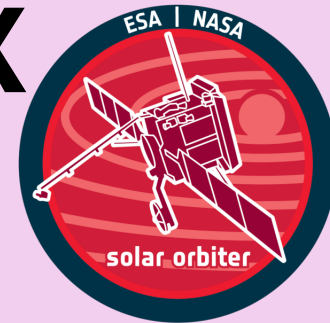




Observing a solar flare from two perspectives: First MeDDEA–STIX results

Muriel Zoë Stiefel^{1,2}

Säm Krucker¹, Olivier Limousin³, Niharika Godbole^{4,5}, Gwendoline Marc³,
Steven Christe⁴

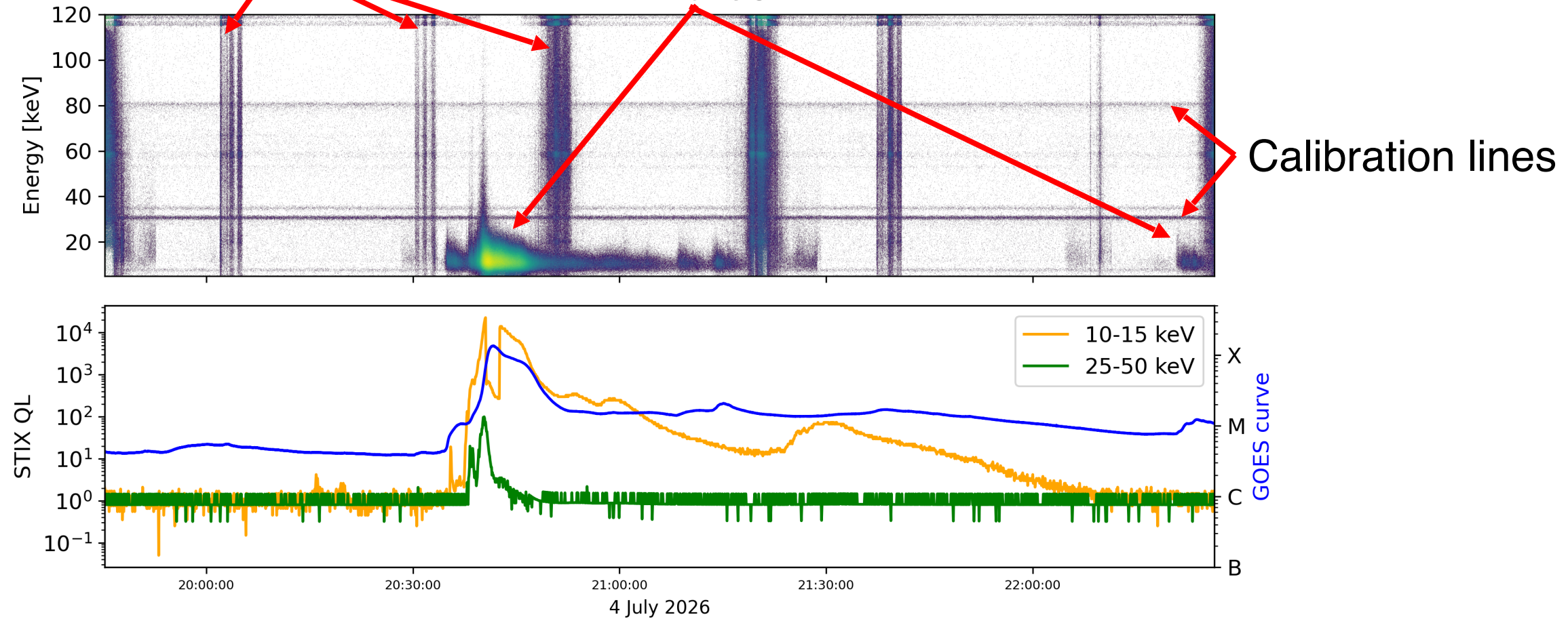
And the PADRE team

1 FHNW, 2 ETHZ, 3 CEA, 4 GSFC, 5 AU

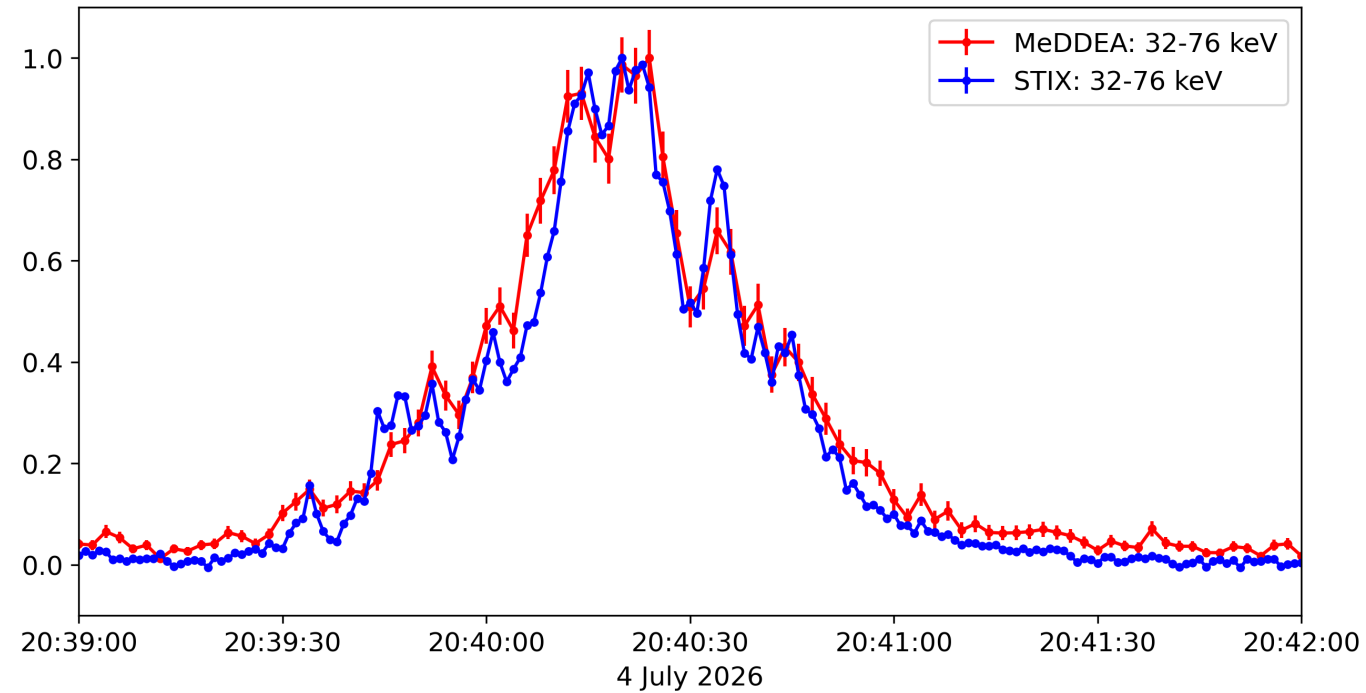
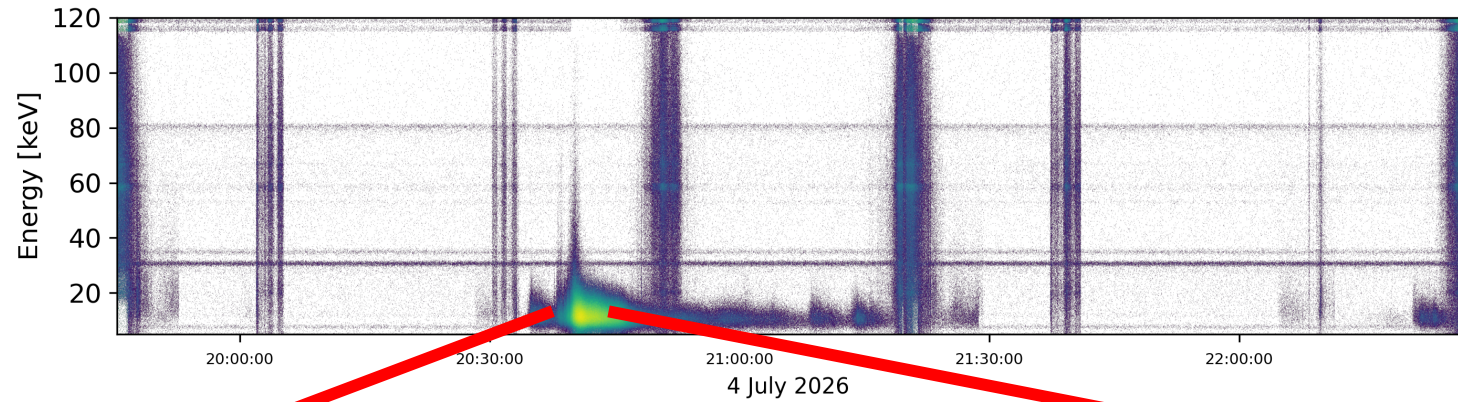
MeDDEA data

