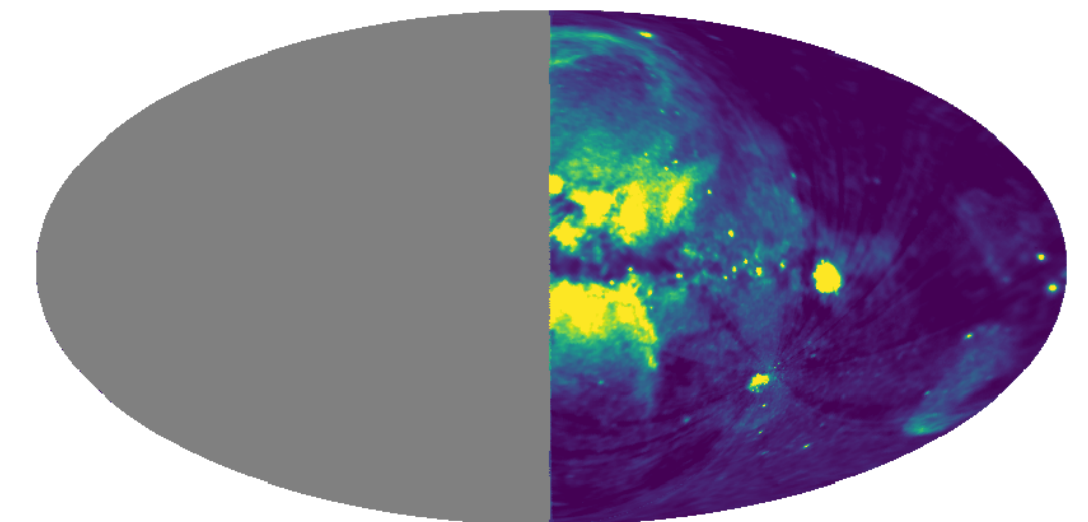
J. Tumlinson et al. 2017

Data processing: Untangle the components

The original O7 map



The preliminarily cleaned O7 map



More information would be added after correcting for the SWCX

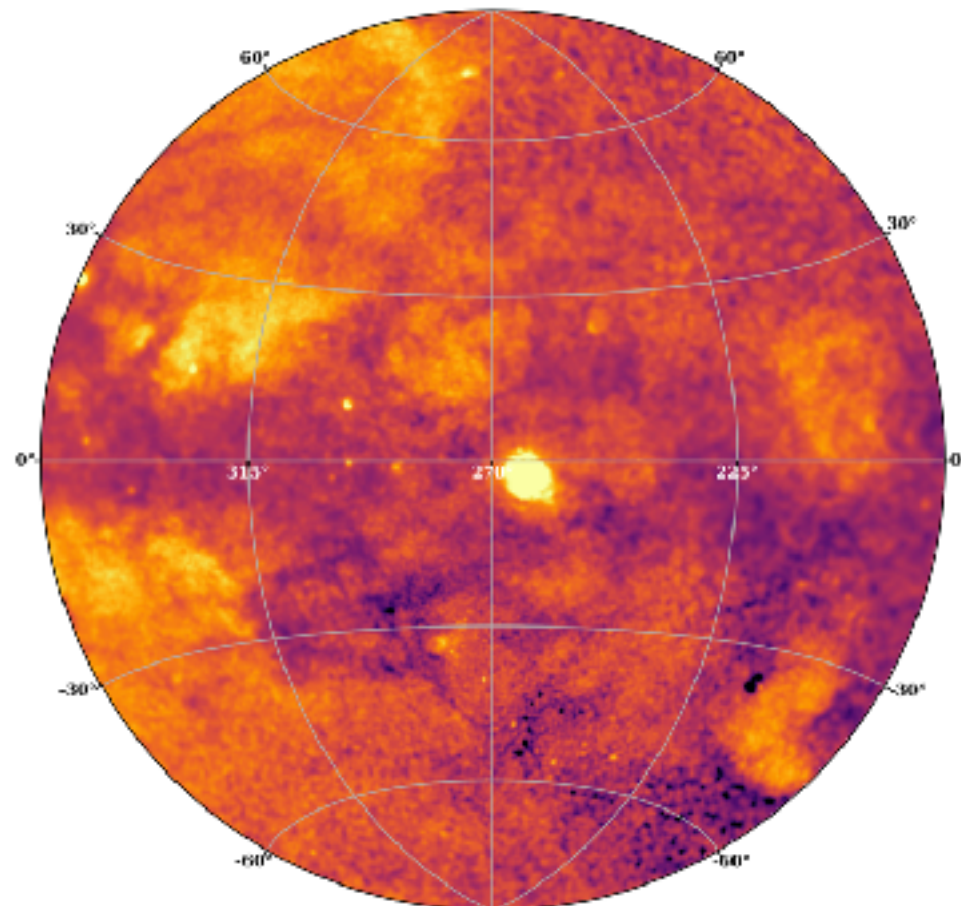
