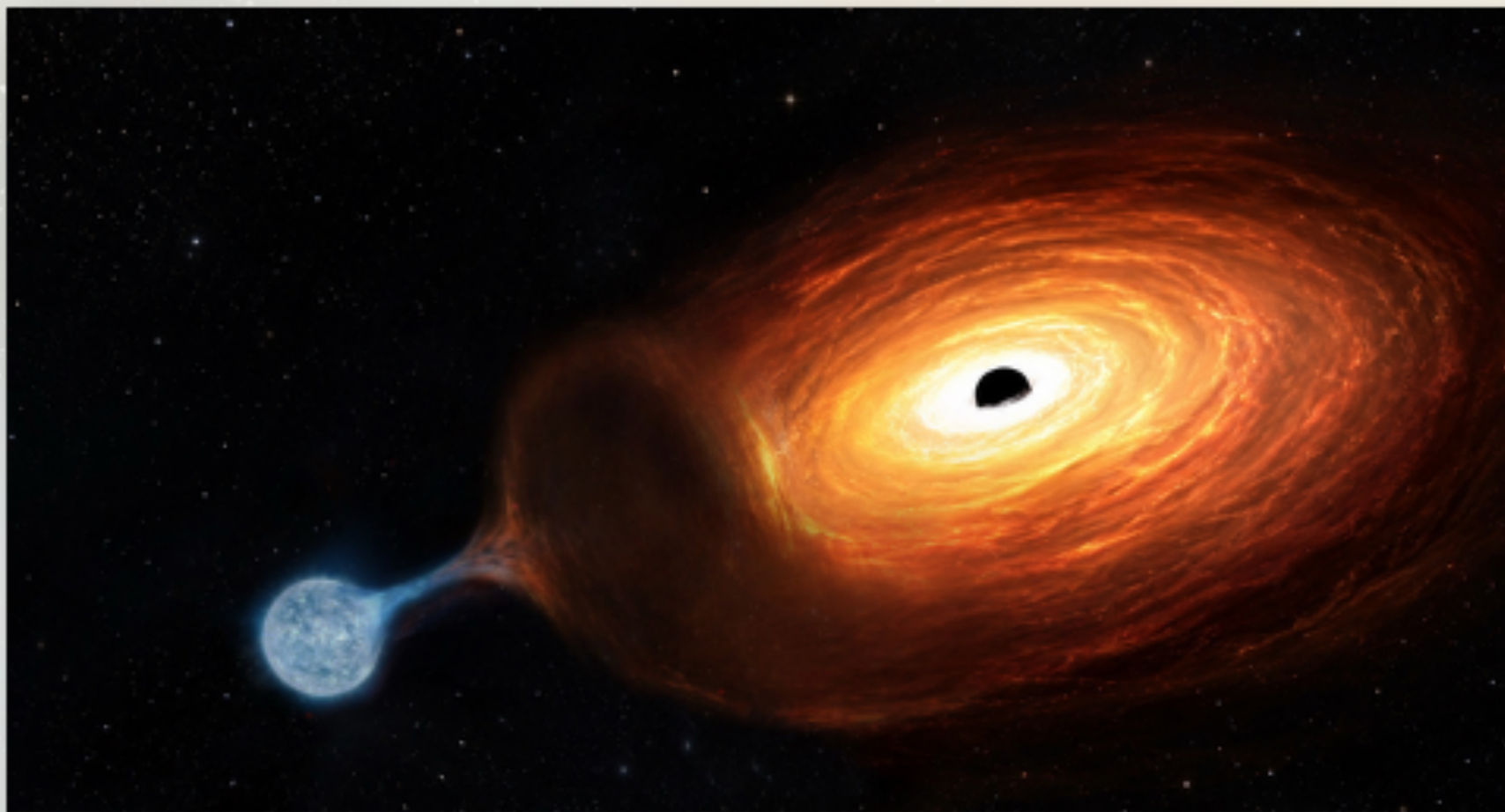


THE DISK ATMOSPHERE PROPERTIES OF 4U1916-05



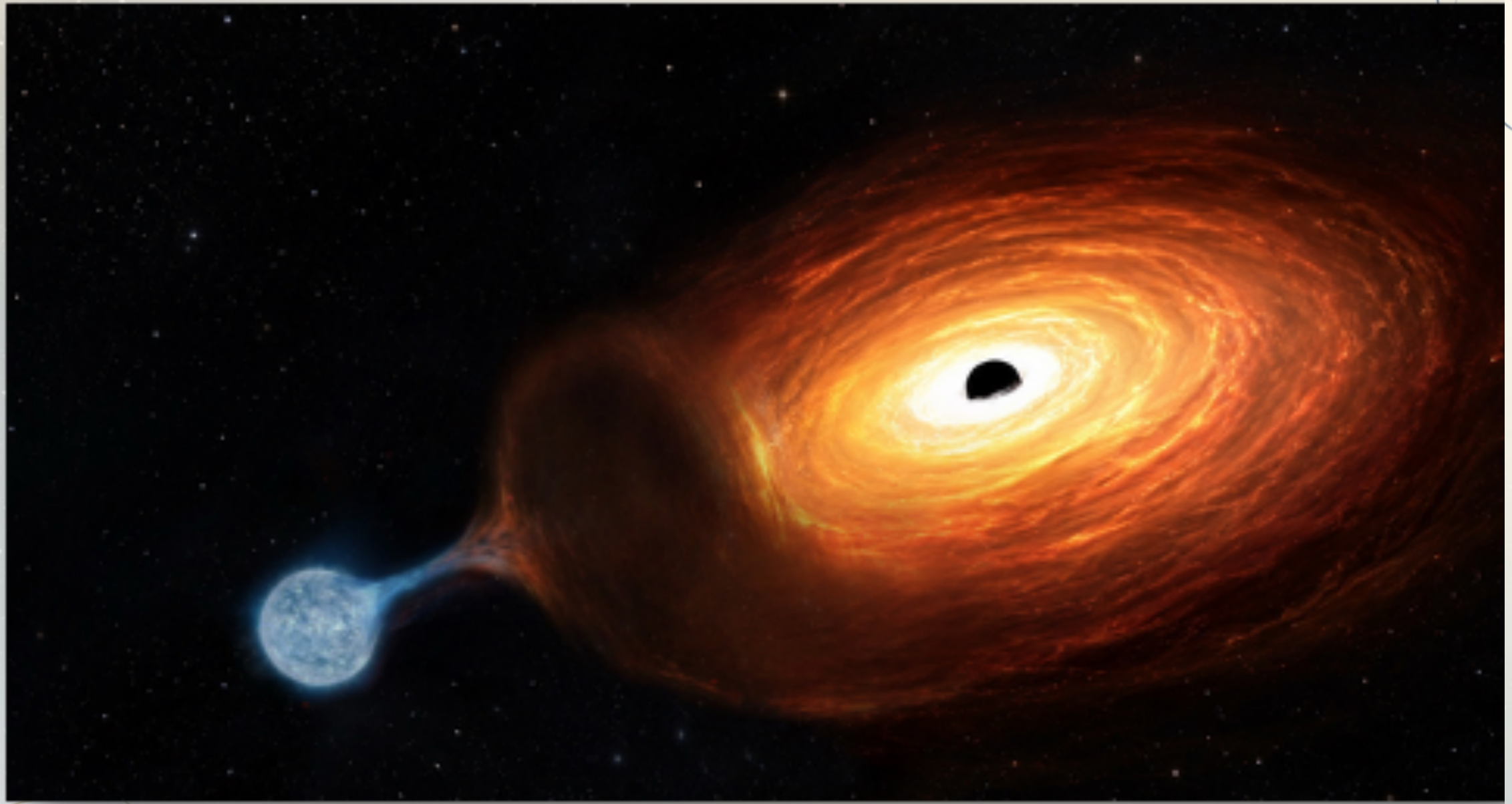
Credit: G. Peluso

Speaker: Sara Peluso (PhD student)

Supervisors and Co-supervisors: M. Díaz Trigo, V. Mainieri, E. Costantini, N. Degenaar, J. Corral Santana