- Photon list
- Energy range: 5-100 keV

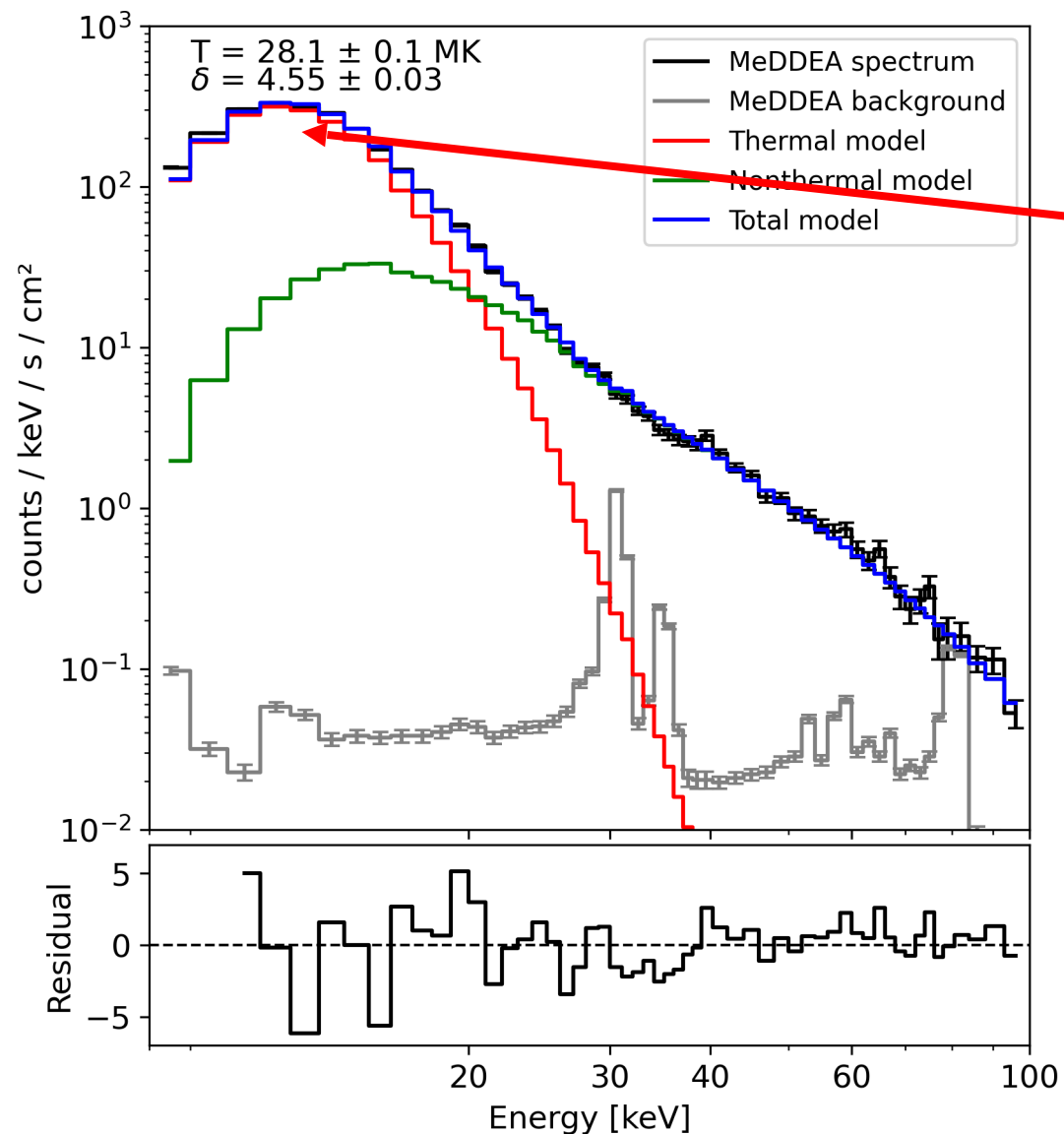
Electron belts (south & northern), here no SAA
Flares