Point sources + cluster candidates

Emission line maps@eRASS1

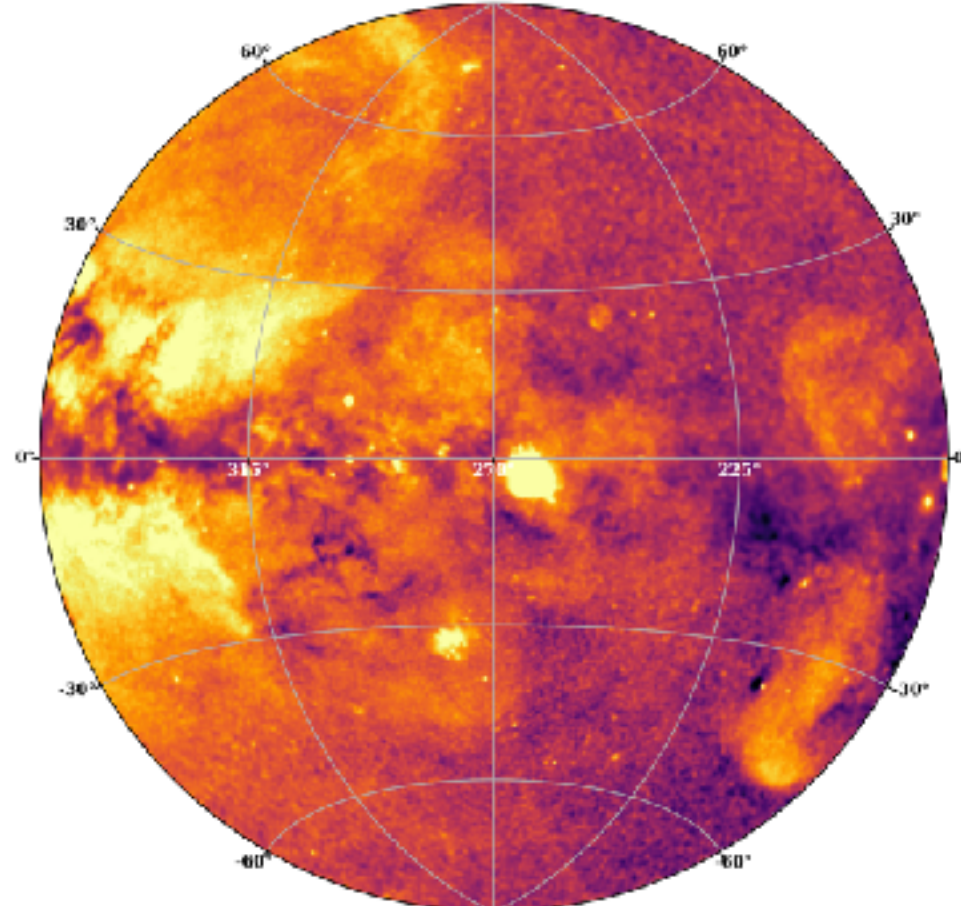
- HealPix
- CXB, LHB removed
- Bright Point sources removed



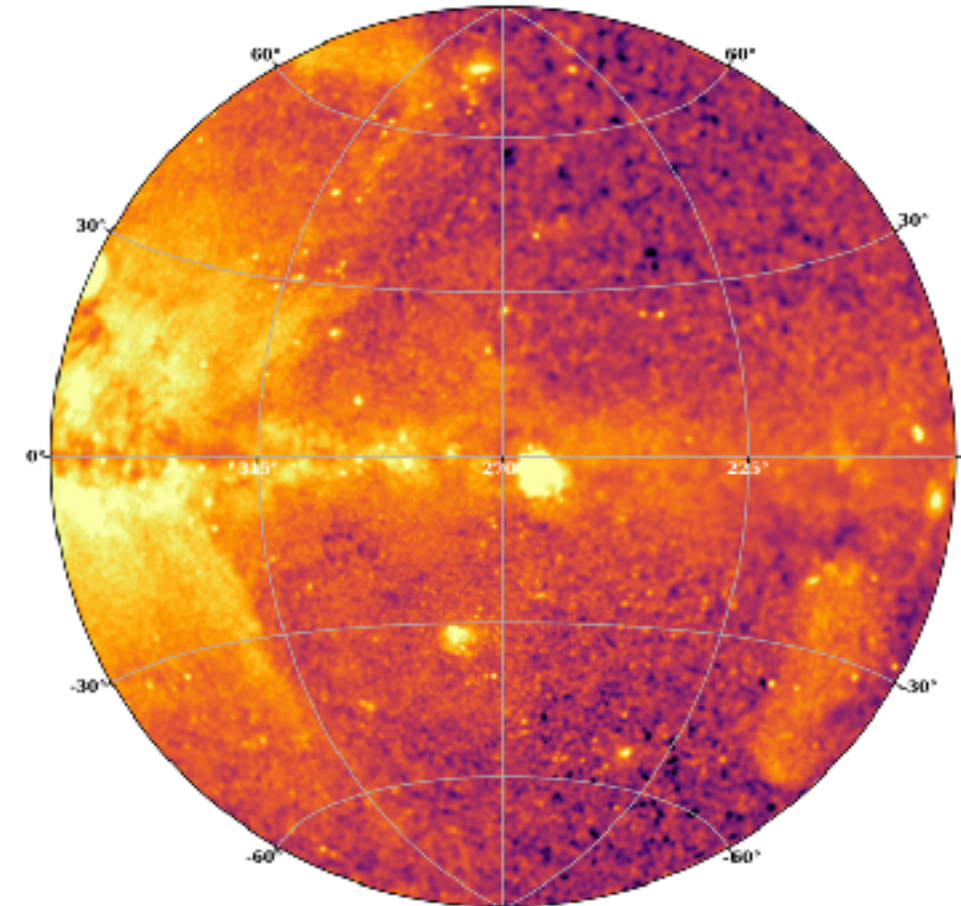
C V (0.277-0.339 keV)



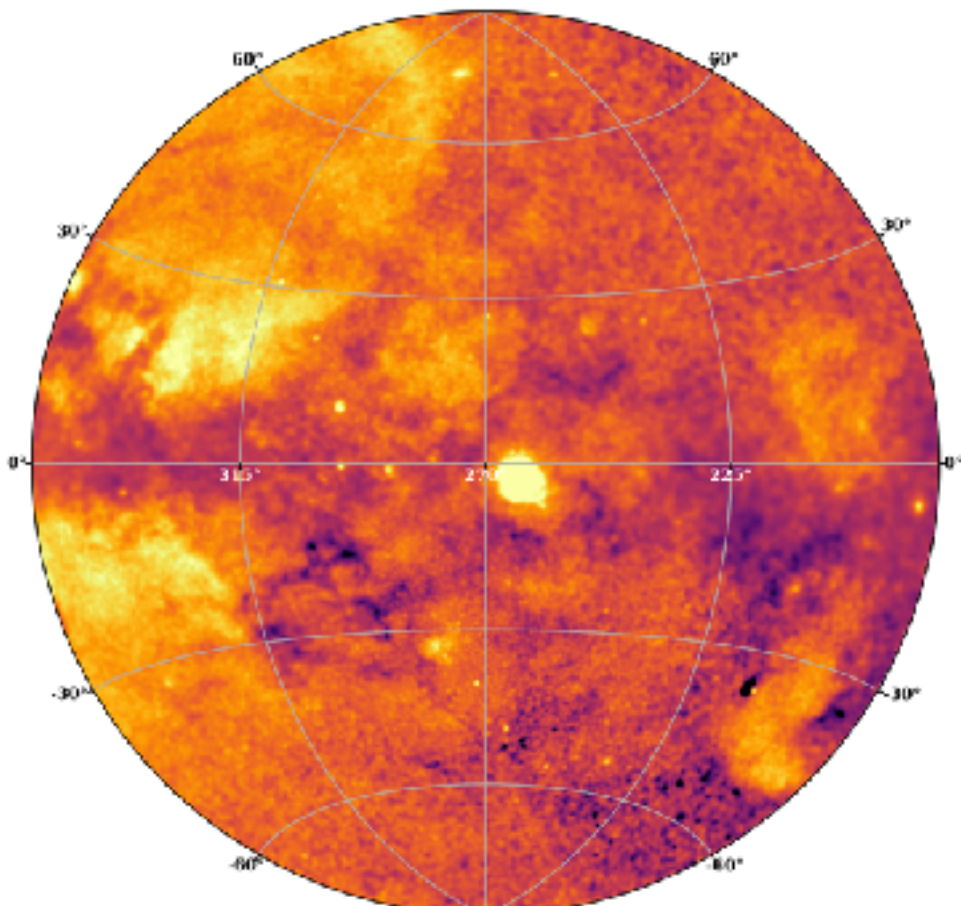
O VII (0.534-0.614 keV)