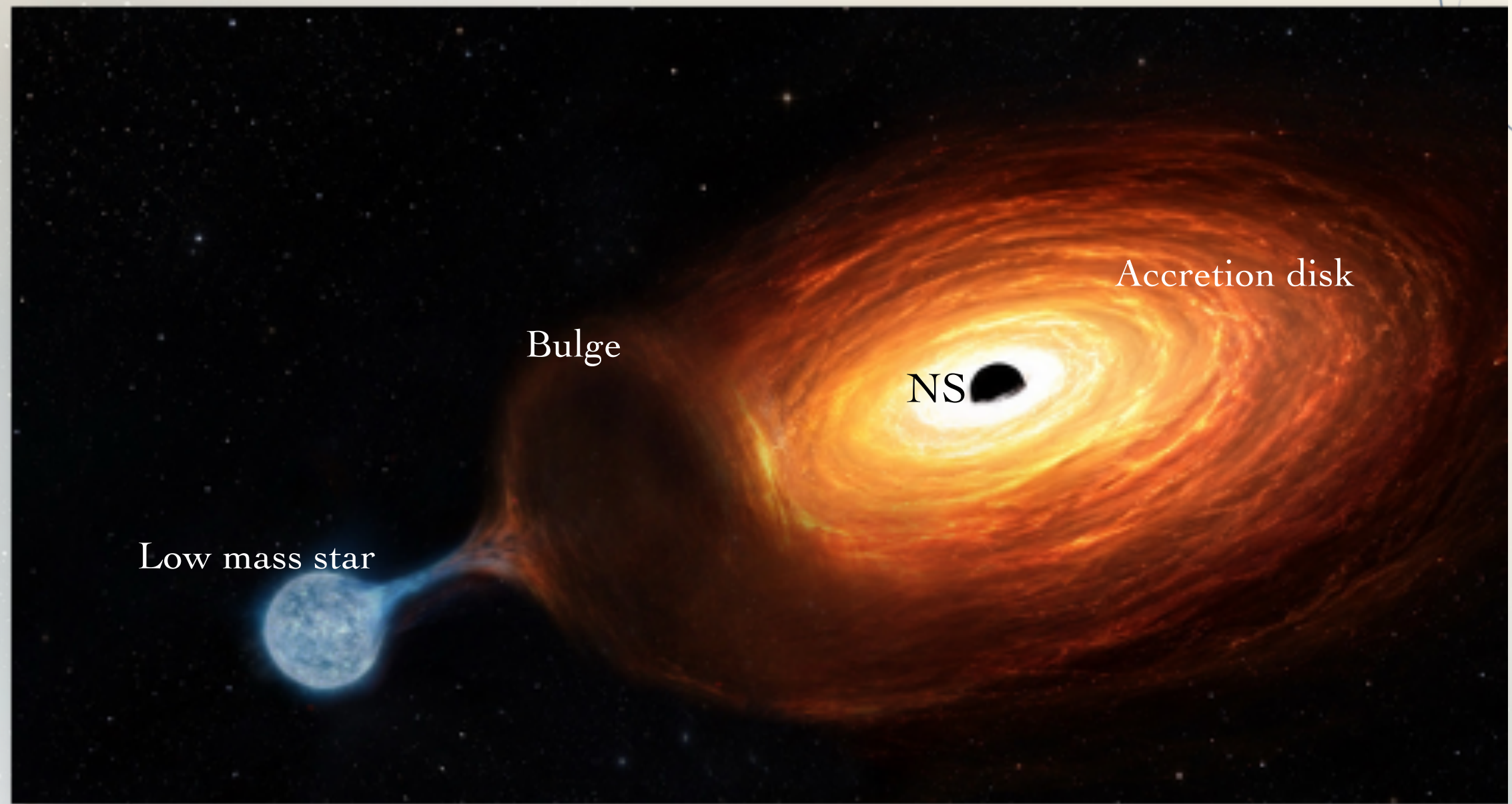


4U1916-05



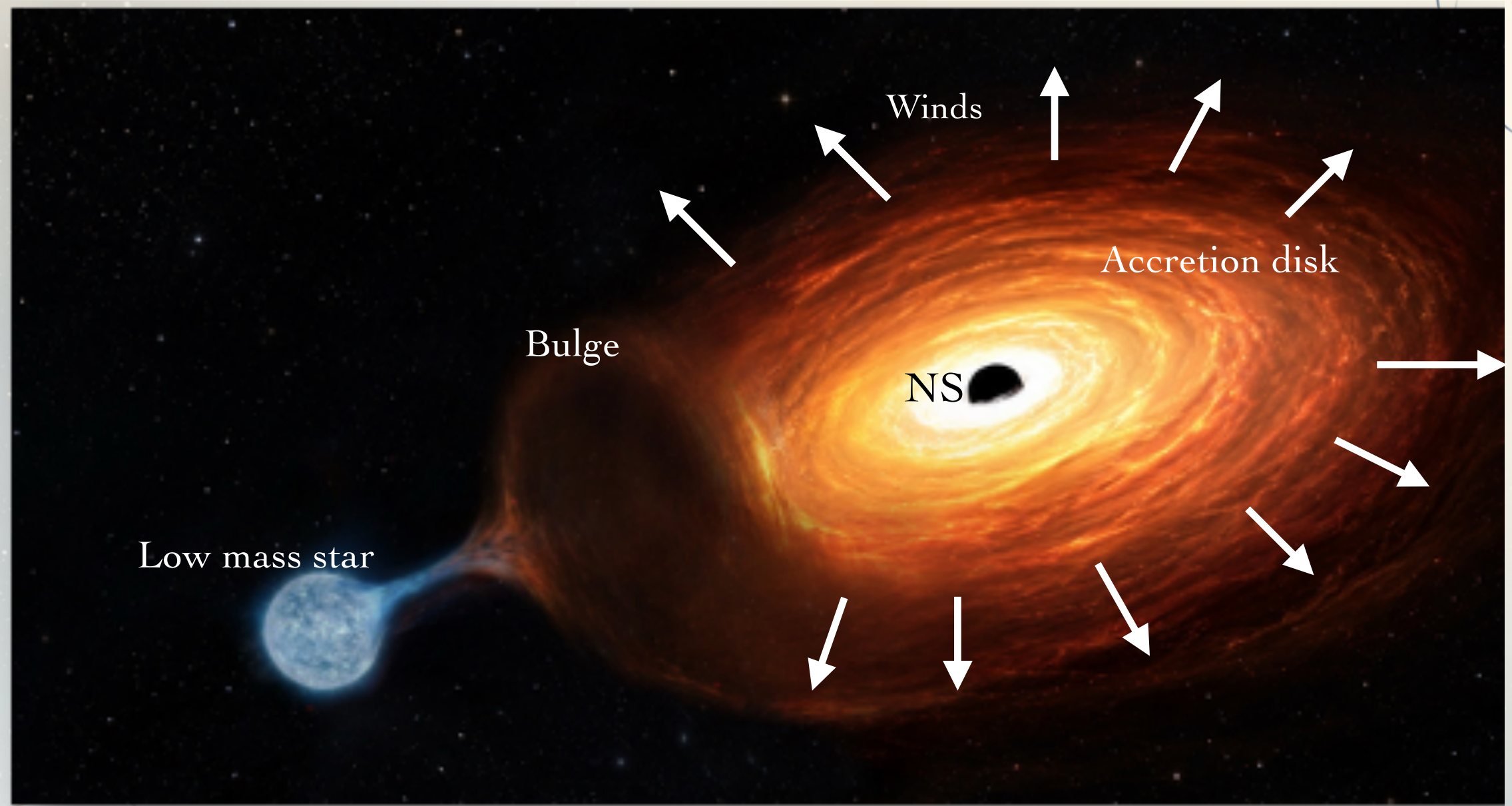
Credit: G. Peluso

4U1916-05



Credit: G. Peluso

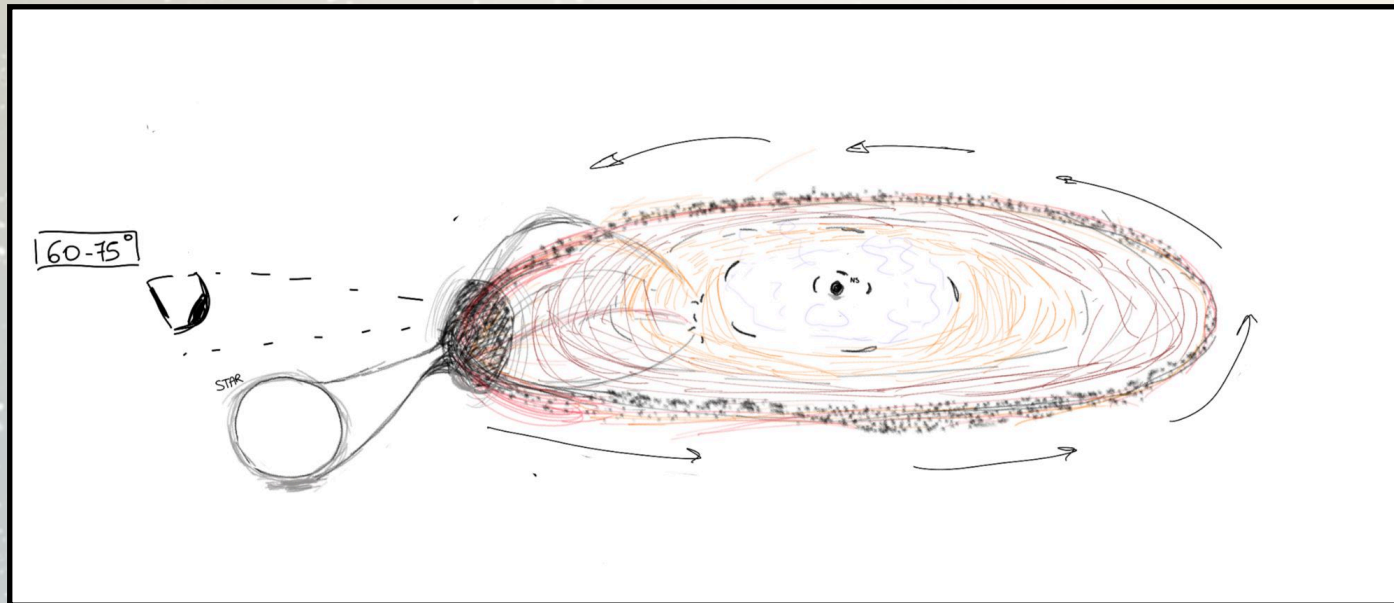
4U1916-05



Credit: G. Peluso

THE DIPPERS

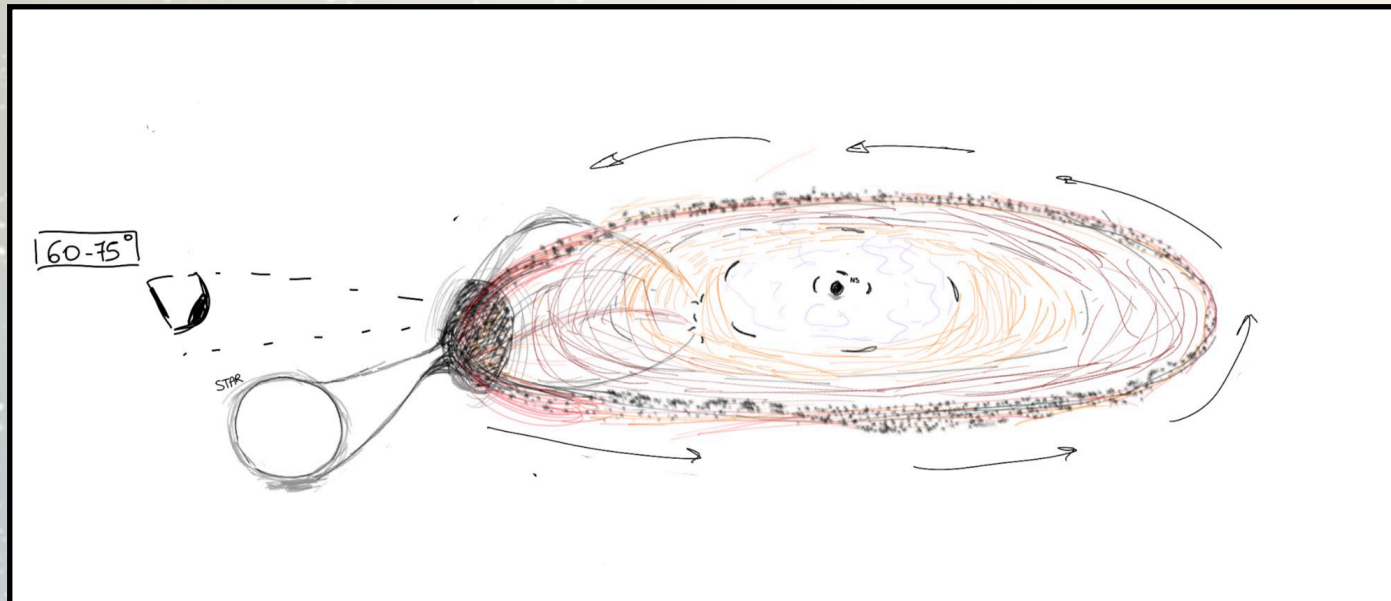
Sketch



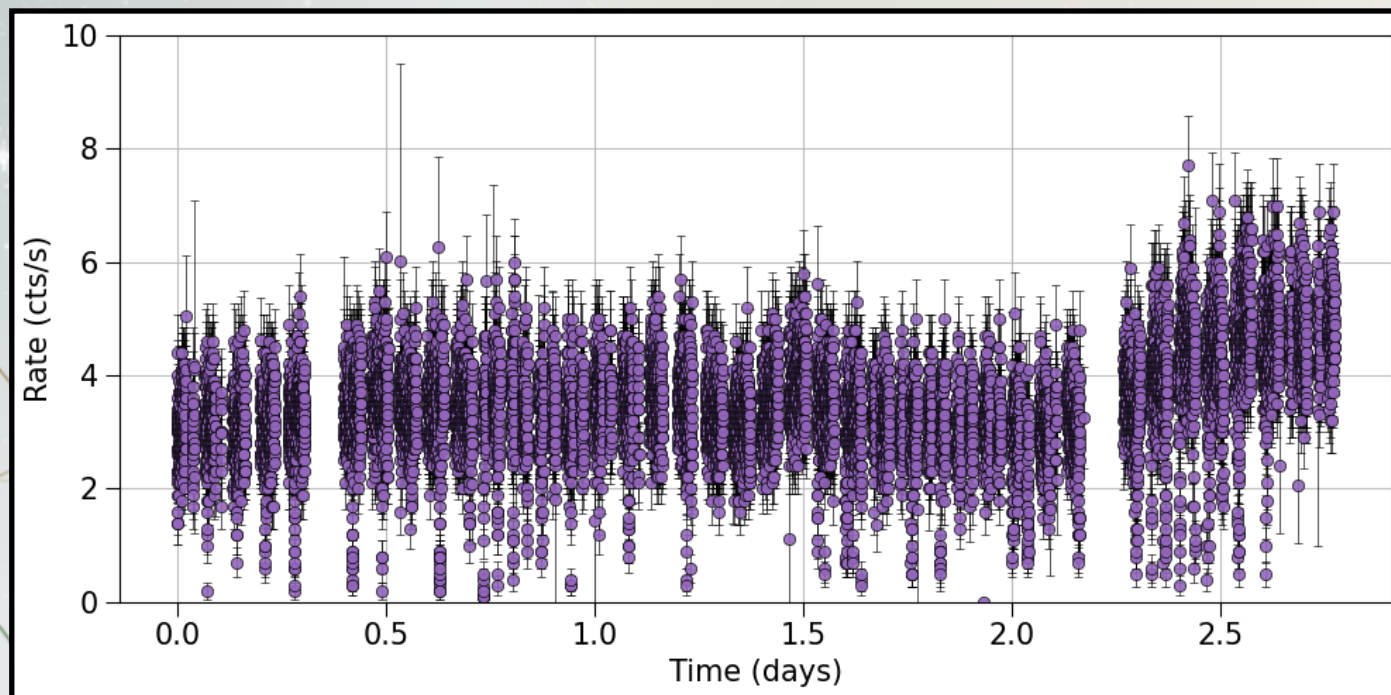
THE DIPPERS



Sketch



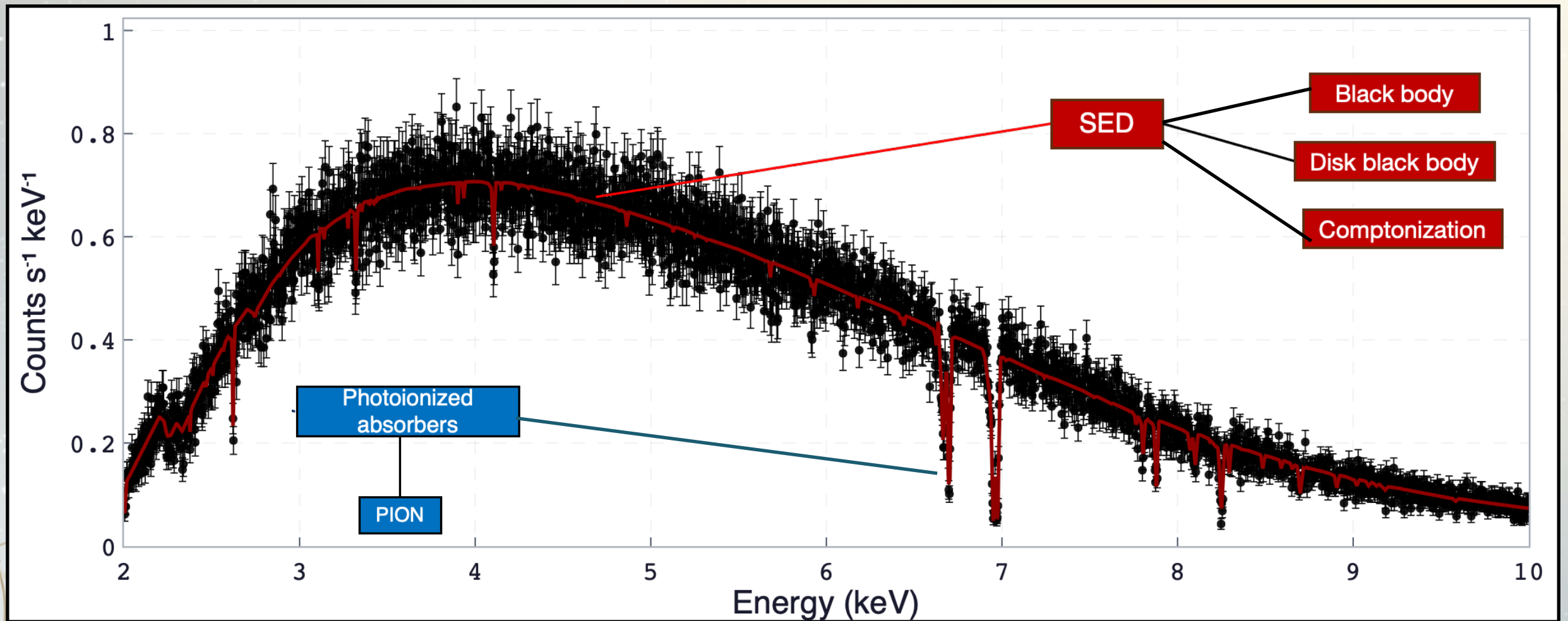
Light curve



4U1916-05

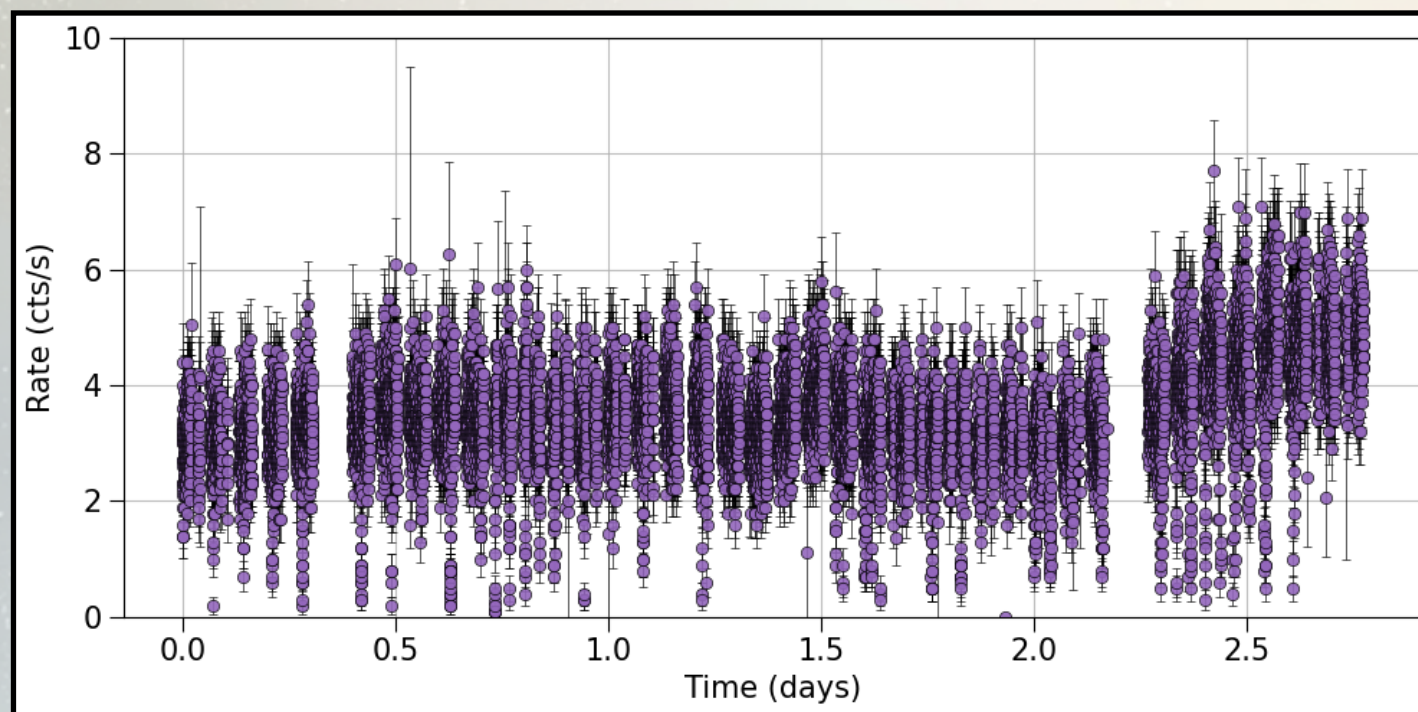
Period	50 min
Inclination angle	60-75 degree
Accretion	Persistent
Luminosity	$\sim 4 \cdot 10^{36}$ erg/s