MeDDEA data



Spectral analysis: sunkit-spex

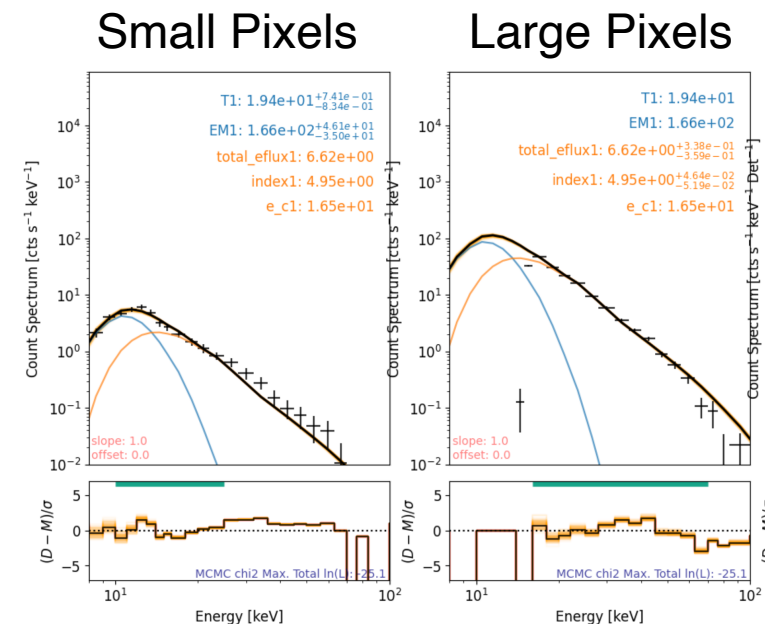


Spectrum at nonthermal peak of X1 on 4.07.2026

AI-filter: turn-over at around 11 keV

Fitting done in sunkit-spex: thermal & nonthermal

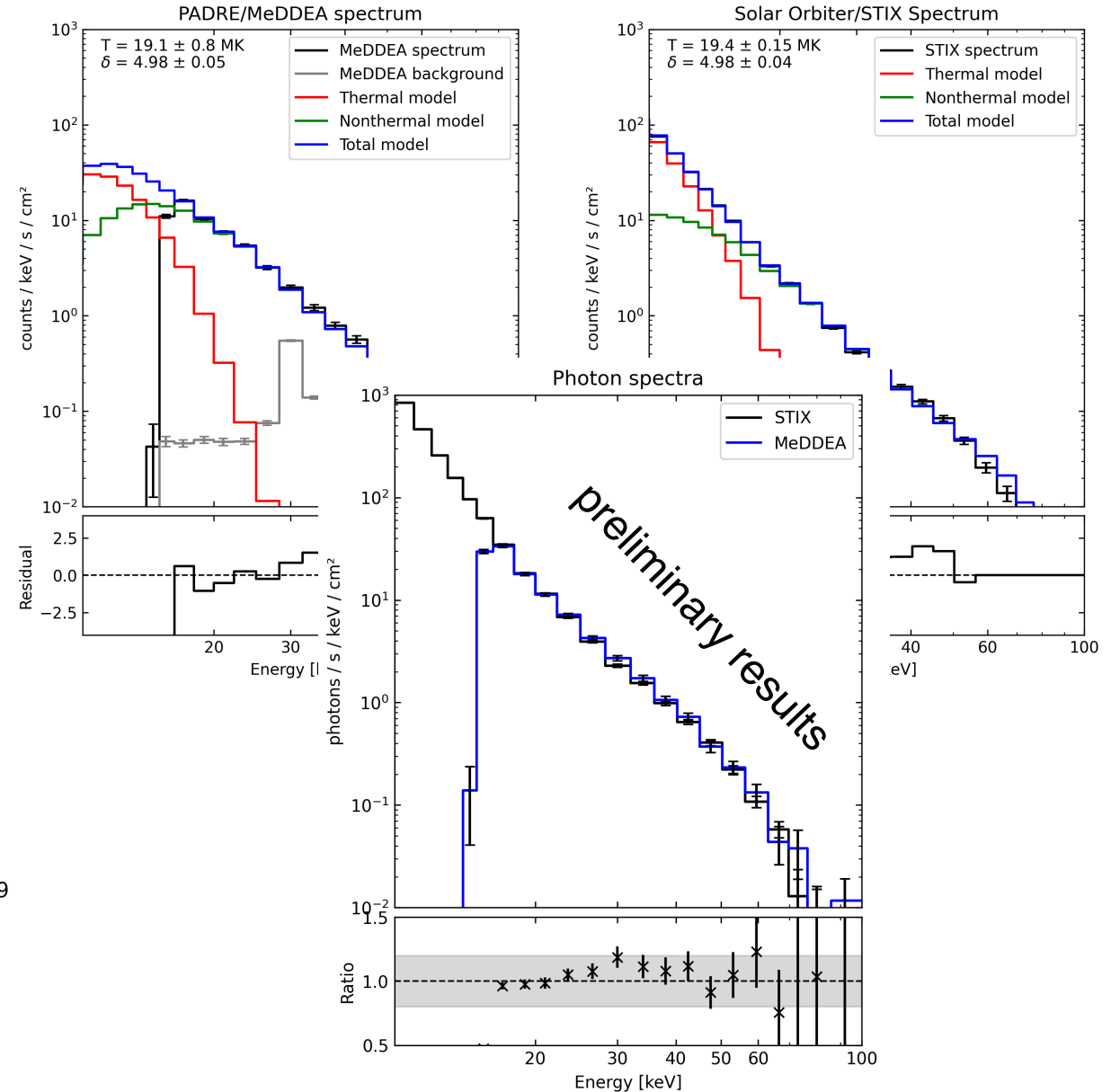
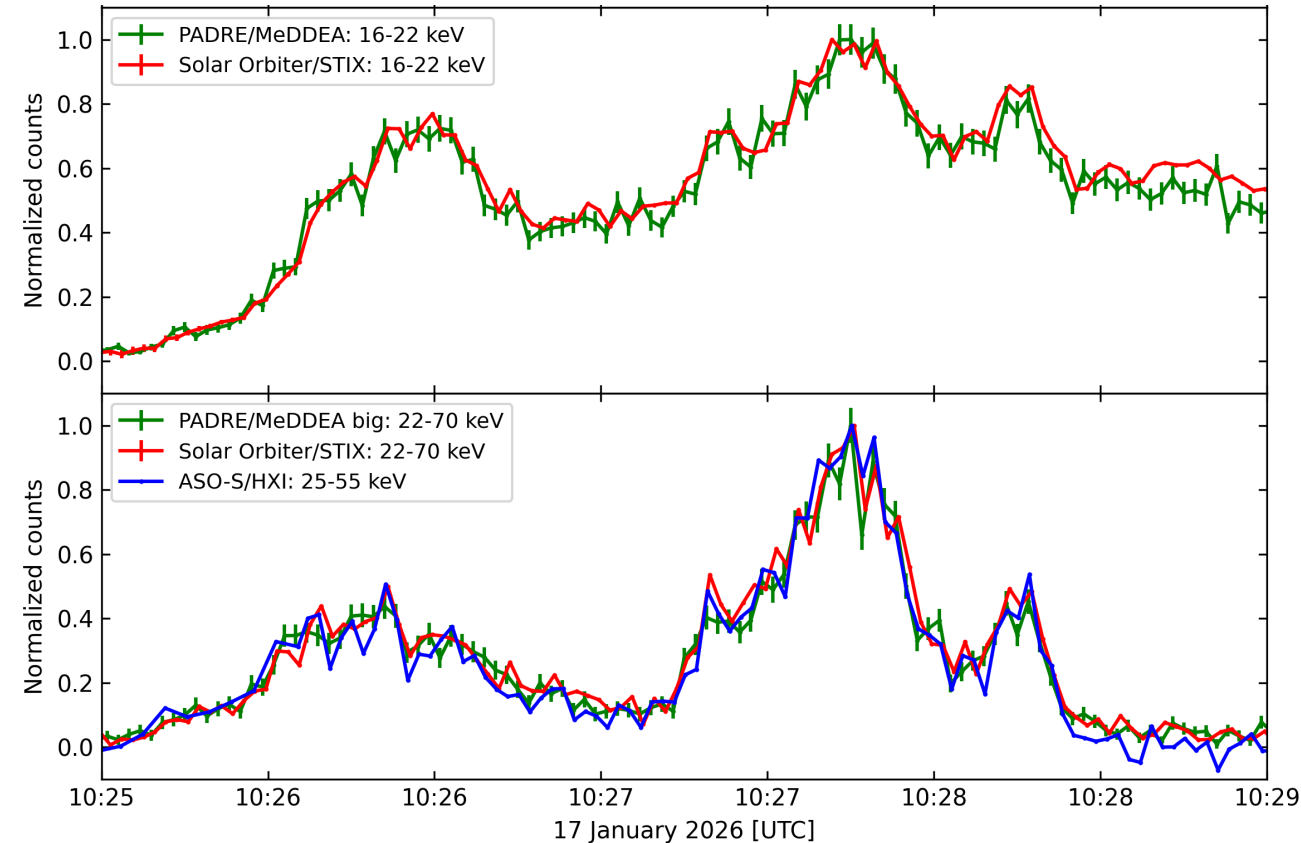
Different thresholds in the pixels: joint fit between small & large pixels



Preliminary fit!