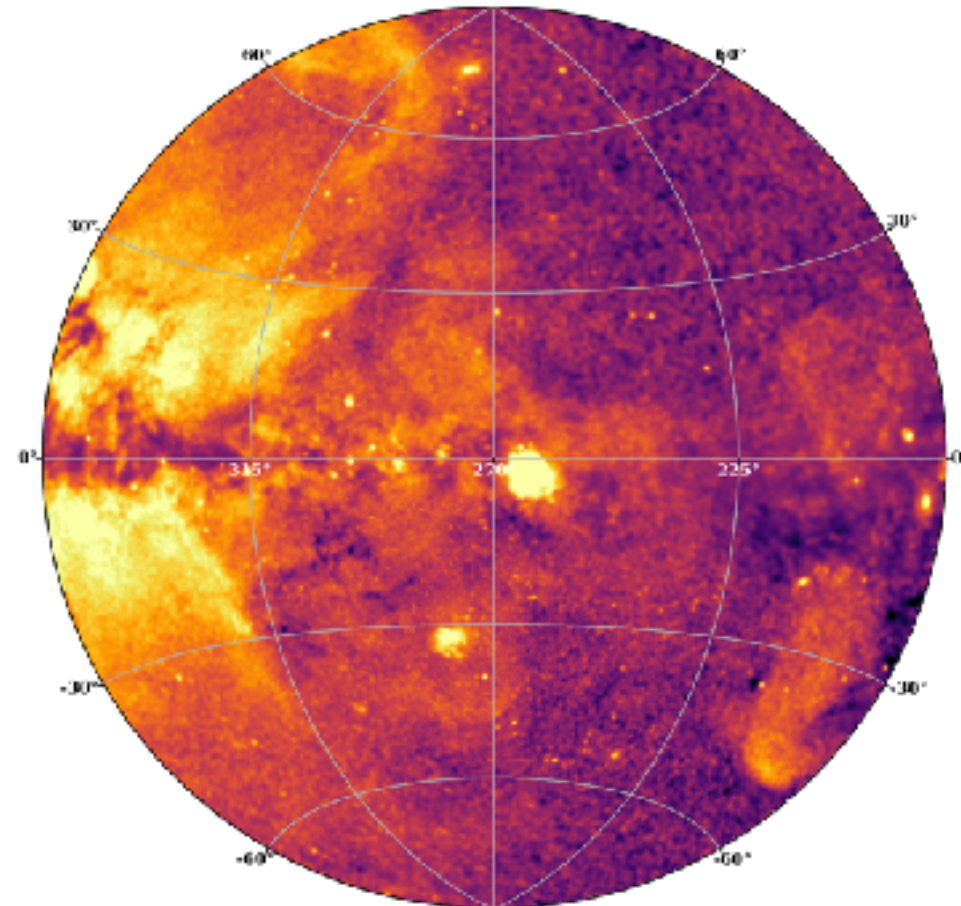
Ne IX (0.879-0.947 keV)



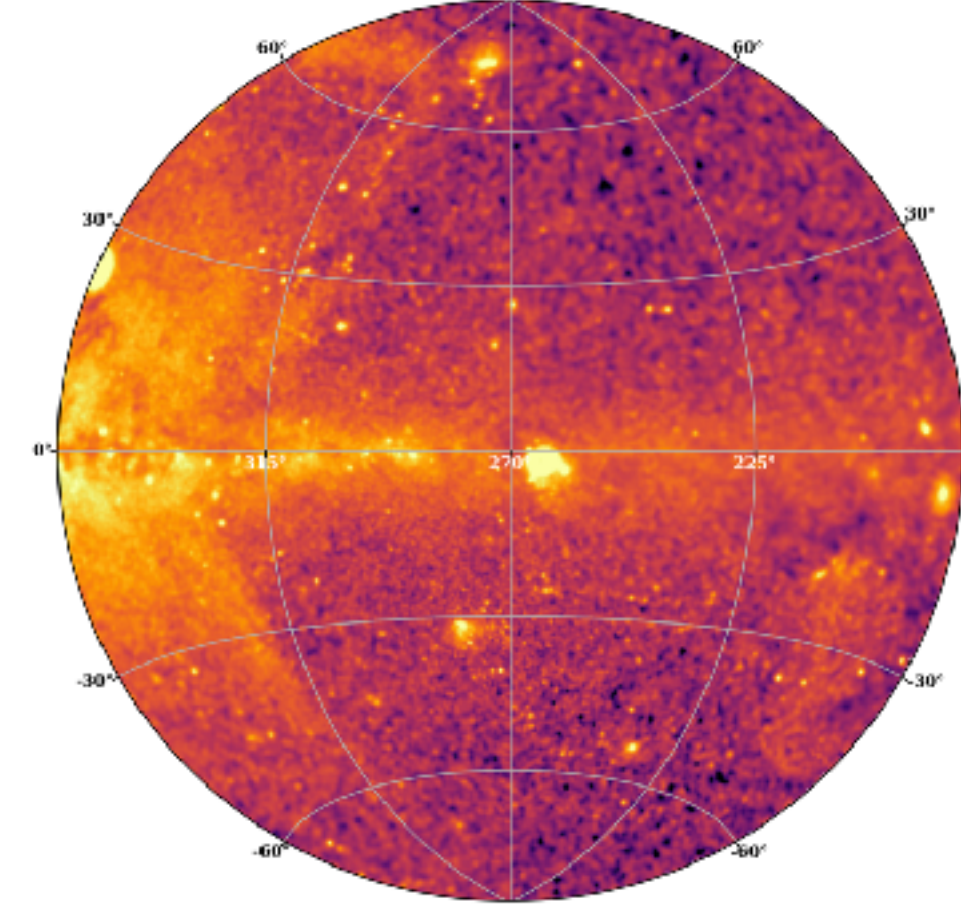
C VI (0.336-0.398 keV)