XRISM DATA



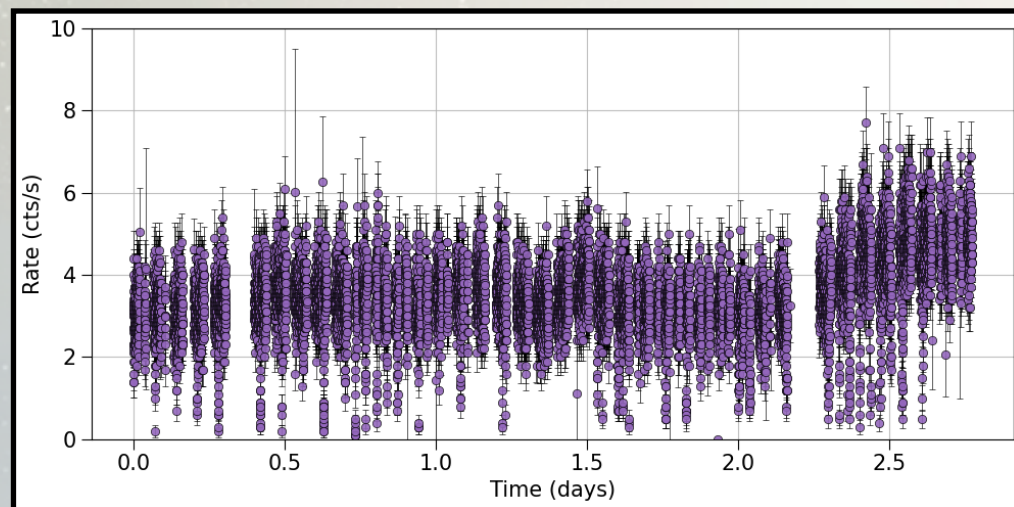
SPECTRAL ANALYSIS

Full light curve

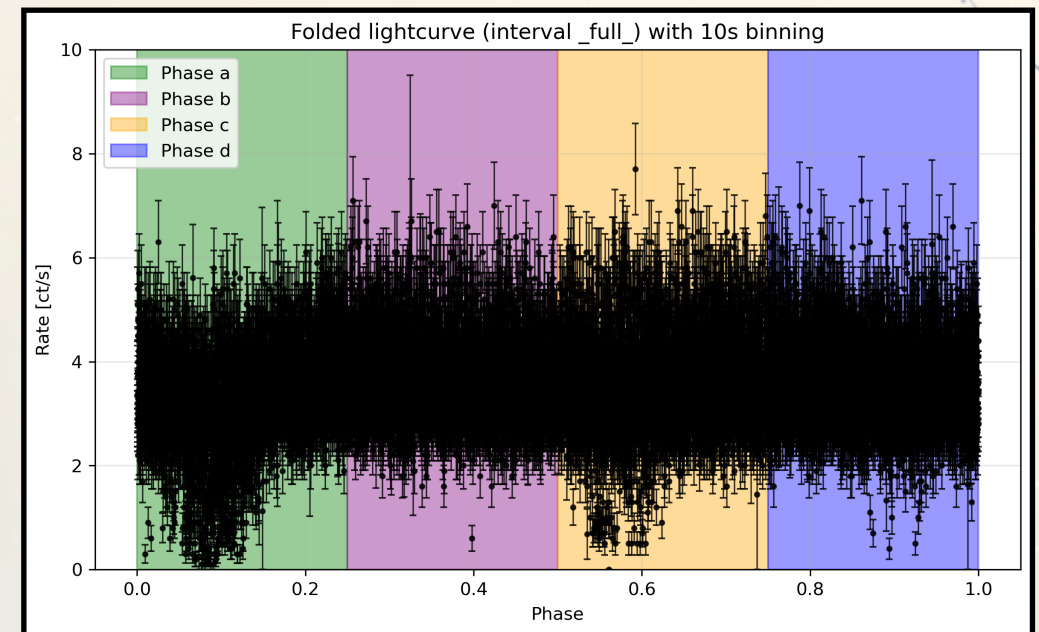


SPECTRAL ANALYSIS

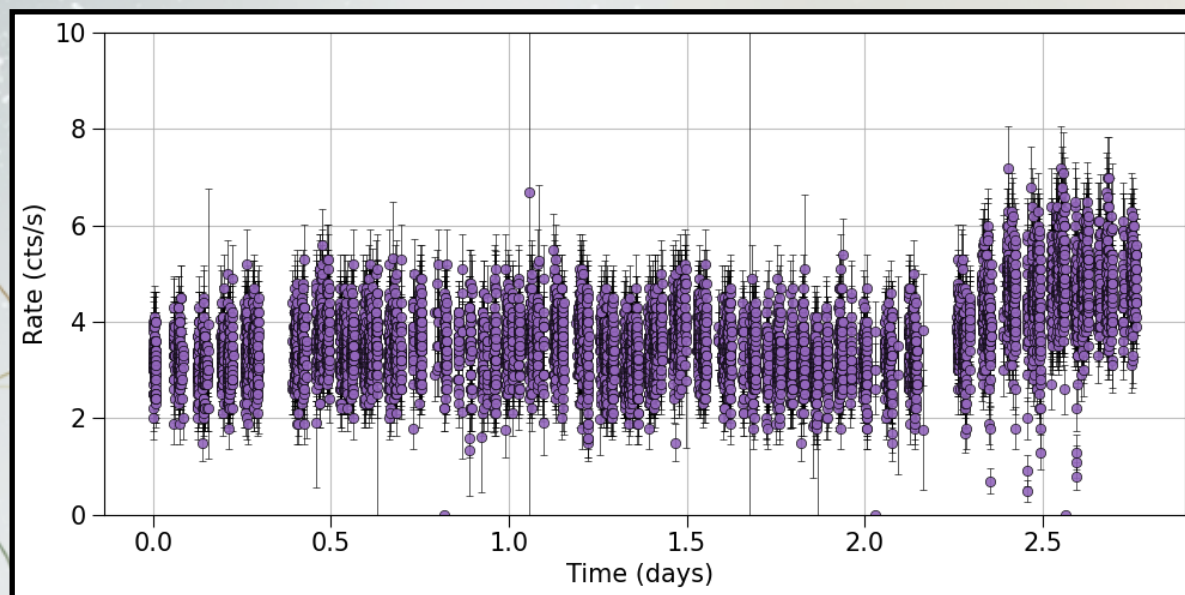
Full light curve



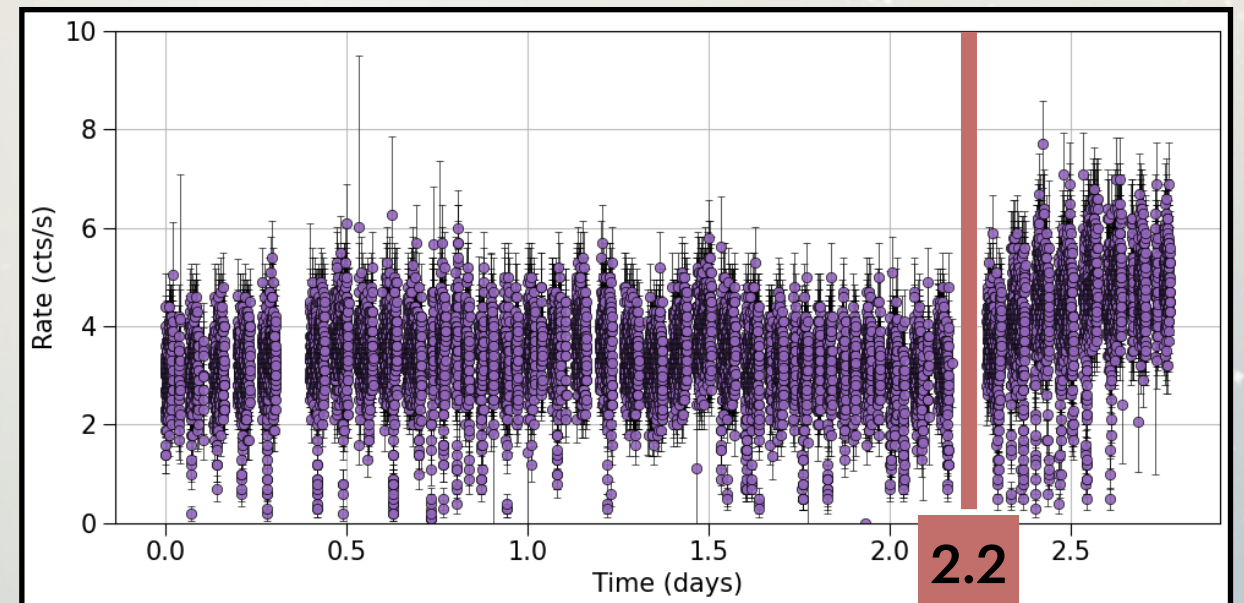
Phase resolved



Persistent

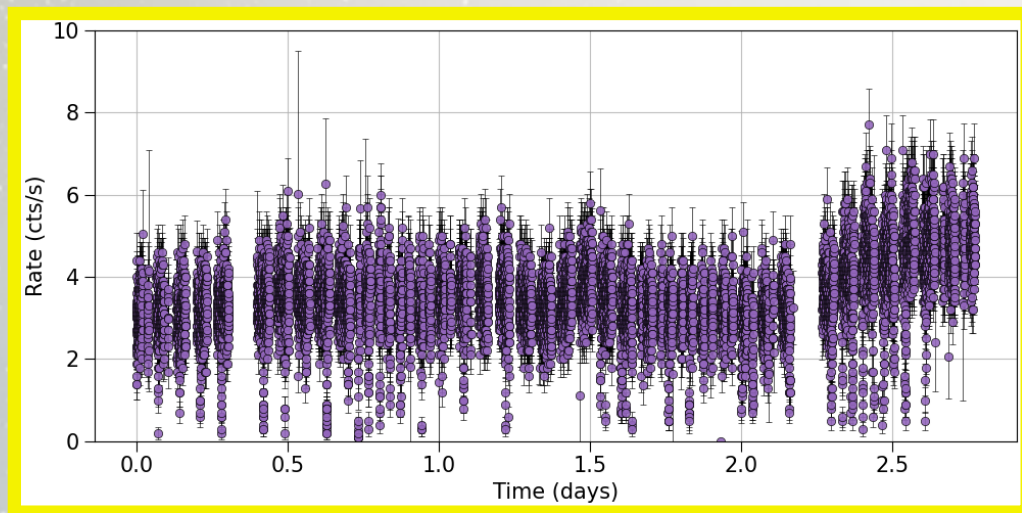


Time resolved

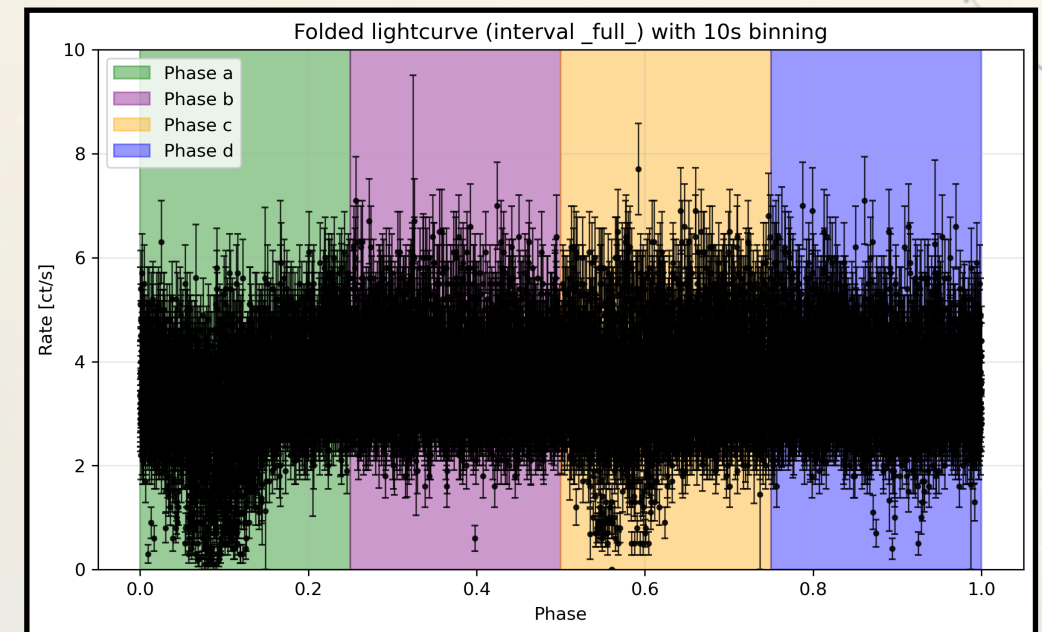