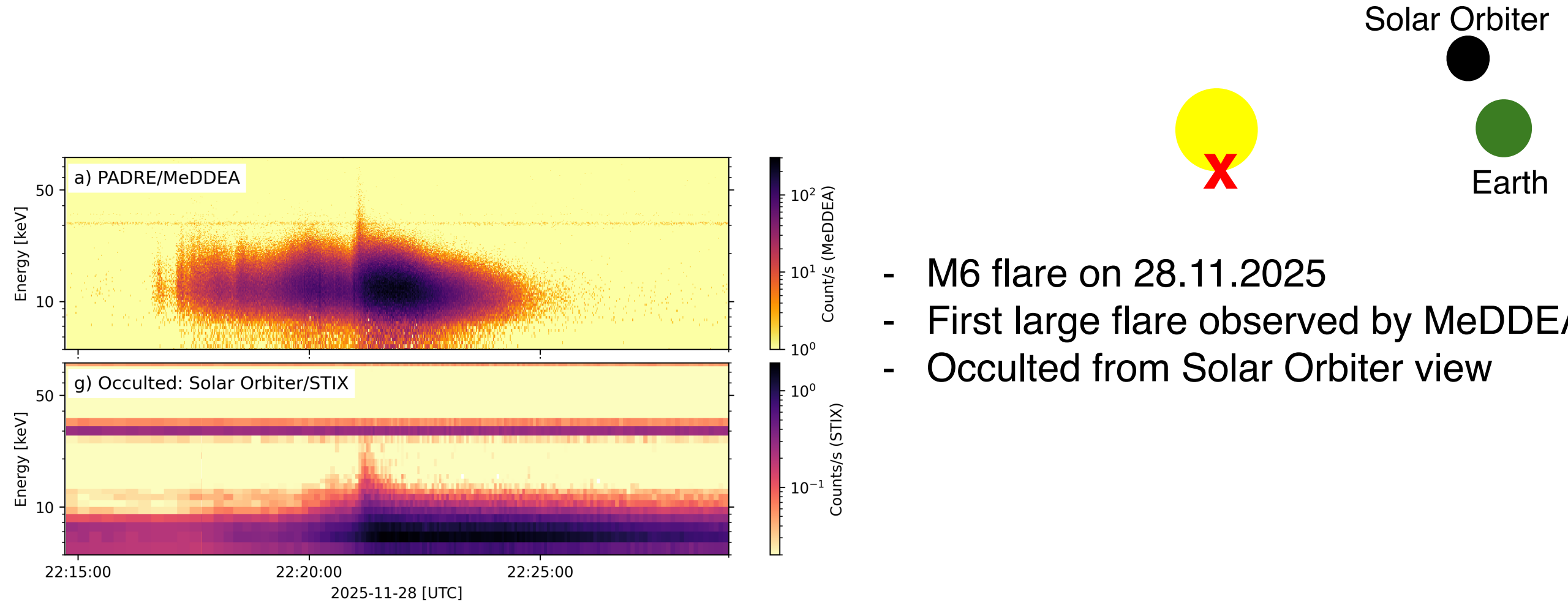
First comparison MeDDEA & STIX

M2 flare on 17 January 2026



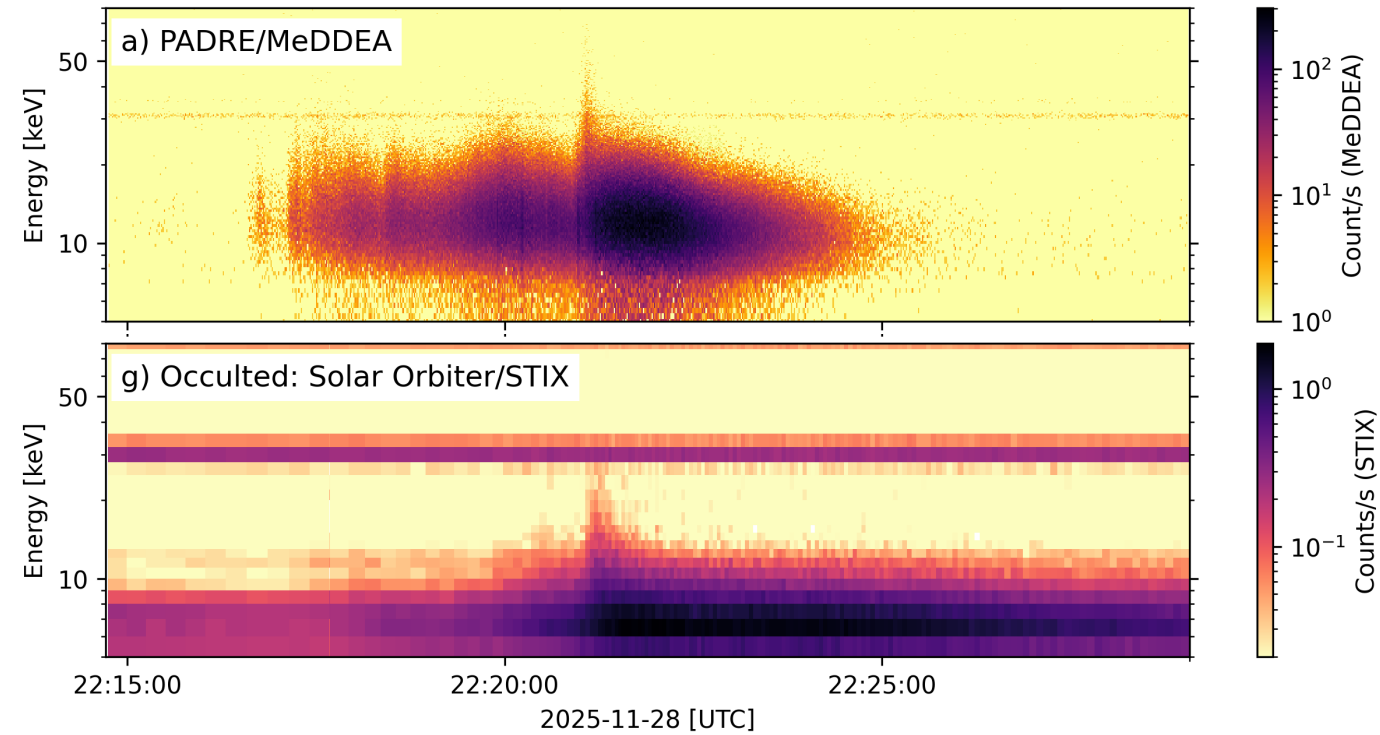
Ongoing work; preliminary results!