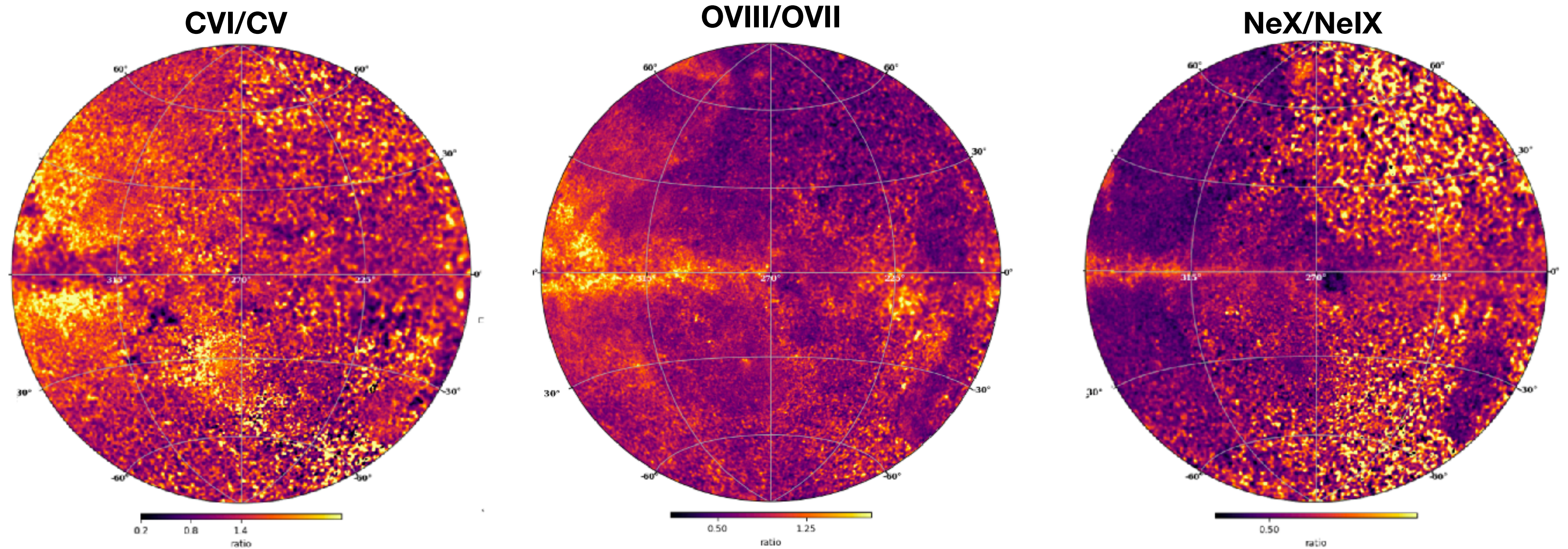
O VIII (0.614-0.694 keV)



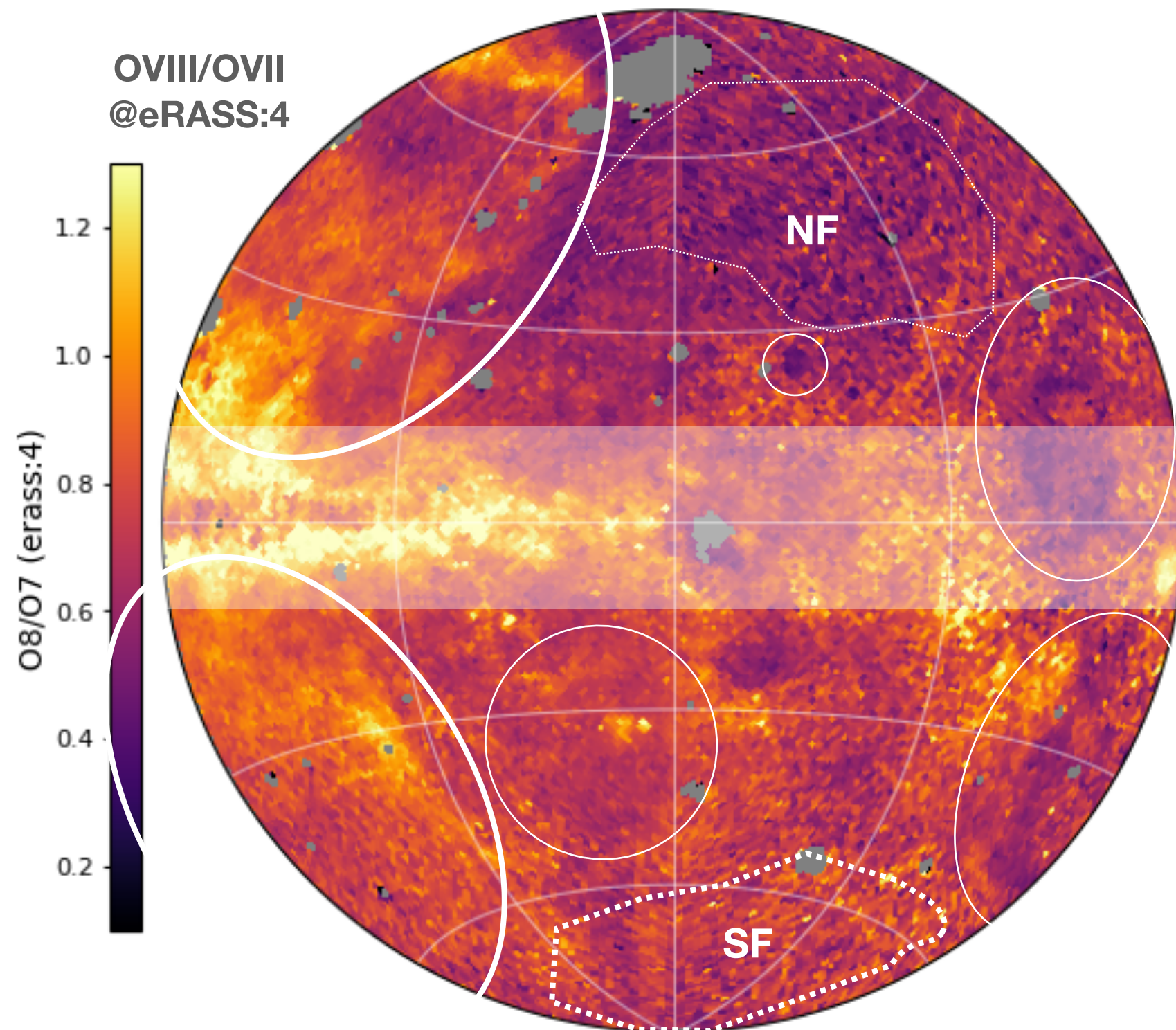
Ne X (0.987-1.056 keV)