SPECTRAL ANALYSIS

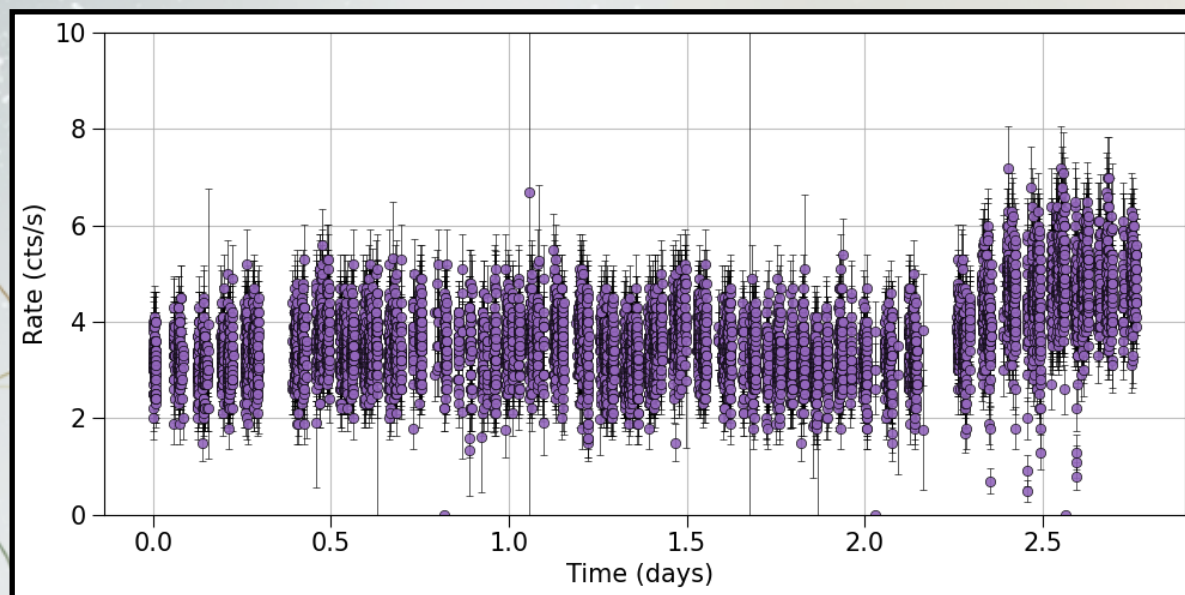
Full light curve



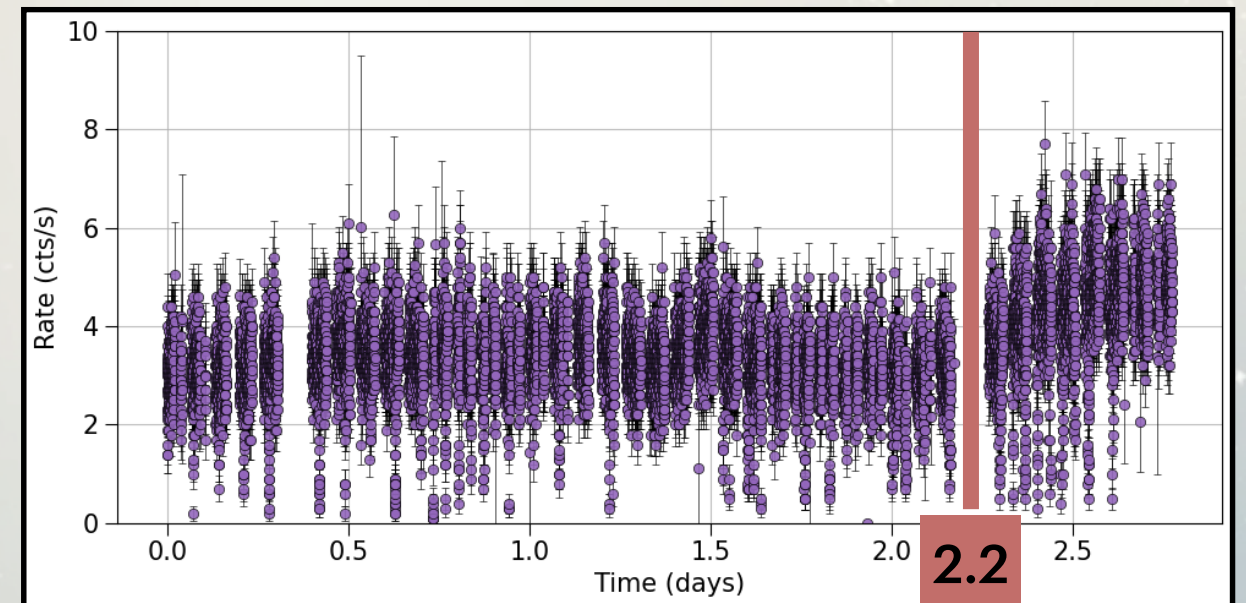
Phase resolved



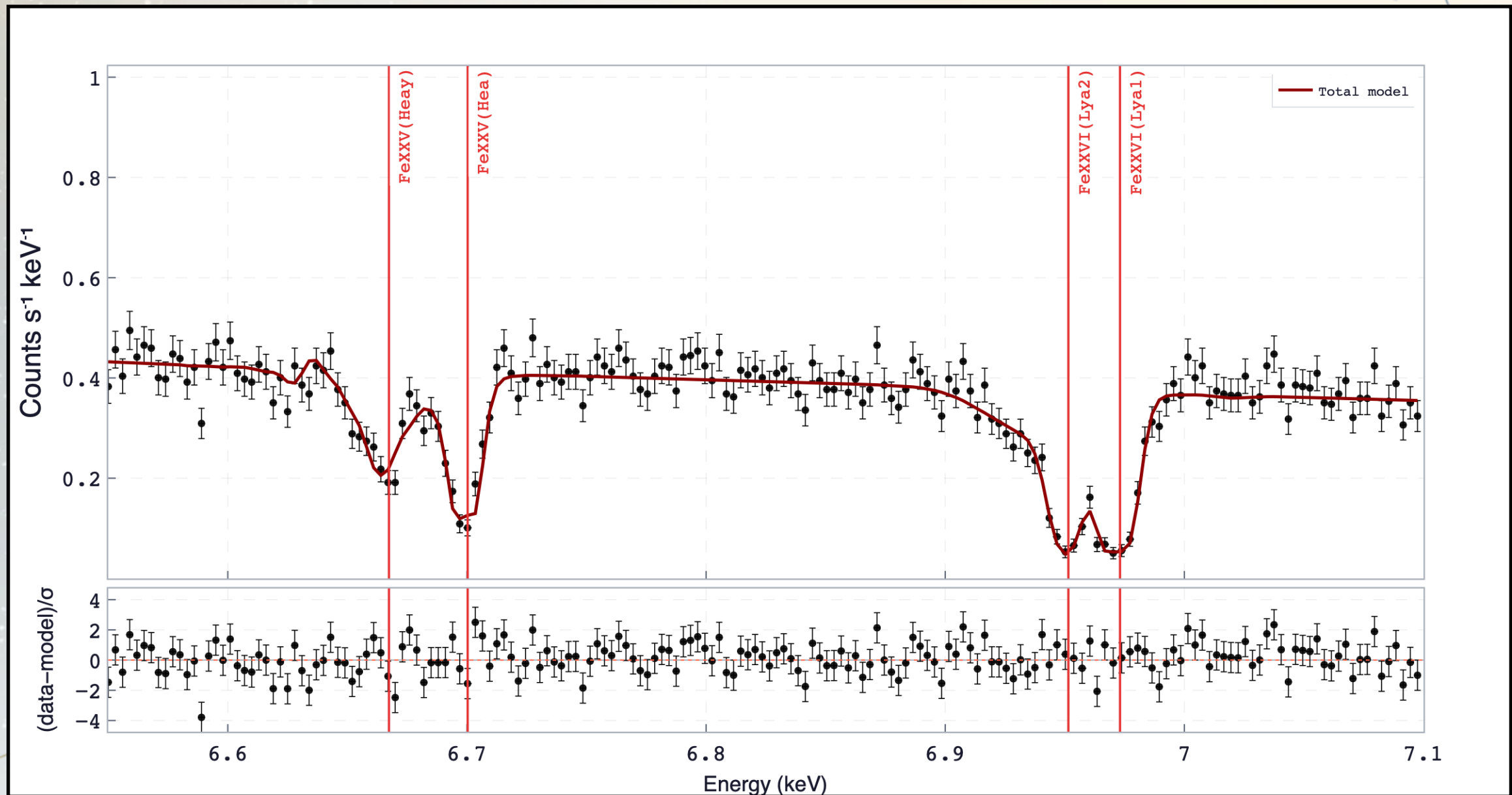
Persistent



Time resolved

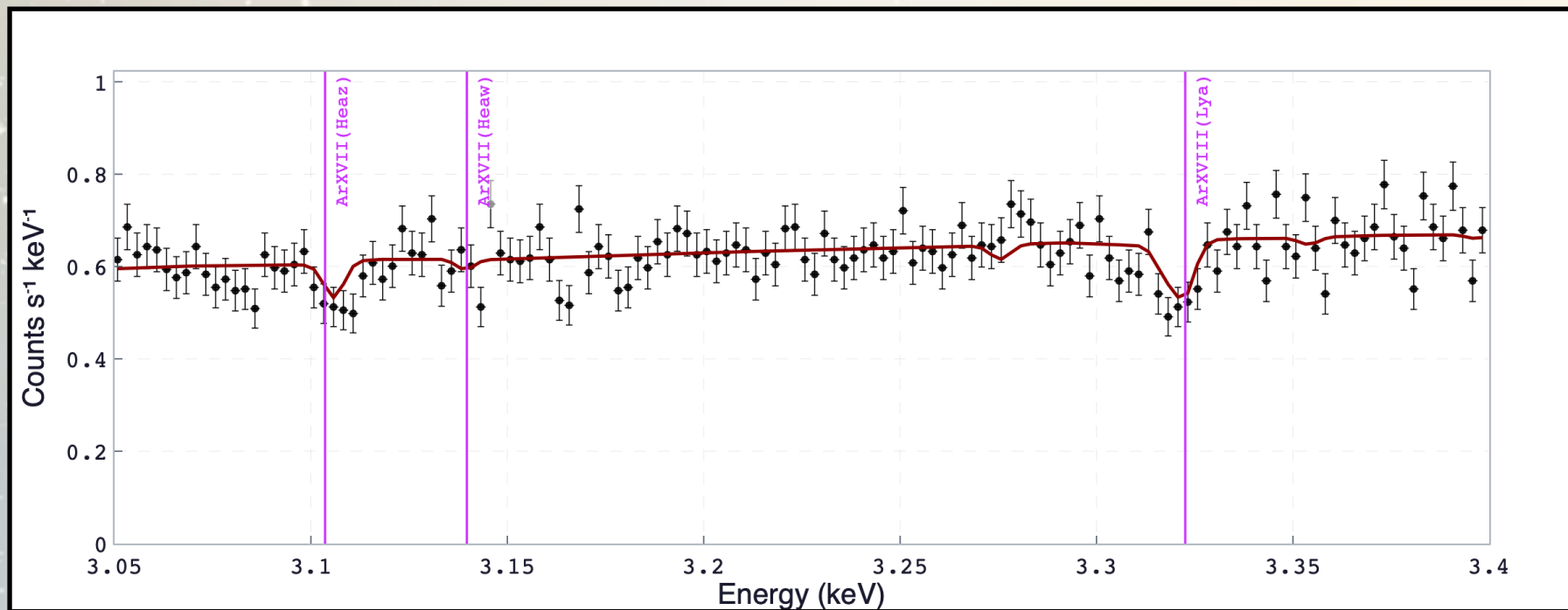


FULL SPECTRUM: QUALITATIVELY INSPECTION



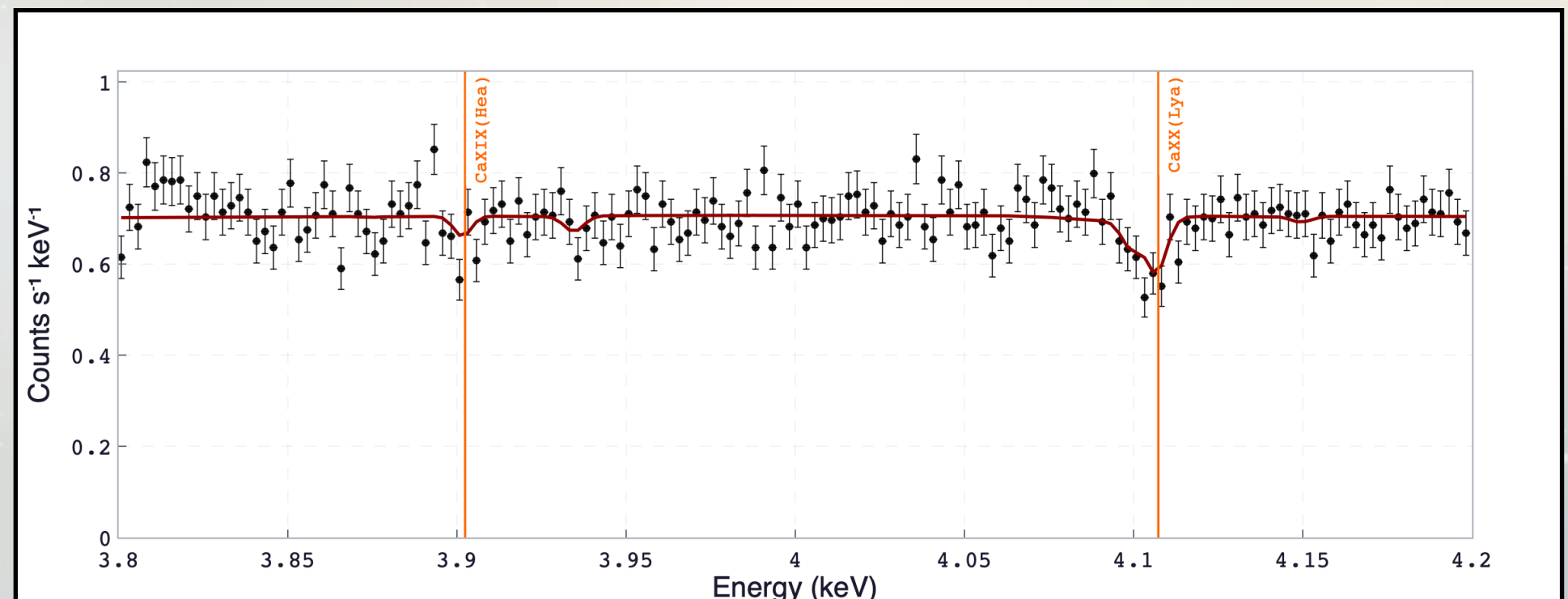
Redshifted wing

FULL SPECTRUM: QUALITATIVELY INSPECTION