HXR from the high corona: study of an M6 flare

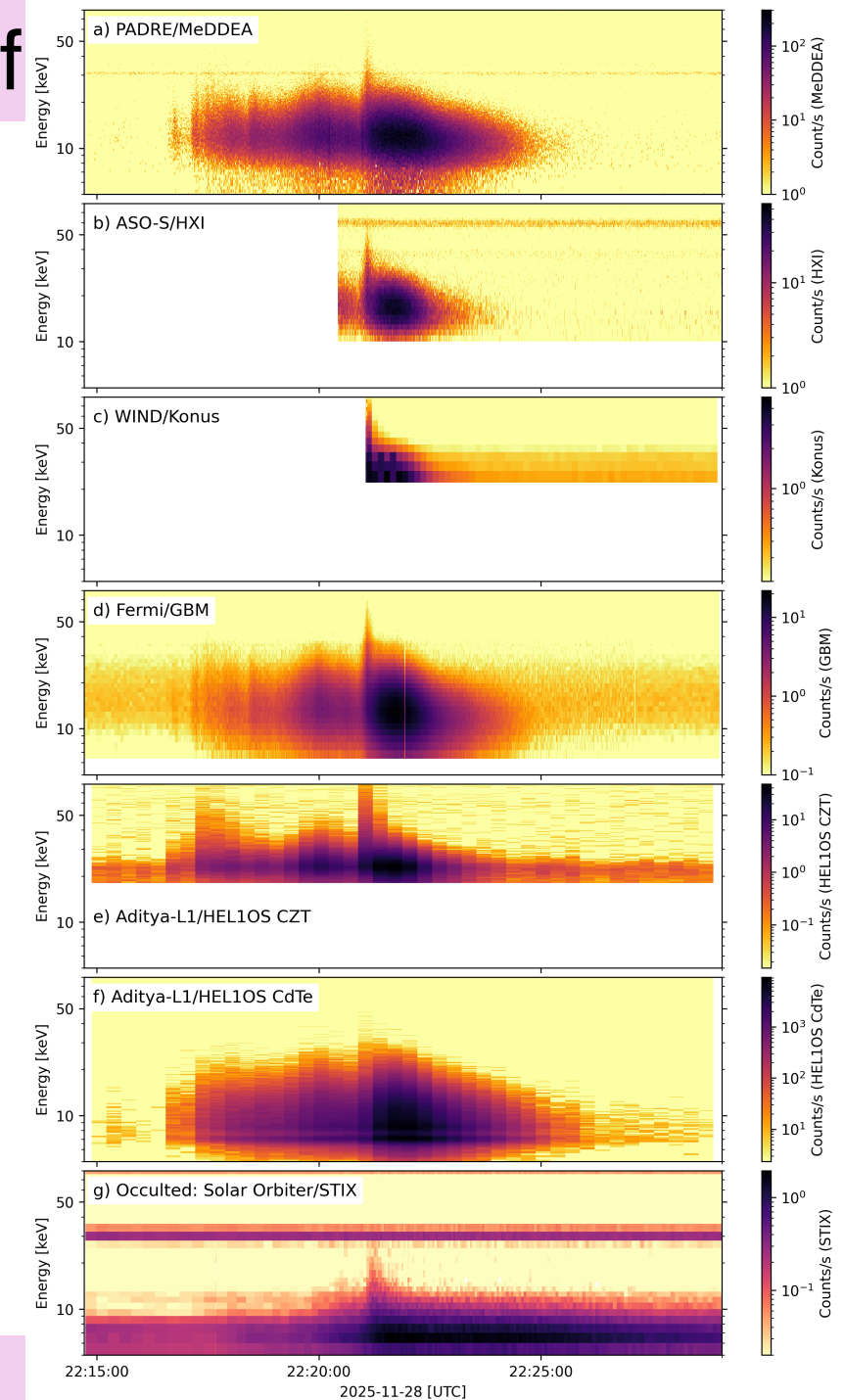


Stiefel et al. (2026), in prep.