- To produce the first **RATIO** maps of the soft X-ray line emission as seen by SRG/eROSITA

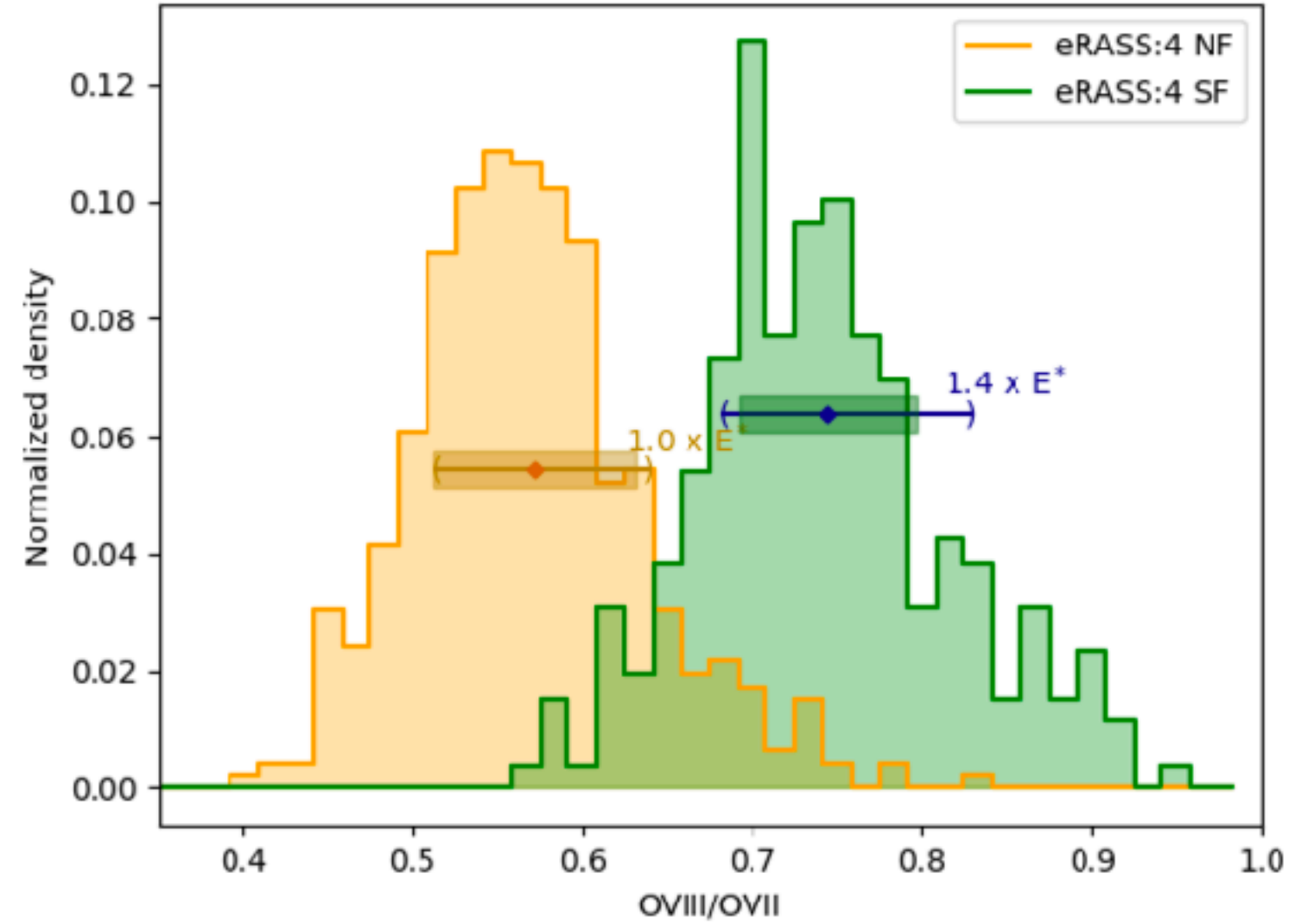