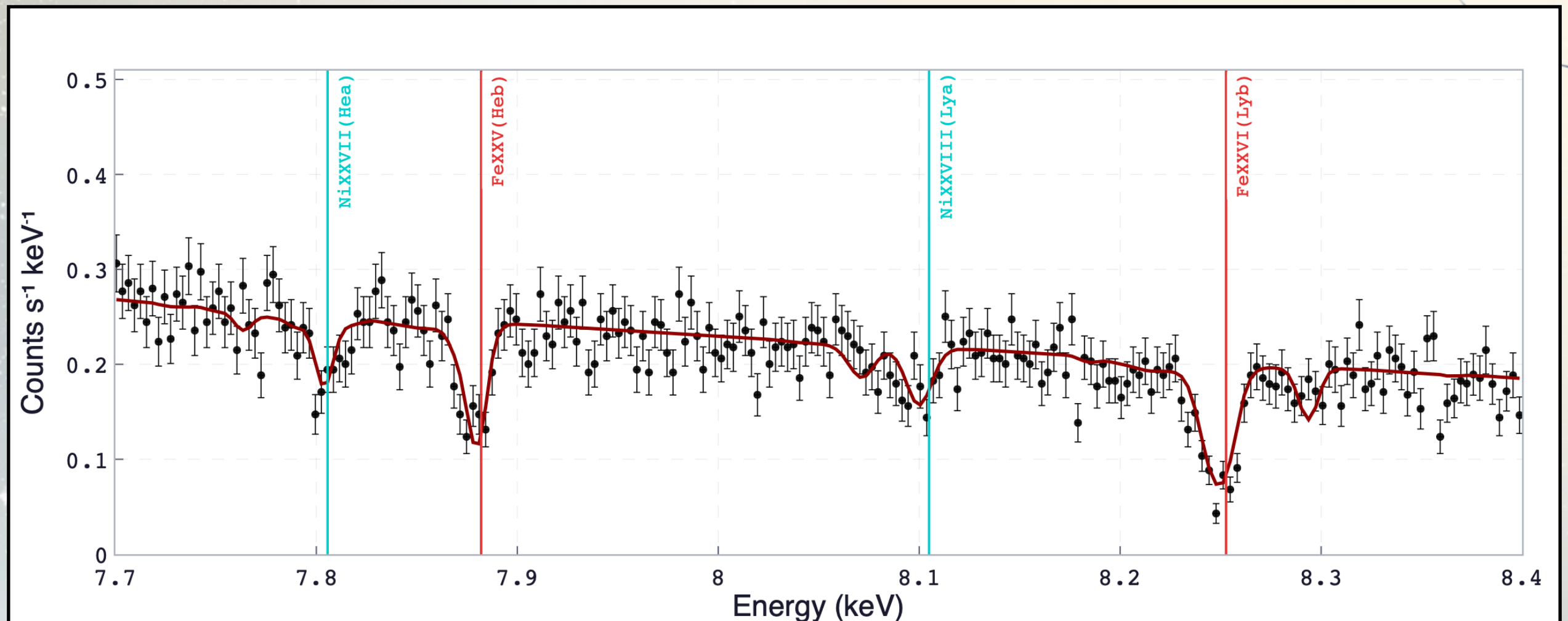


ArXVII Hea α blueshifted

Redshifted lines

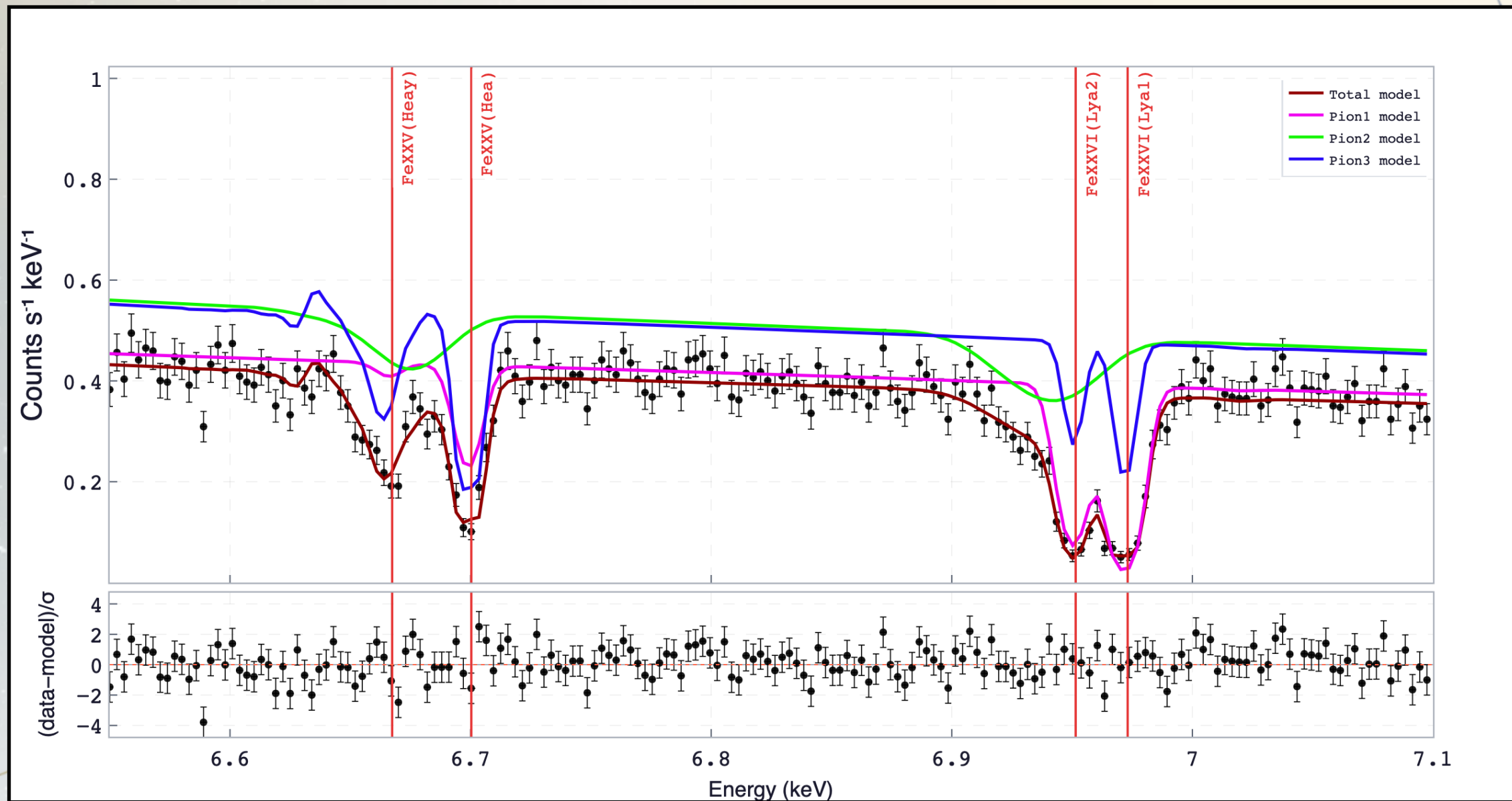


FULL SPECTRUM: QUALITATIVELY INSPECTION

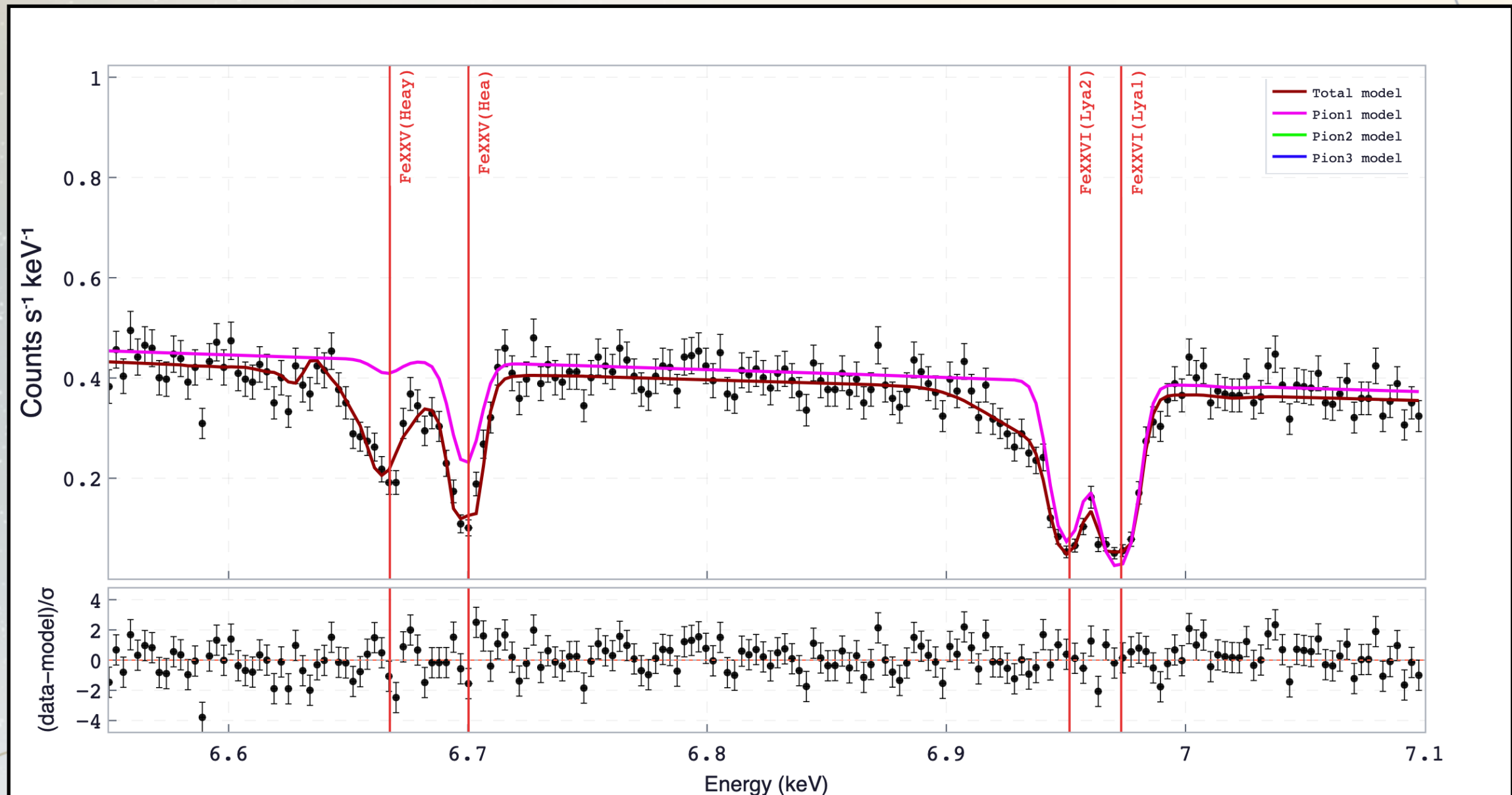


Redshifted lines

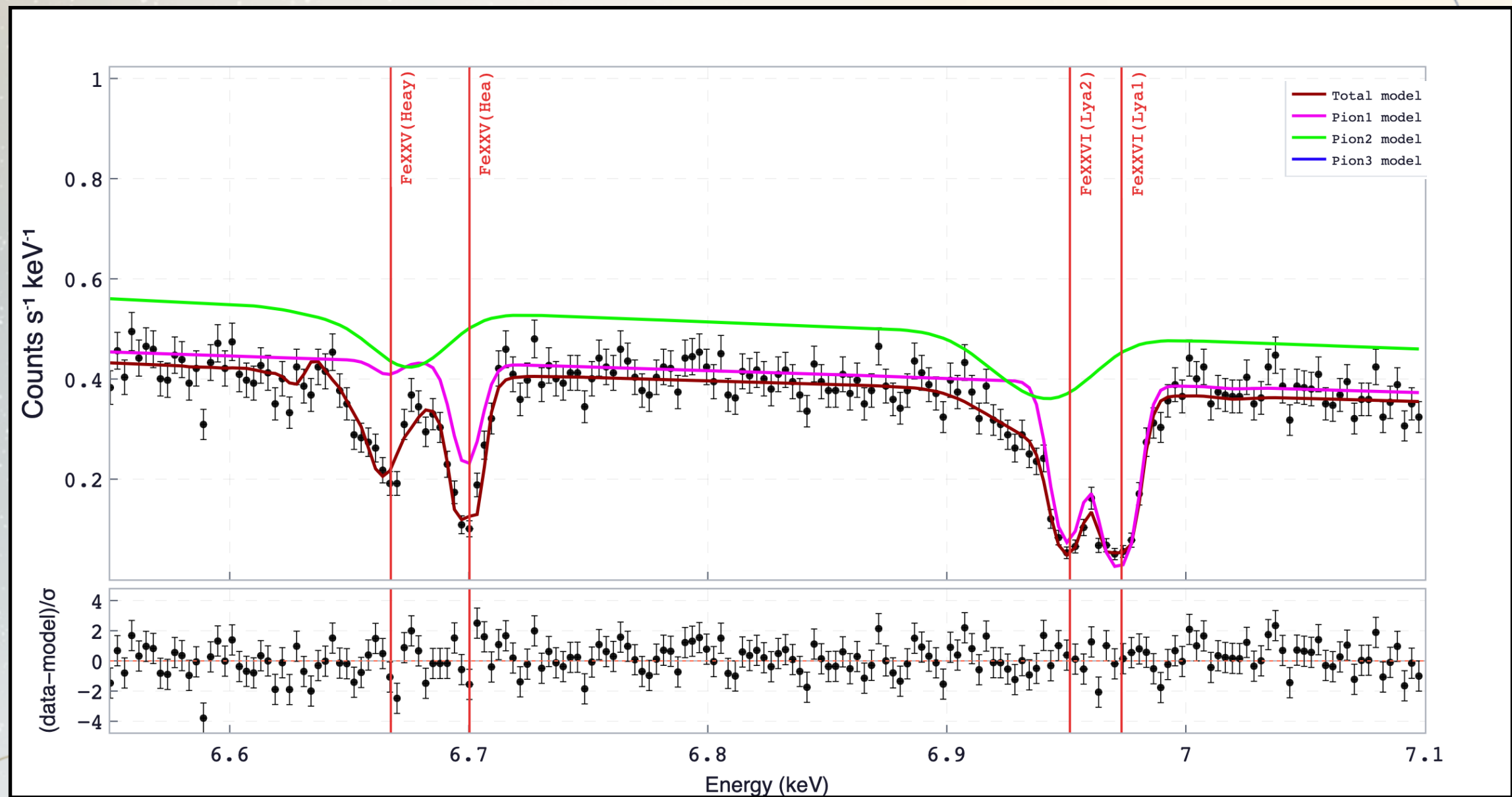
FULL SPECTRUM : MODEL COMPONENTS



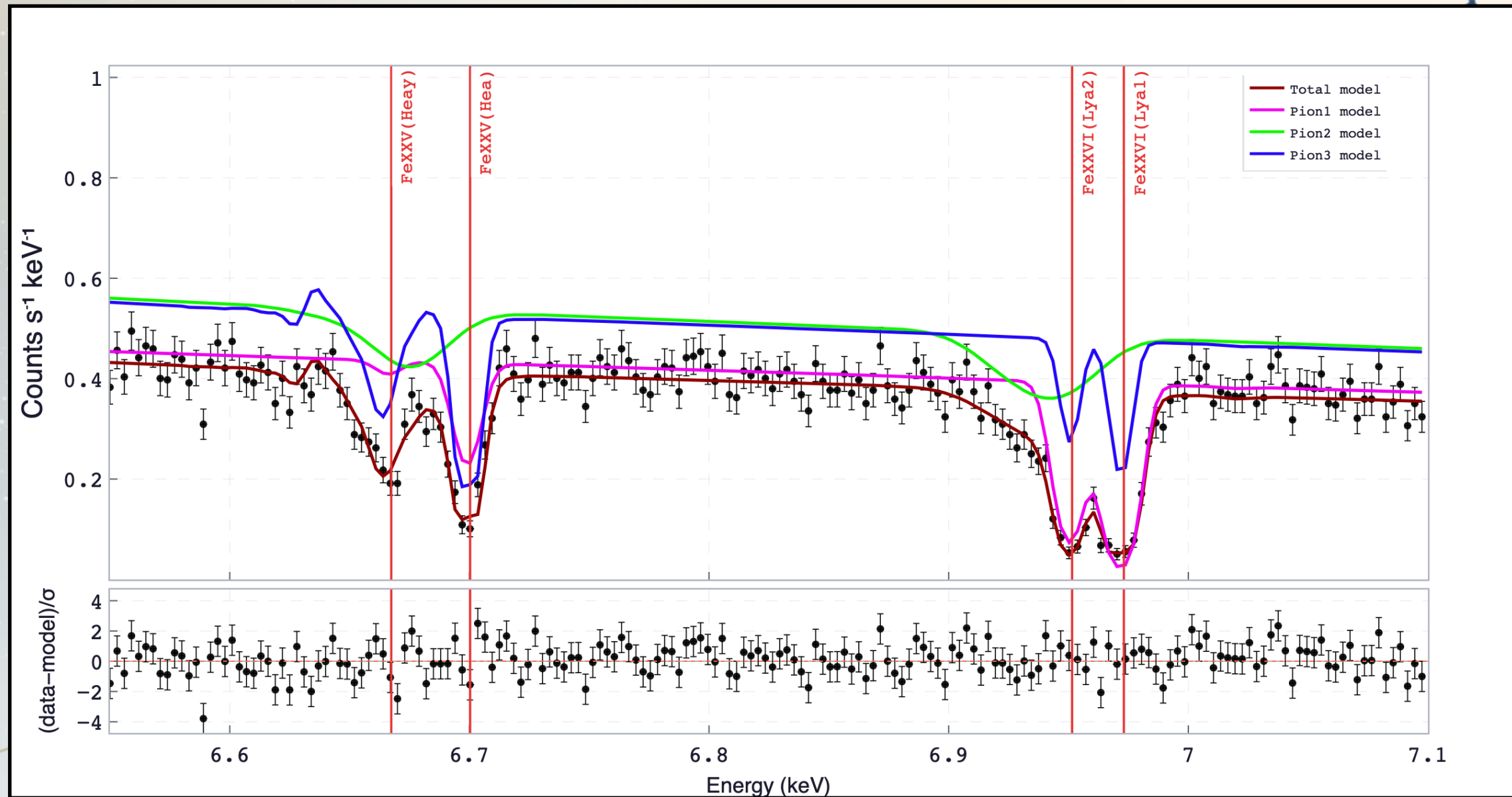
FULL SPECTRUM : MODEL COMPONENTS