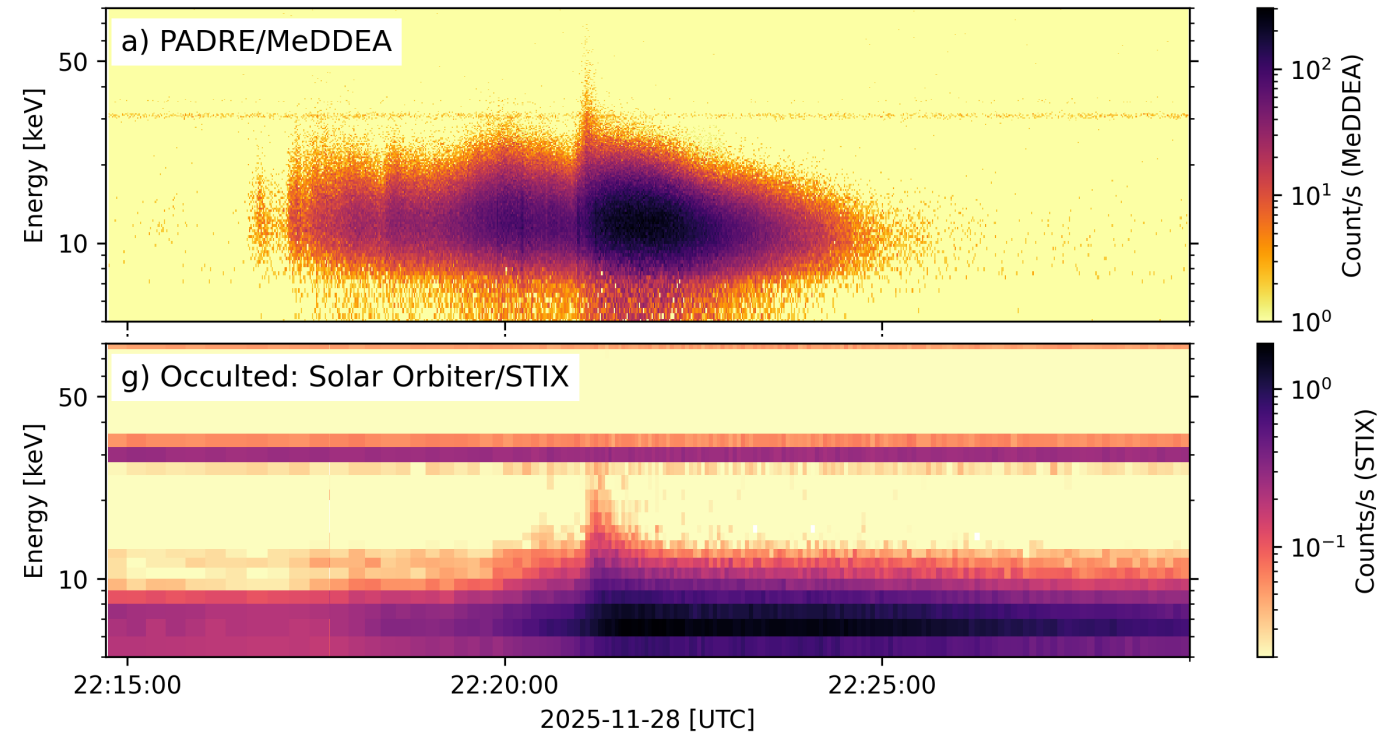
HXR from the high corona: study of



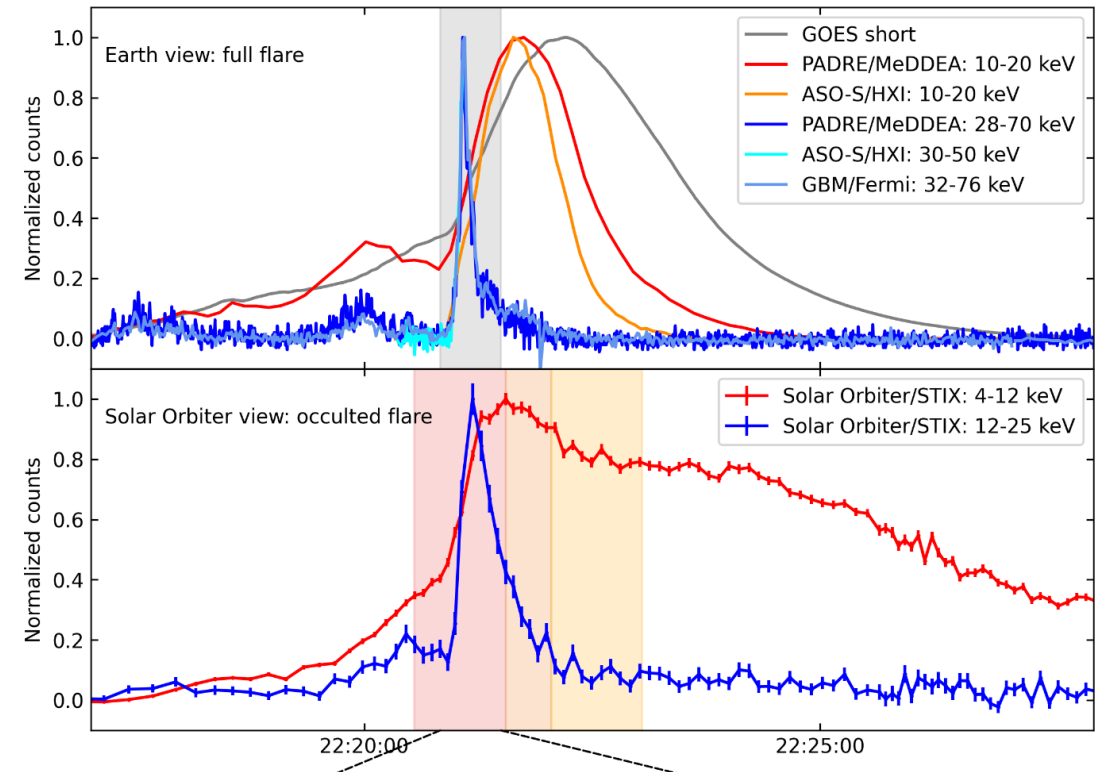
Stiefel et al. (2026), in prep.



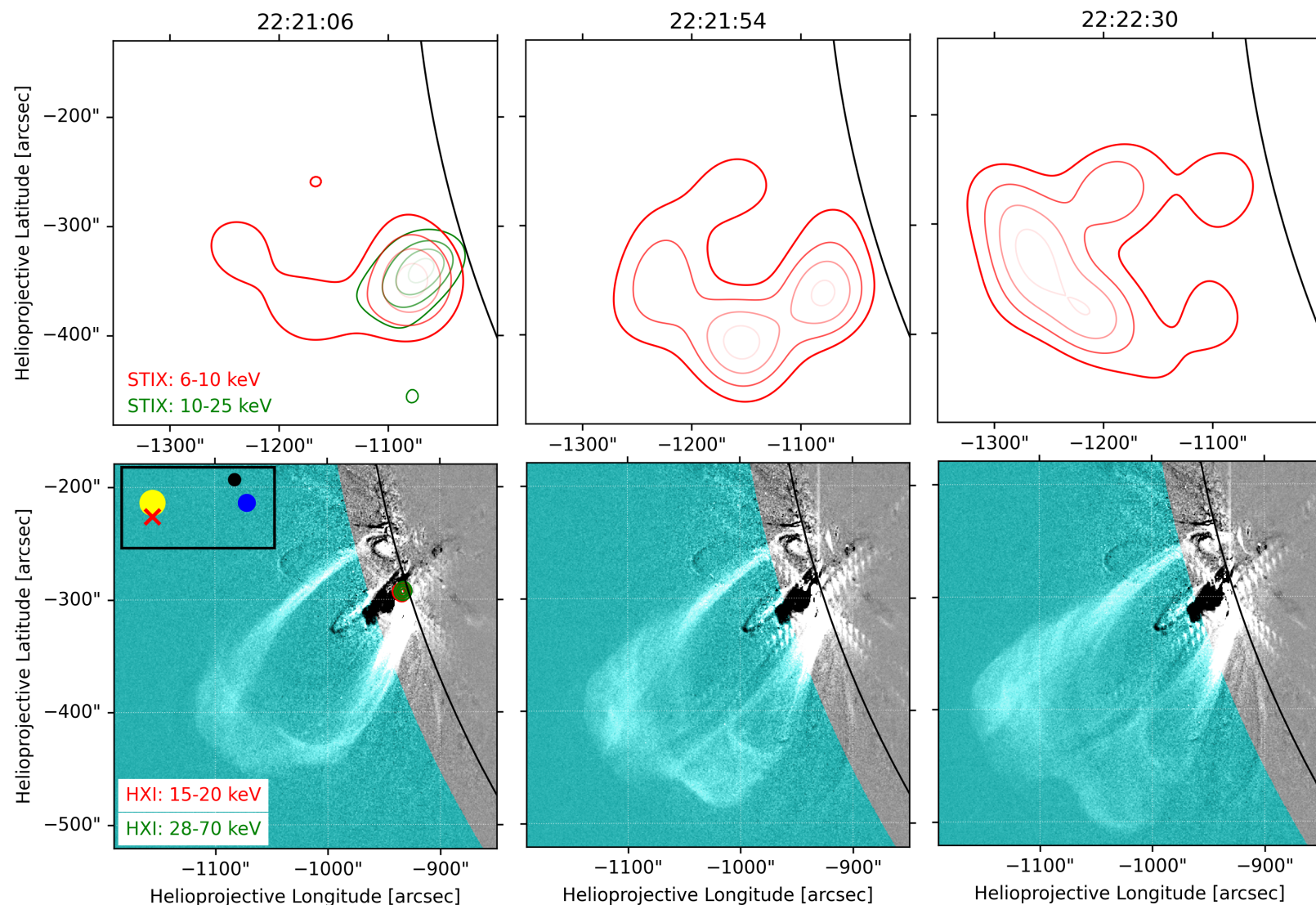
HXR from the high corona: lightcurves



Lightcurves:



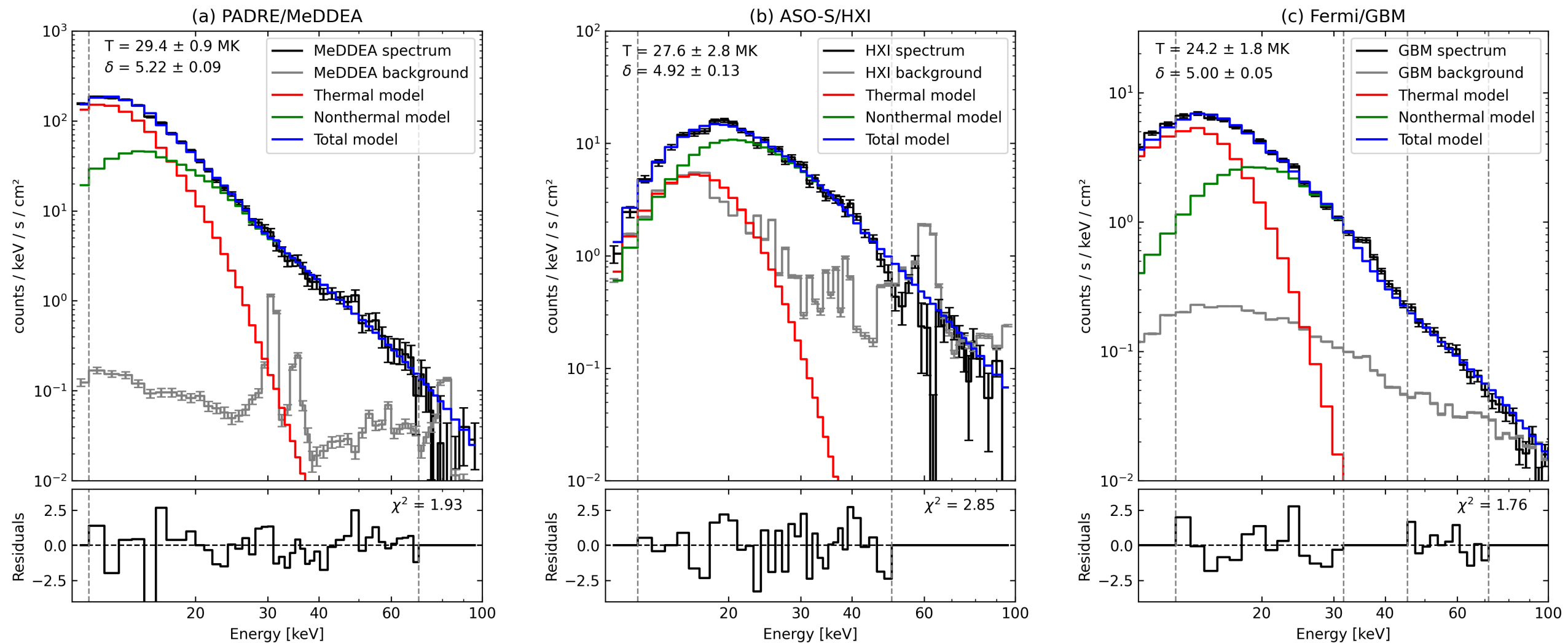
HXR from the high corona: imaging



- Top panel: STIX images (sub-collimators 7-10 used)
- Lower panel: AIA 131 difference images & HXI
- Blue region: what STIX can observe (using degree of occultation)

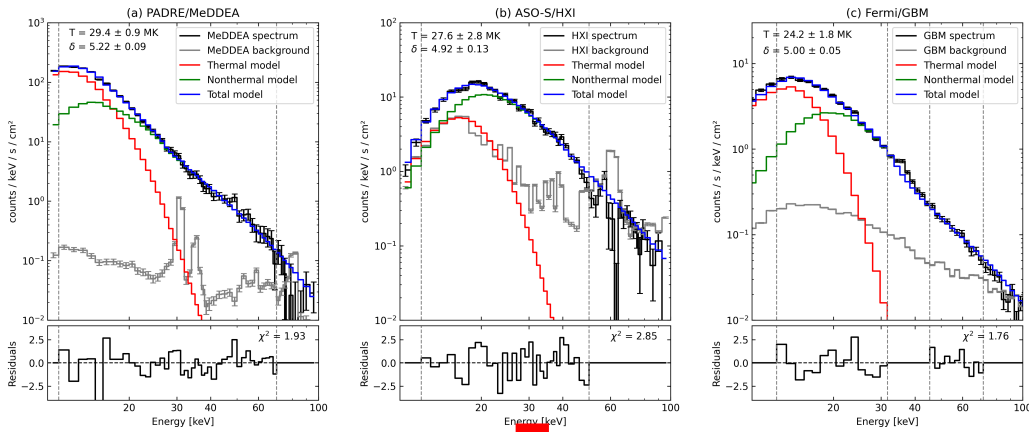
Stiefel et al. (2026), in prep.

HXR spectra from Earth view



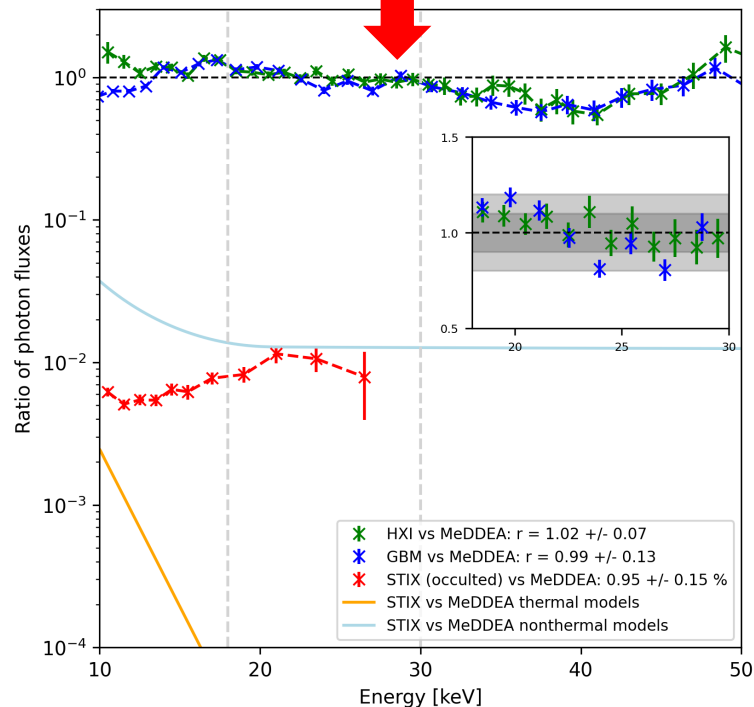
Stiefel et al. (2026), in prep.

HXR from the high corona: comparing photon spectra



- MeDDEA with HXI&GBM: consistent in 18-30 keV
- STIX nonthermal signal: $\sim 1\%$ of MeDDEA
- Thermal energy:

	Flare emission	High corona
$E_{\text{th}} [10^{29} \text{ erg}]$	2.42 ± 0.13	(1) 6.13 ± 1.62 (2) 4.30 ± 1.14
δ	5.22 ± 0.09	5.25 ± 0.17



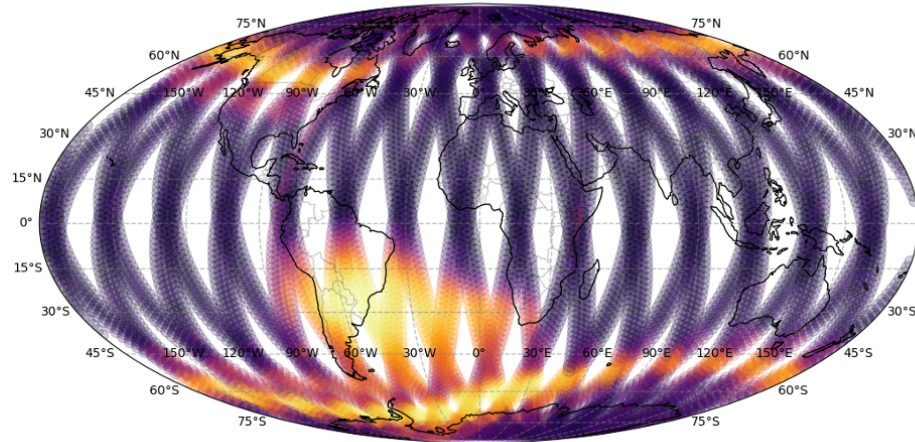
X-ray emission from the high corona is an integral part of the total solar eruption
 -> Krucker & Masuda (2026)