Northern vs southern



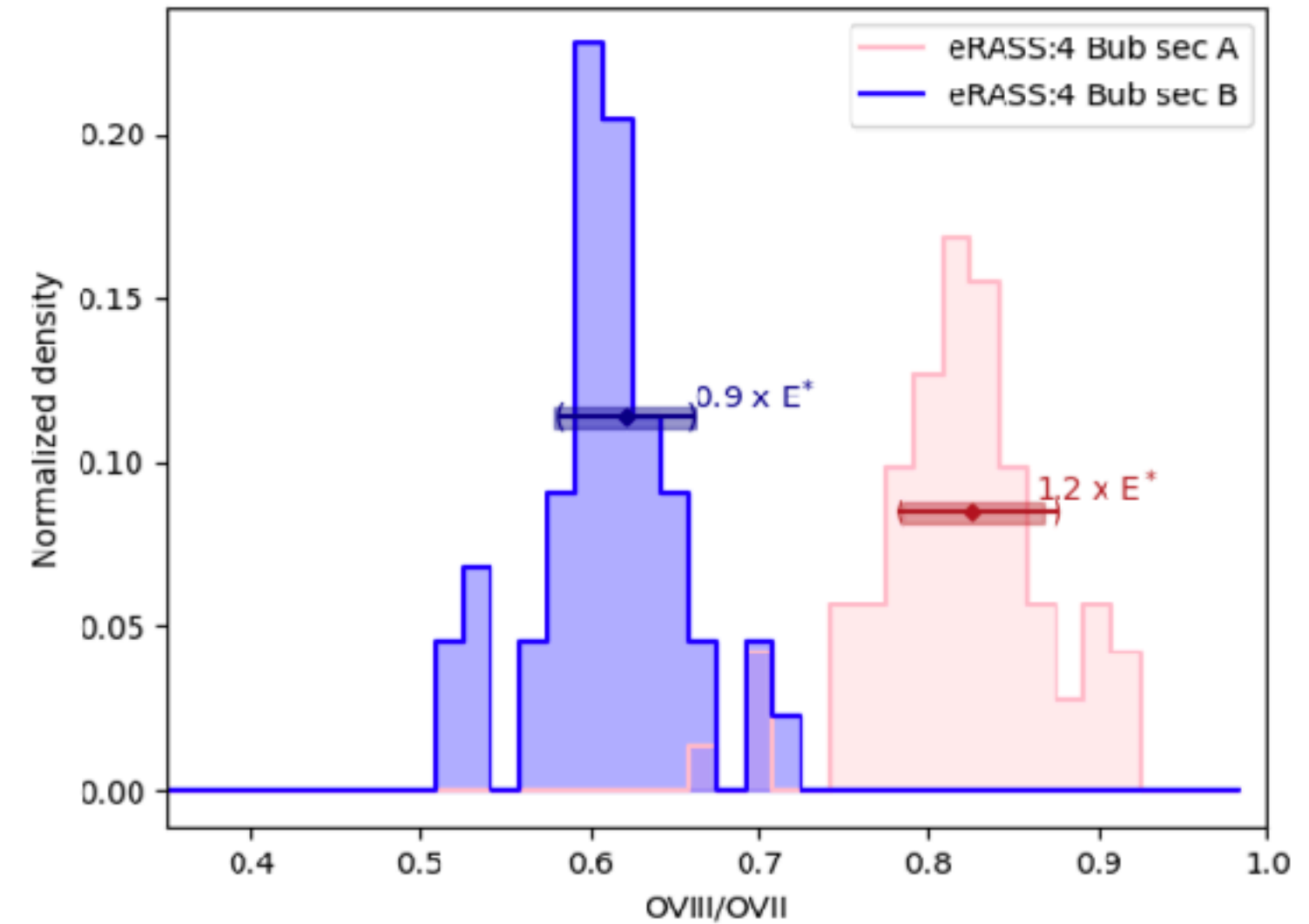
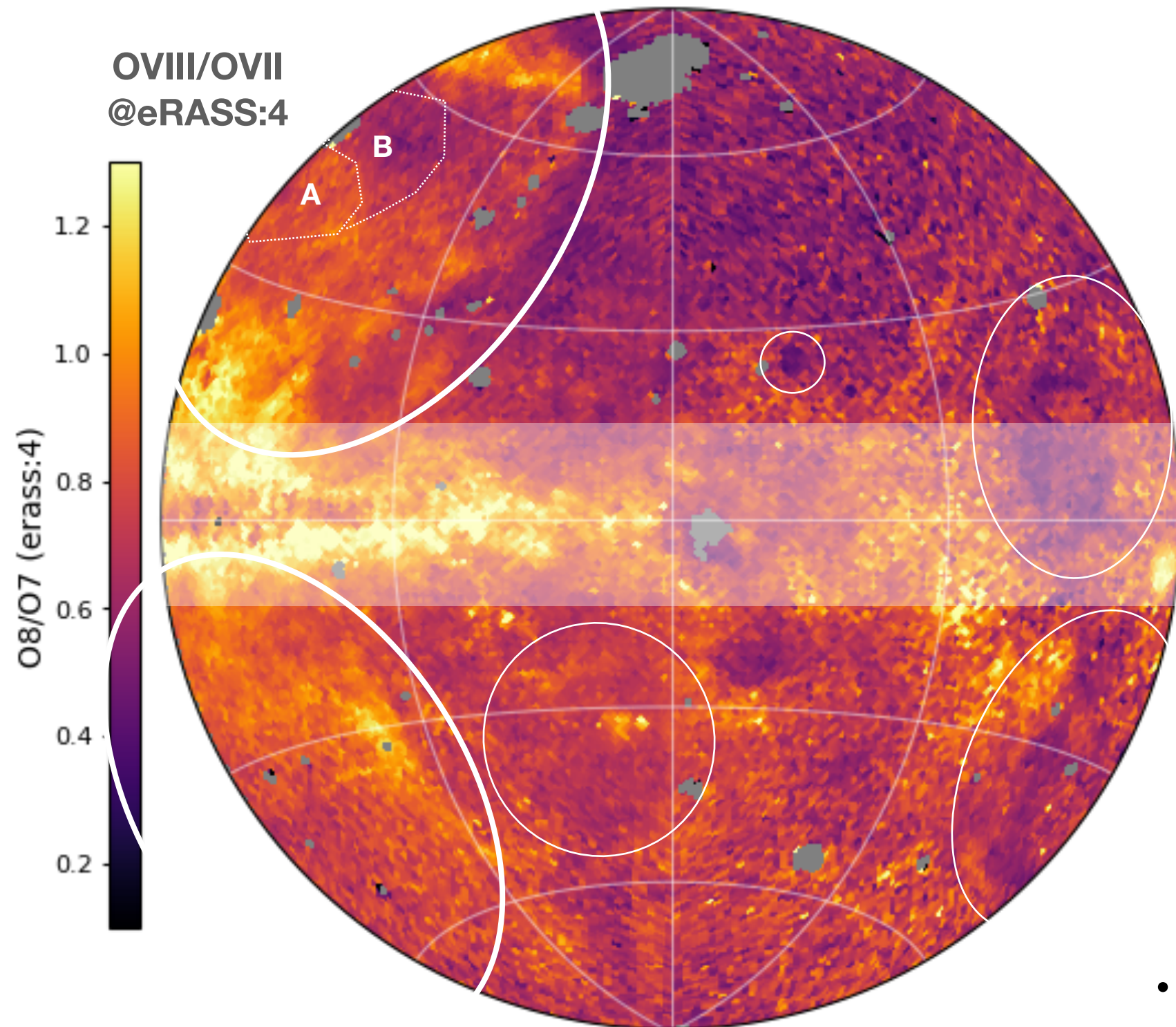
See G. Ponti et al. A&A 670, A99 (2023)