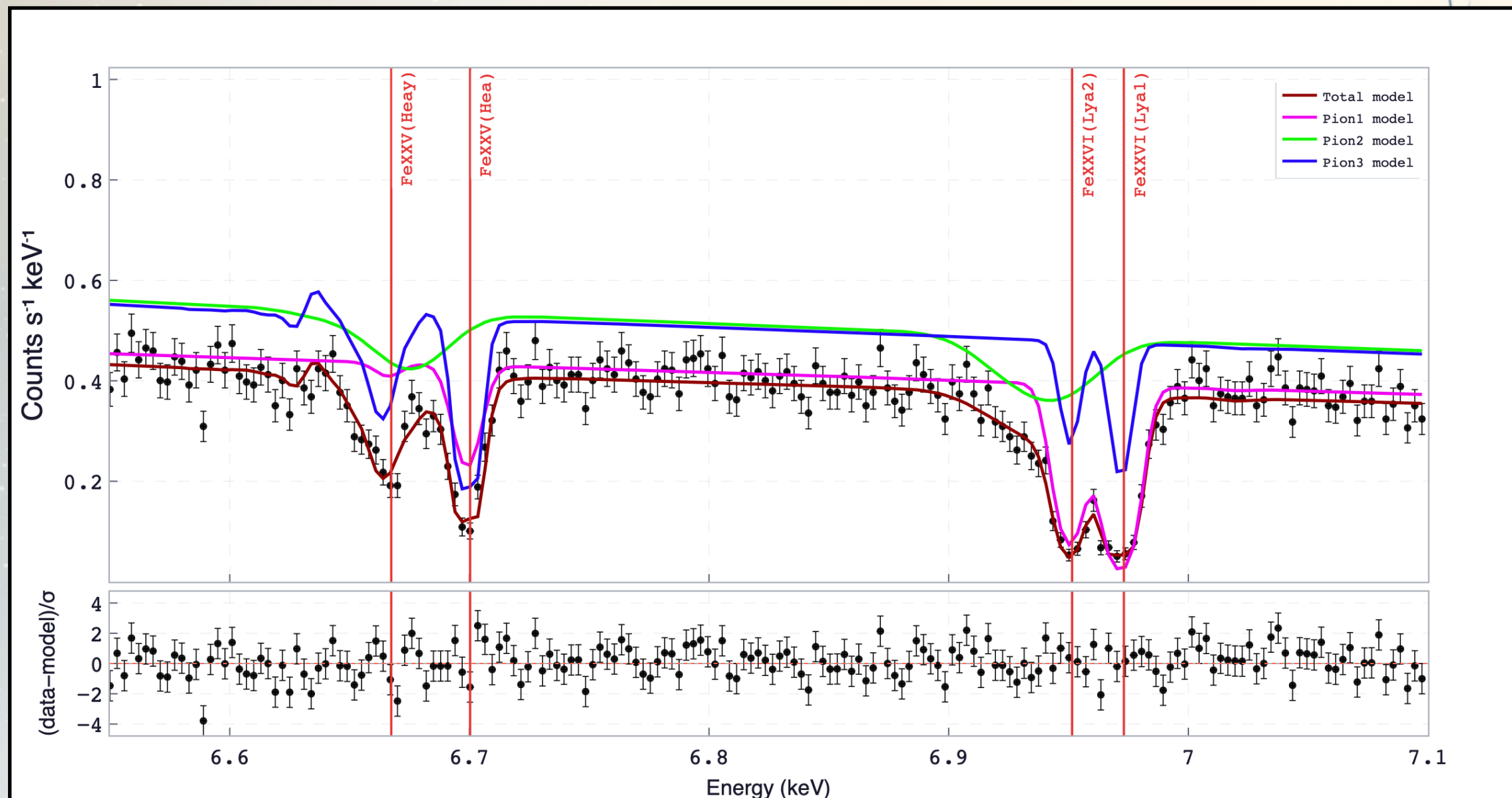
FULL SPECTRUM : MODEL COMPONENTS



FULL SPECTRUM : MODEL COMPONENTS



FULL SPECTRUM : MODEL COMPONENTS



$$\nu_{RMS} = 218^{+14}_{-14}$$

$$\nu_{BULK} = 63^{+15}_{-15}$$

$$\nu_{RMS} = 671^{+119}_{-116}$$

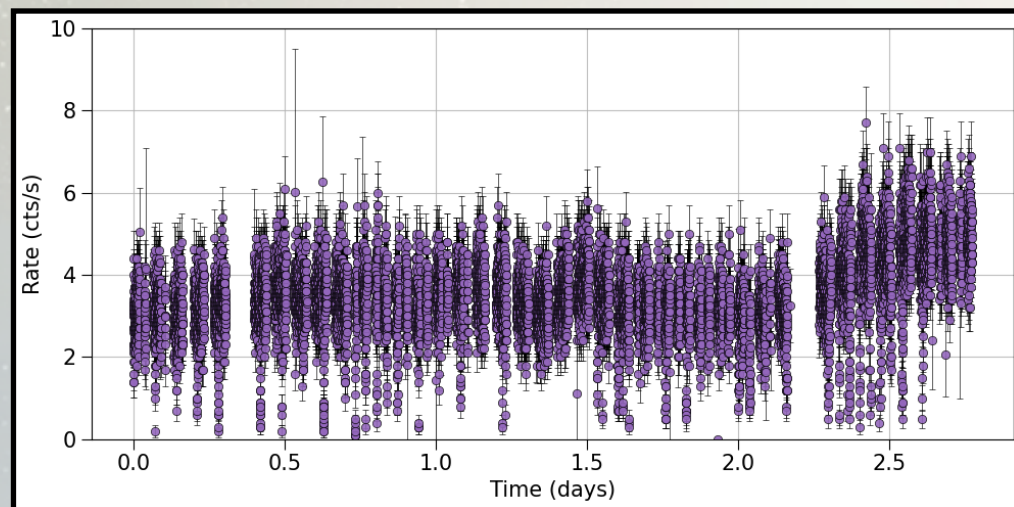
$$\nu_{BULK} = 1129^{+194}_{-249}$$

$$\nu_{RMS} = 129^{+13}_{-14}$$

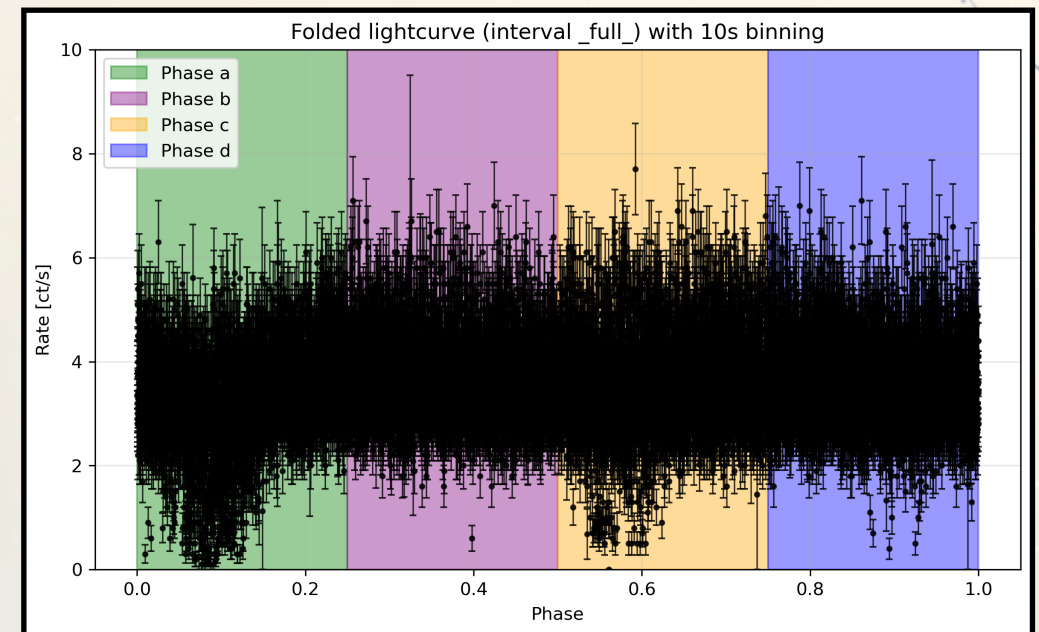