Electron belt spectra measured by MeDDEA

Goal: Measure difference in the electron belt before and after a large flare

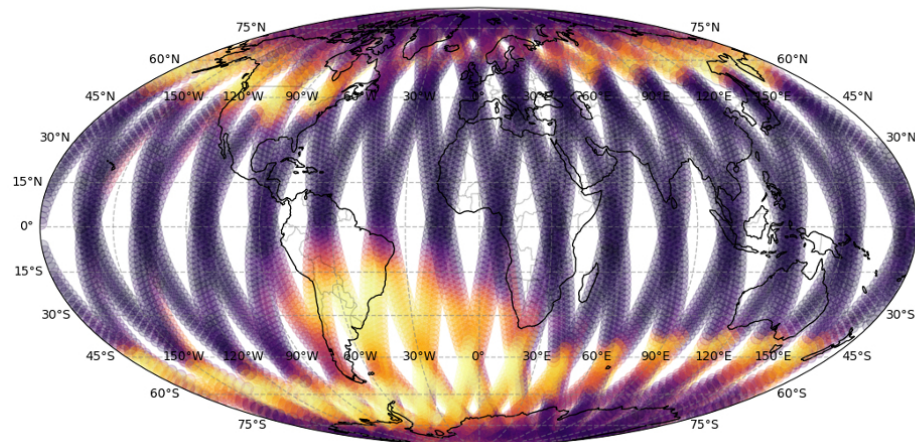
2026-01-15 00:00:00 to 2026-01-18 23:59:00

Before X1.9
Jan 18, 26

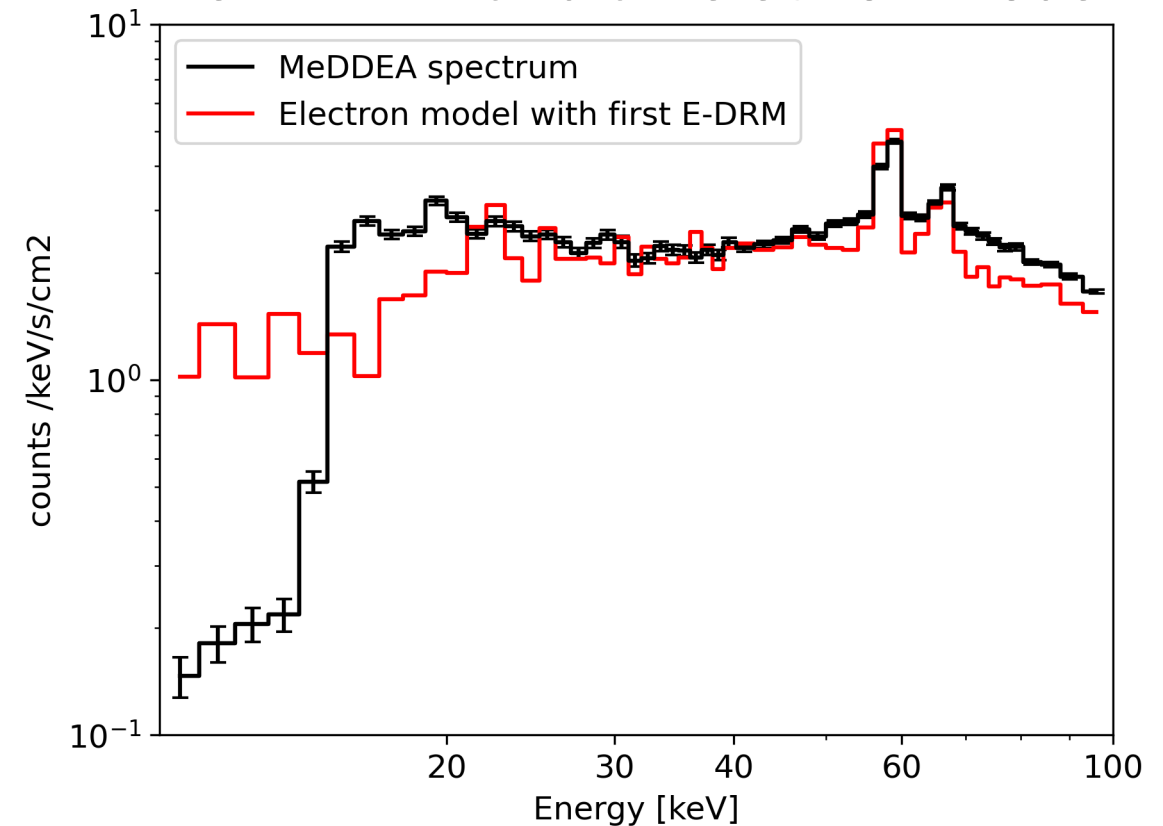


2026-01-19 00:00:00 to 2026-01-22 23:59:00

After X1.9
Jan 18, 26

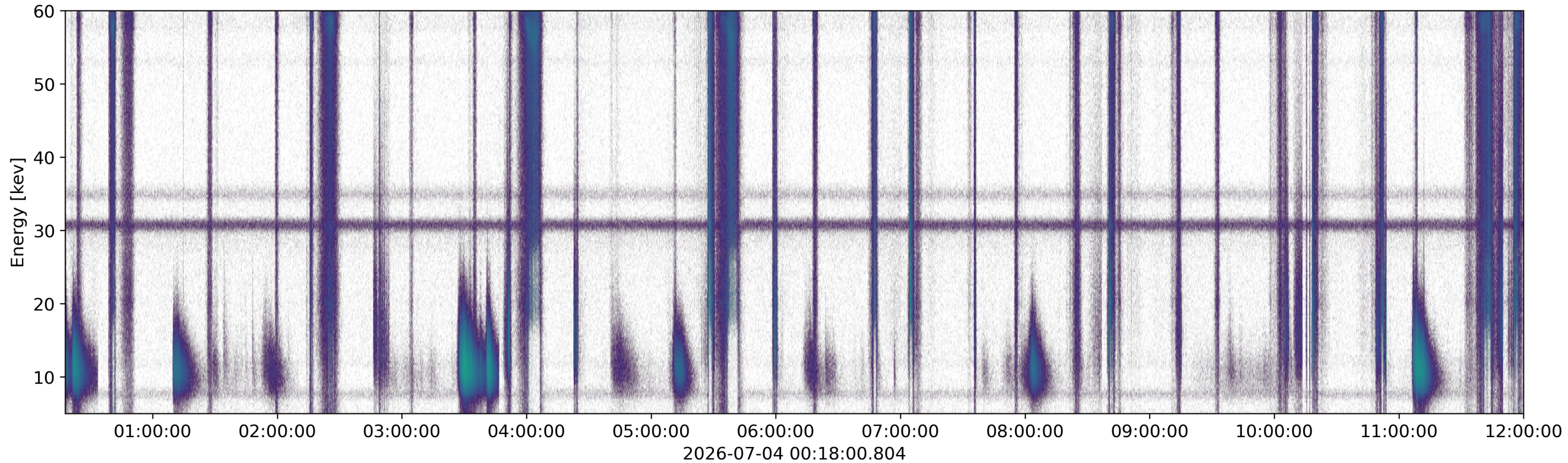


First effort to fit the spectrum using the E-DRM and an electron model



Renaud et al. (2026), ongoing work

Summary



MeDDEA data ready for scientific analysis!

First study: occulted emission using STIX and MeDDEA



Questions?
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Backup