E^* : joint error of E_{obs} and E_{abs}



- The O VIII/O VII ratio in NF and SF region are **different**
- The fluctuation in NF region could be explained by foreground absorption
- **Residual fluctuation remains in SF**

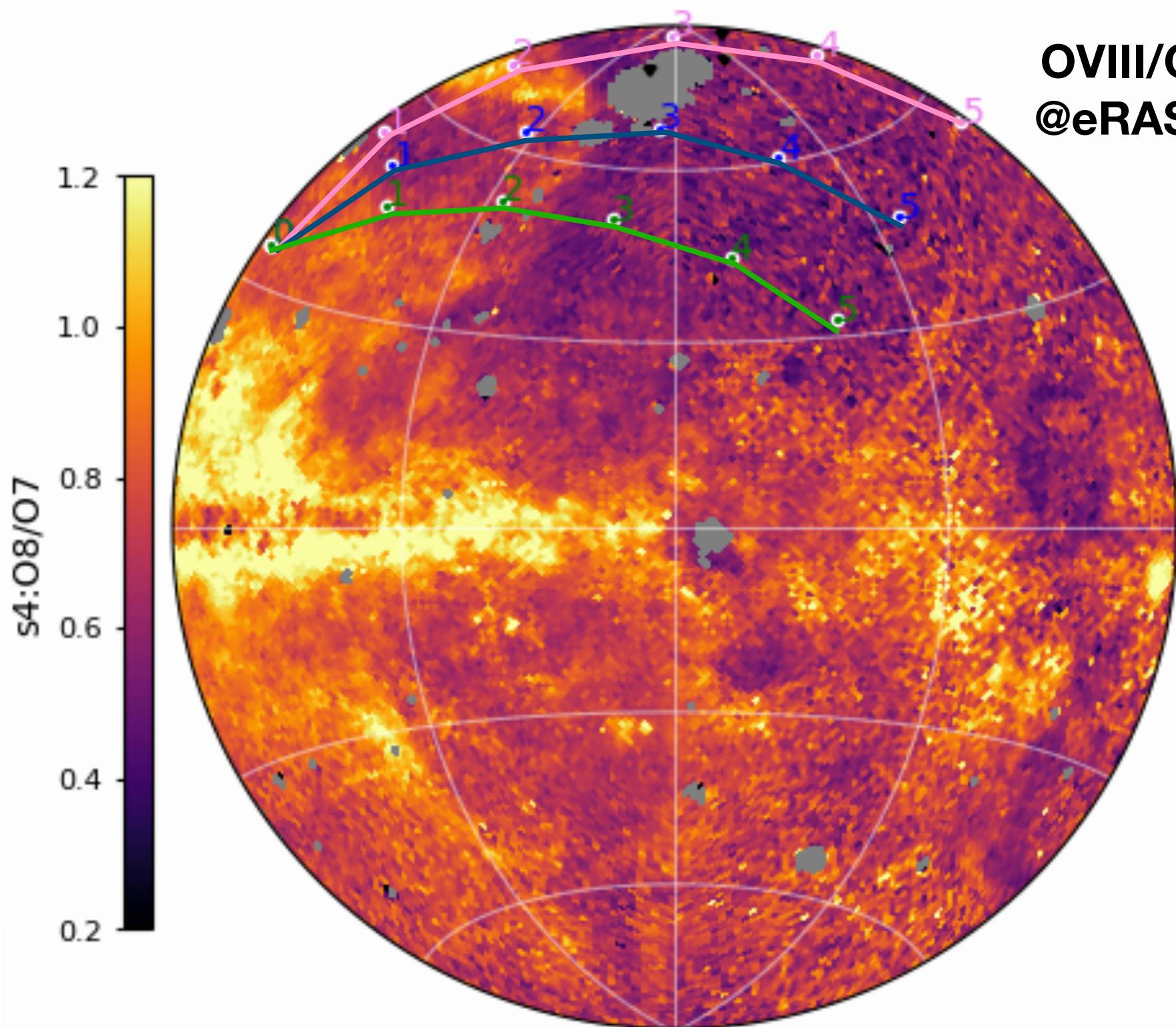
Bi-peak inside ero-Bubbles



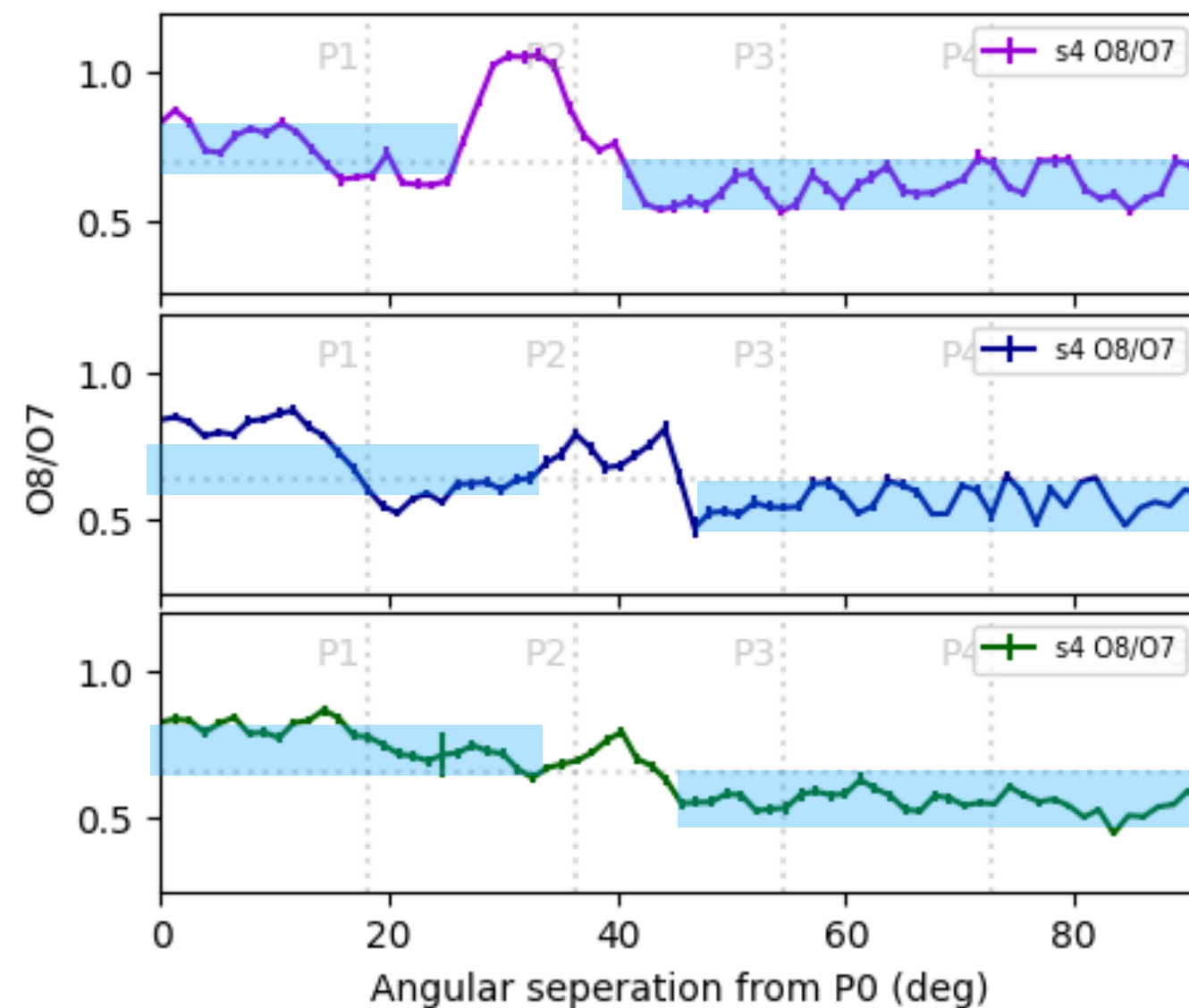
- The OVIII/OVII ratio in Sec A and B region are **distinctly different**
- The fluctuation in both region could largely be explained by absorption

See G. Ponti et al. A&A 670, A99 (2023)

Ratio transition across the eROSITA Bubbles



OVIII/OVII
@eRASS:4



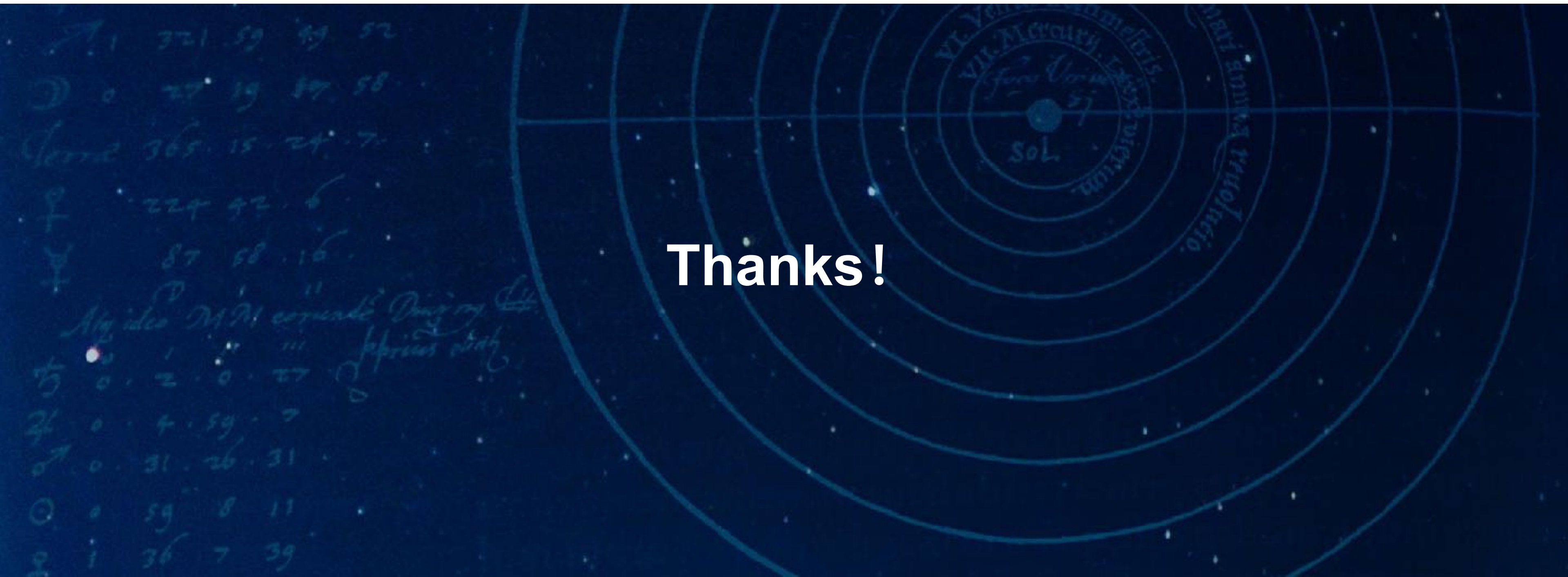
- The OVIII/OVII ratio peaks at (or close to) the edge of bubble
- The inner-Bubble region is generally high in ratio than the outside regions

Summary

- **Broadband:** Map the X-ray diffuse emission for eROSITA/eRASS1 in broad band
- Result in consistency in both morphology and flux level is found between eROSITA and ROSAT
- **Line emission:** First time line emission map of X-ray diffuse emission
- The ratio difference in the Northern/Southern Free region and ero-Bubble inner regions.
- The broadening is strongly related to absorption except for SF region.
- Oxygen ratio shows transition across the eROSITA Bubble ---> indicates of temperature changes?

Thanks!





Thanks!