$$\nu_{BULK} = 51^{+22}_{-25}$$

SPECTRAL ANALYSIS

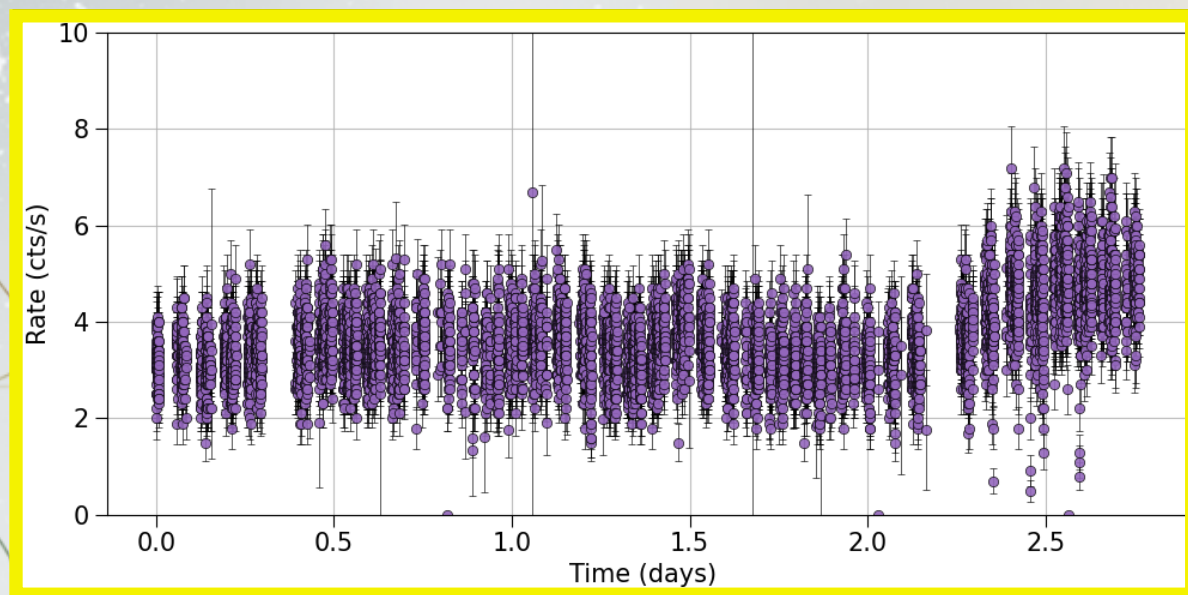
Full light curve



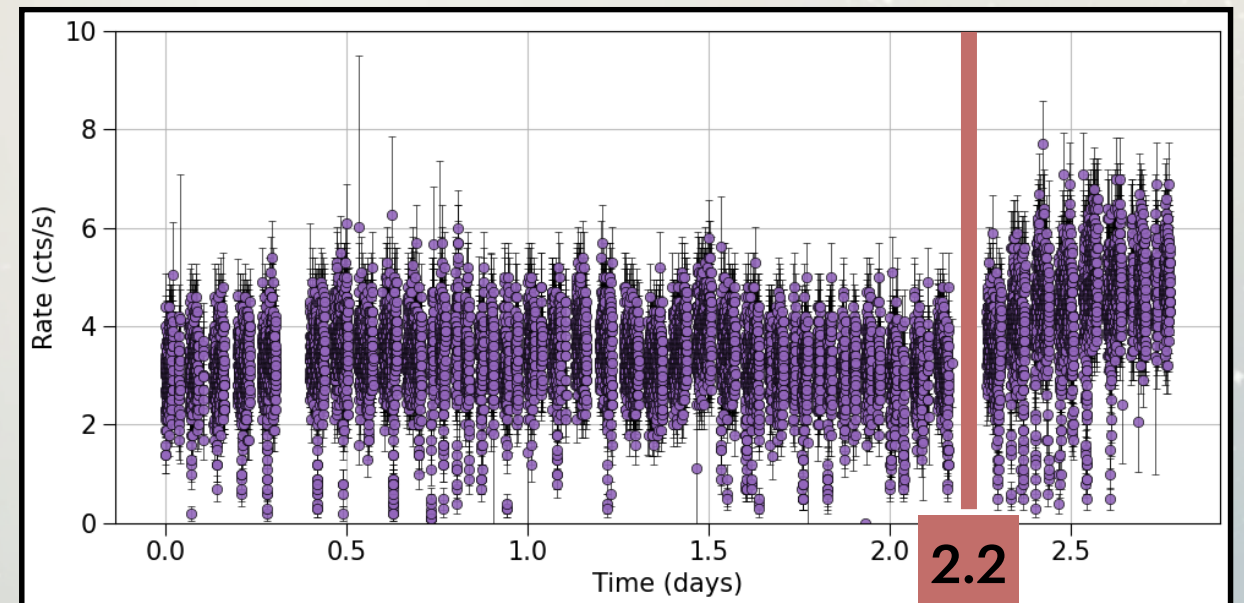
Phase resolved



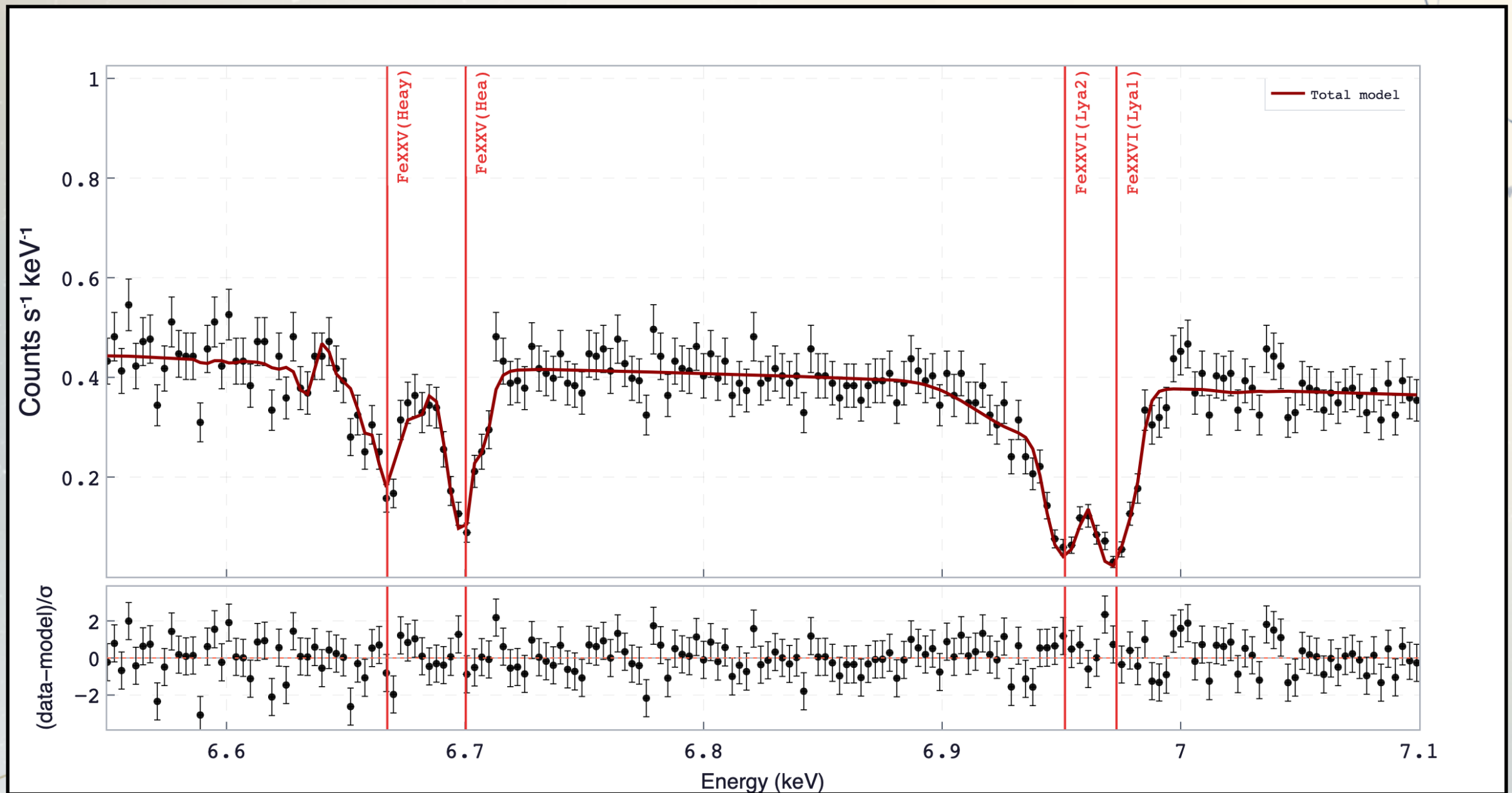
Persistent



Time resolved



PERSISTENT SPECTRUM: QUALITATIVELY INSPECTION





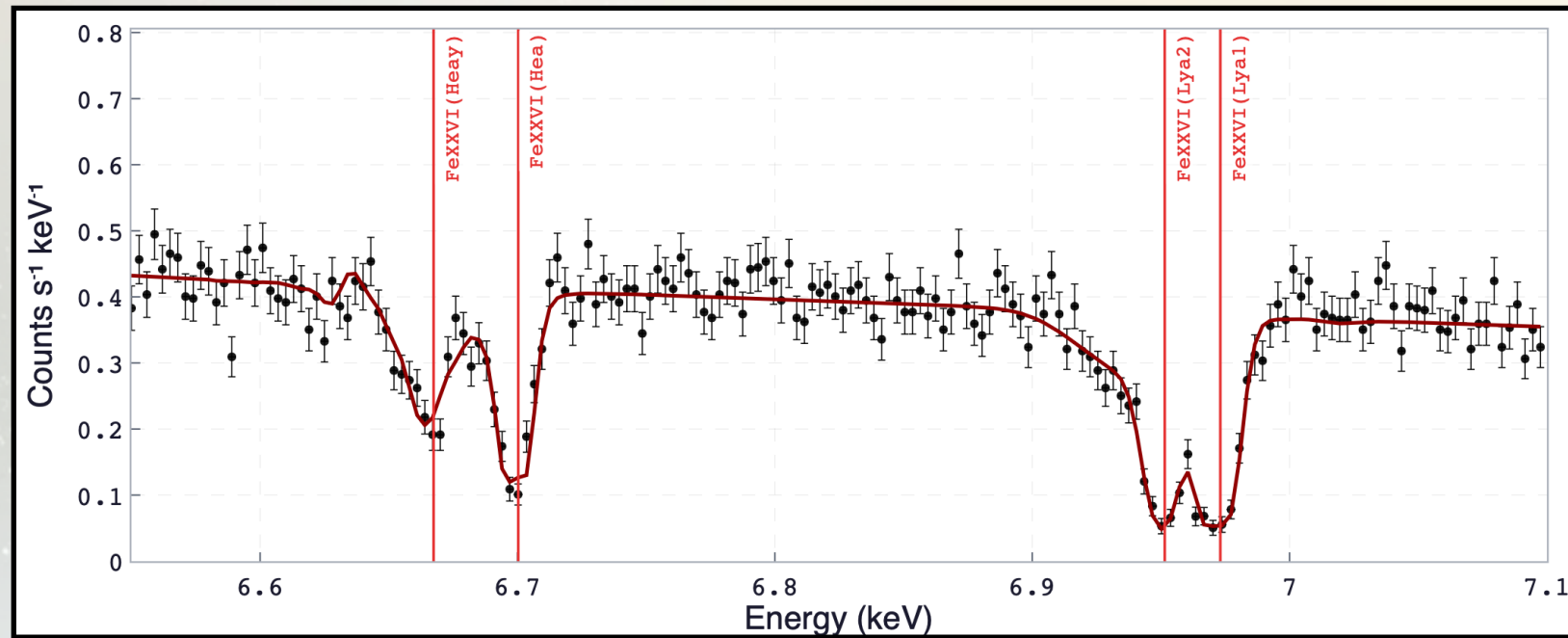
SPOT THE



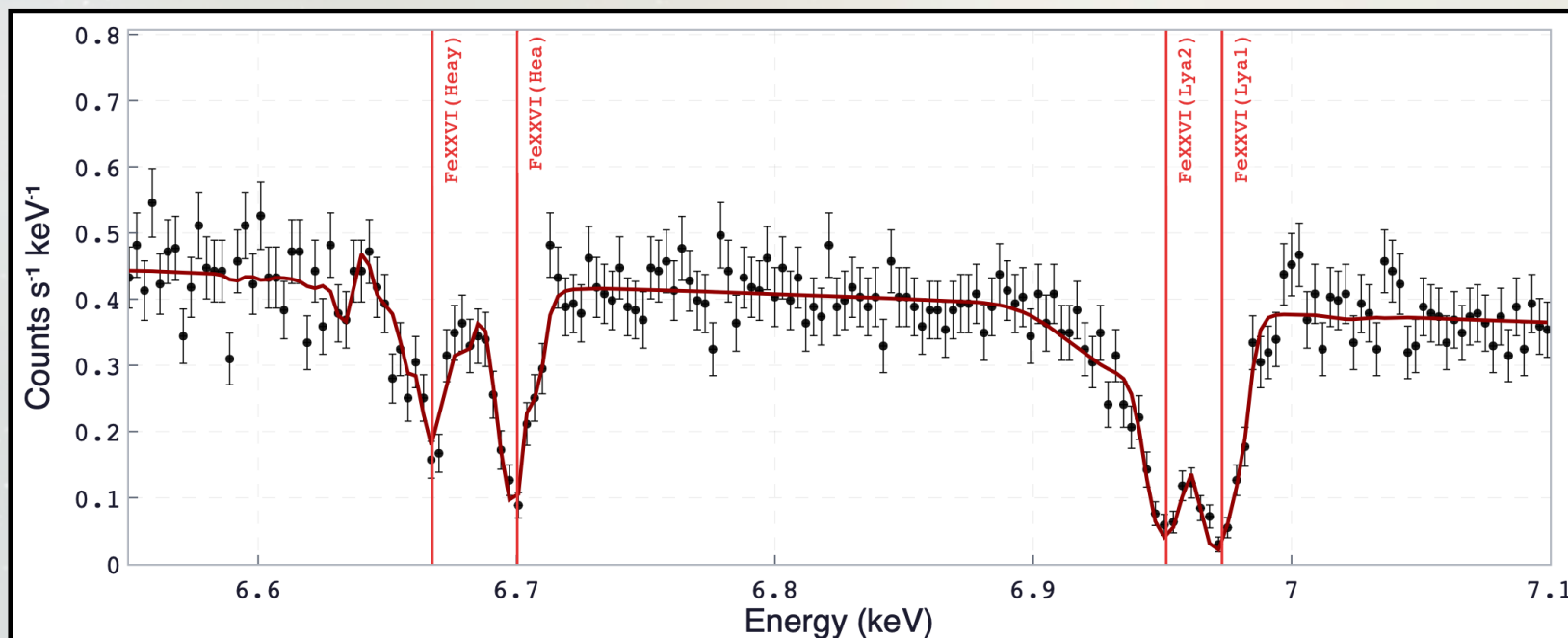
DIFFERENCES



SPOT THE DIFFERENCES

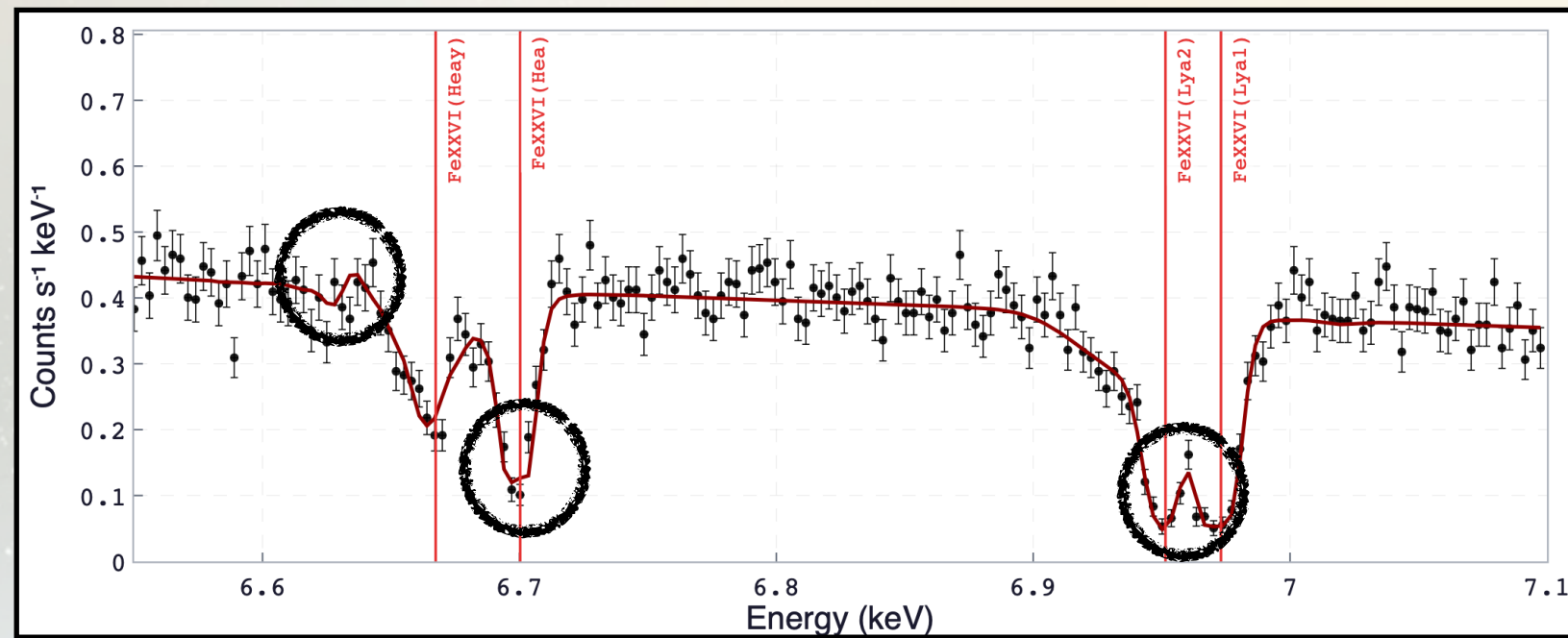


Full

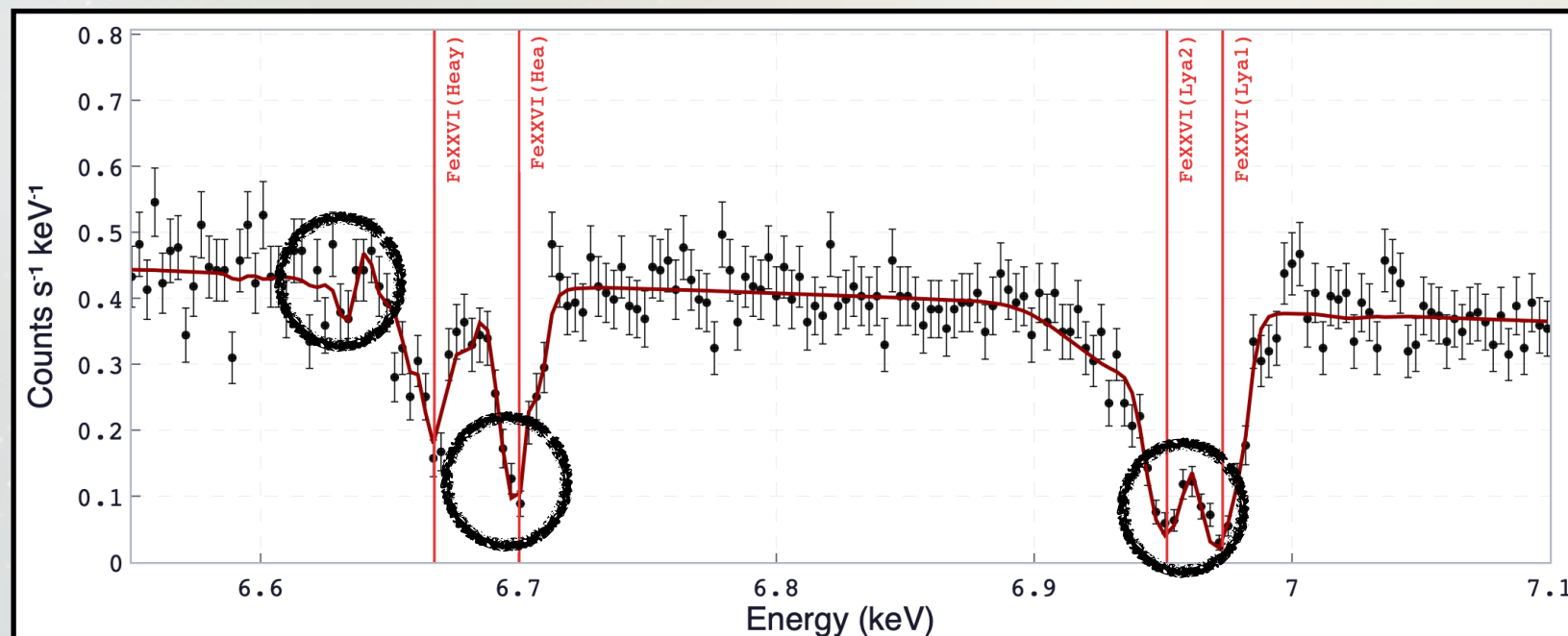


Persistent

SPOT THE DIFFERENCES

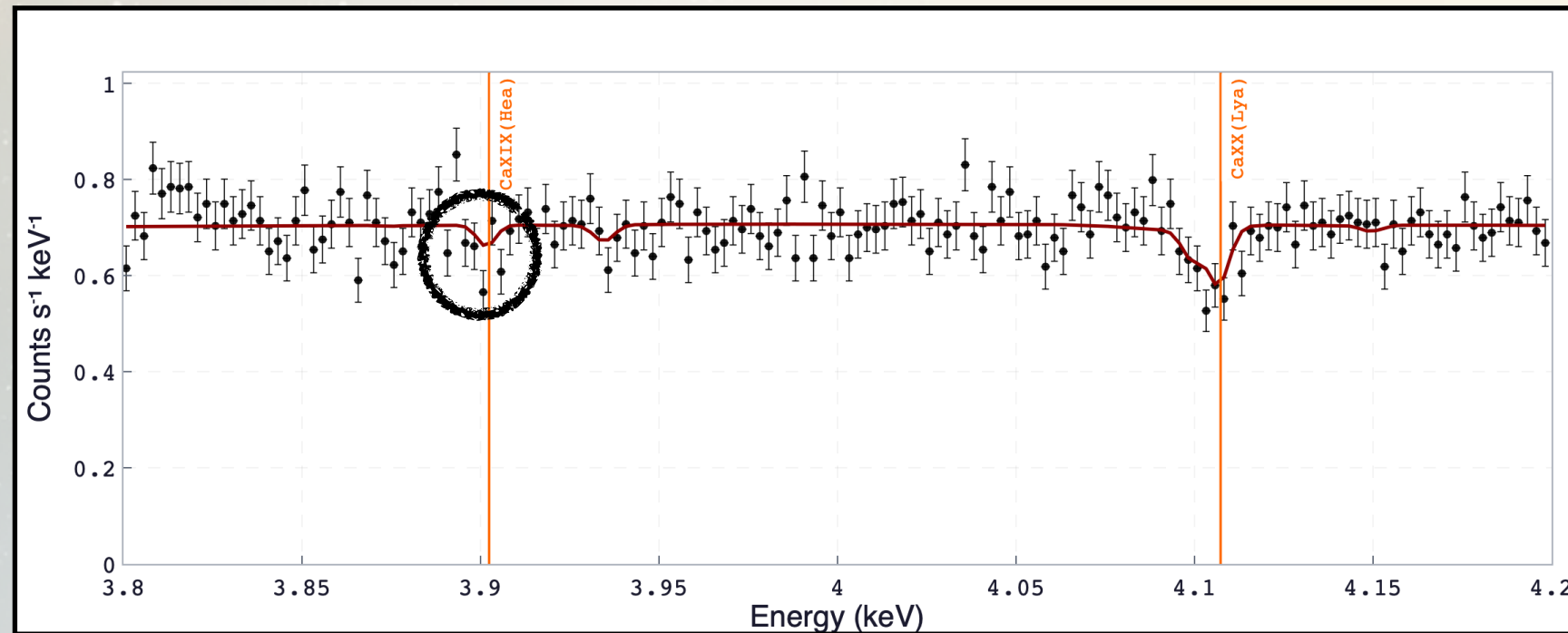


Full

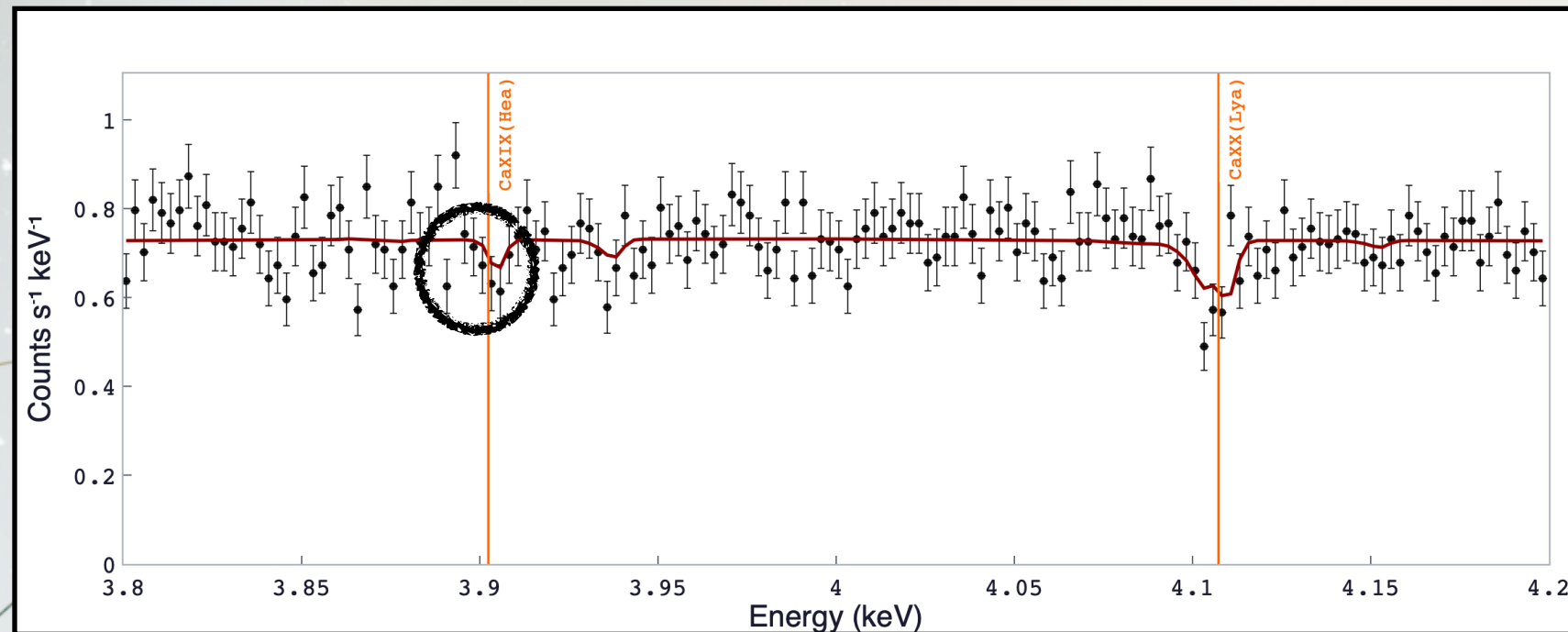


Persistent

SPOT THE DIFFERENCES

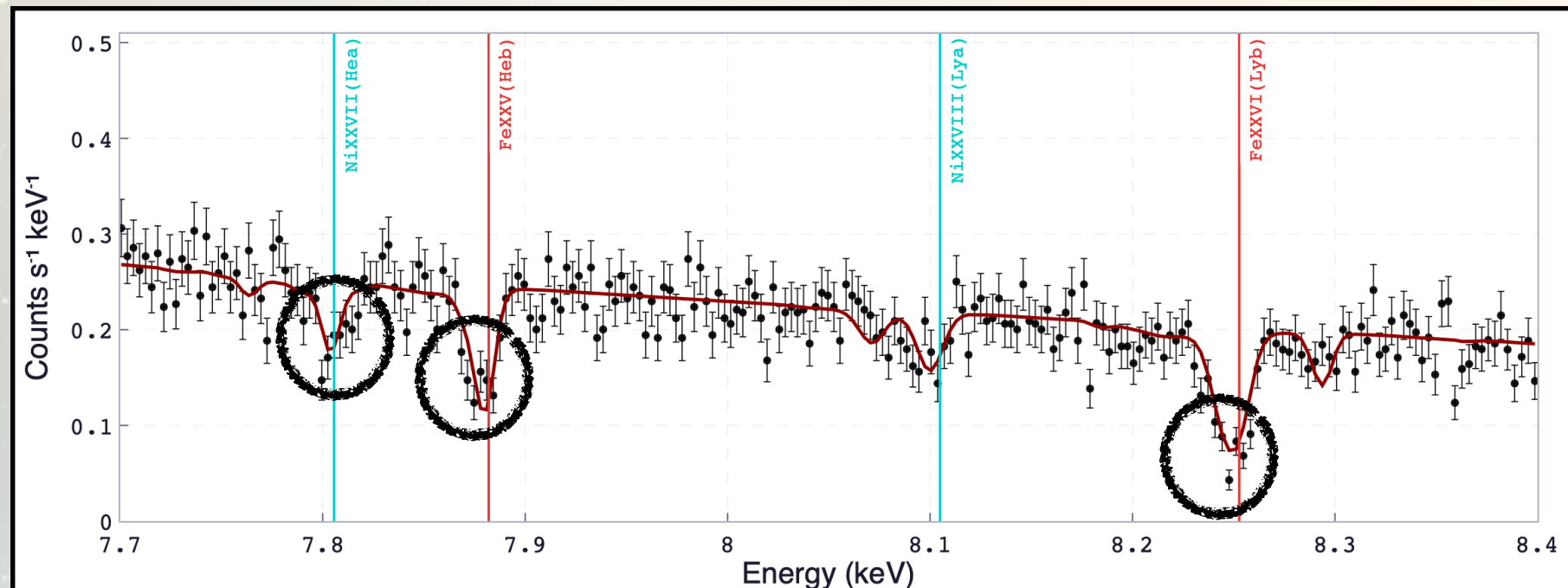


Full

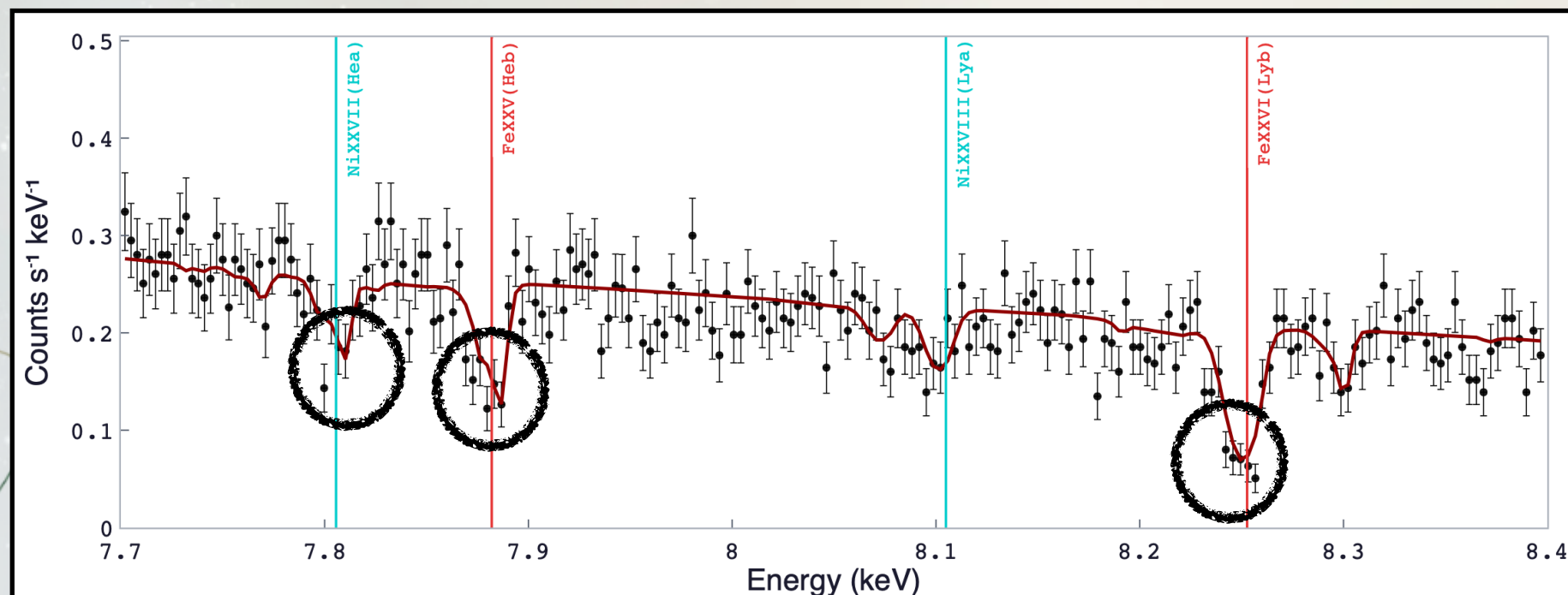


Persistent

SPOT THE DIFFERENCES

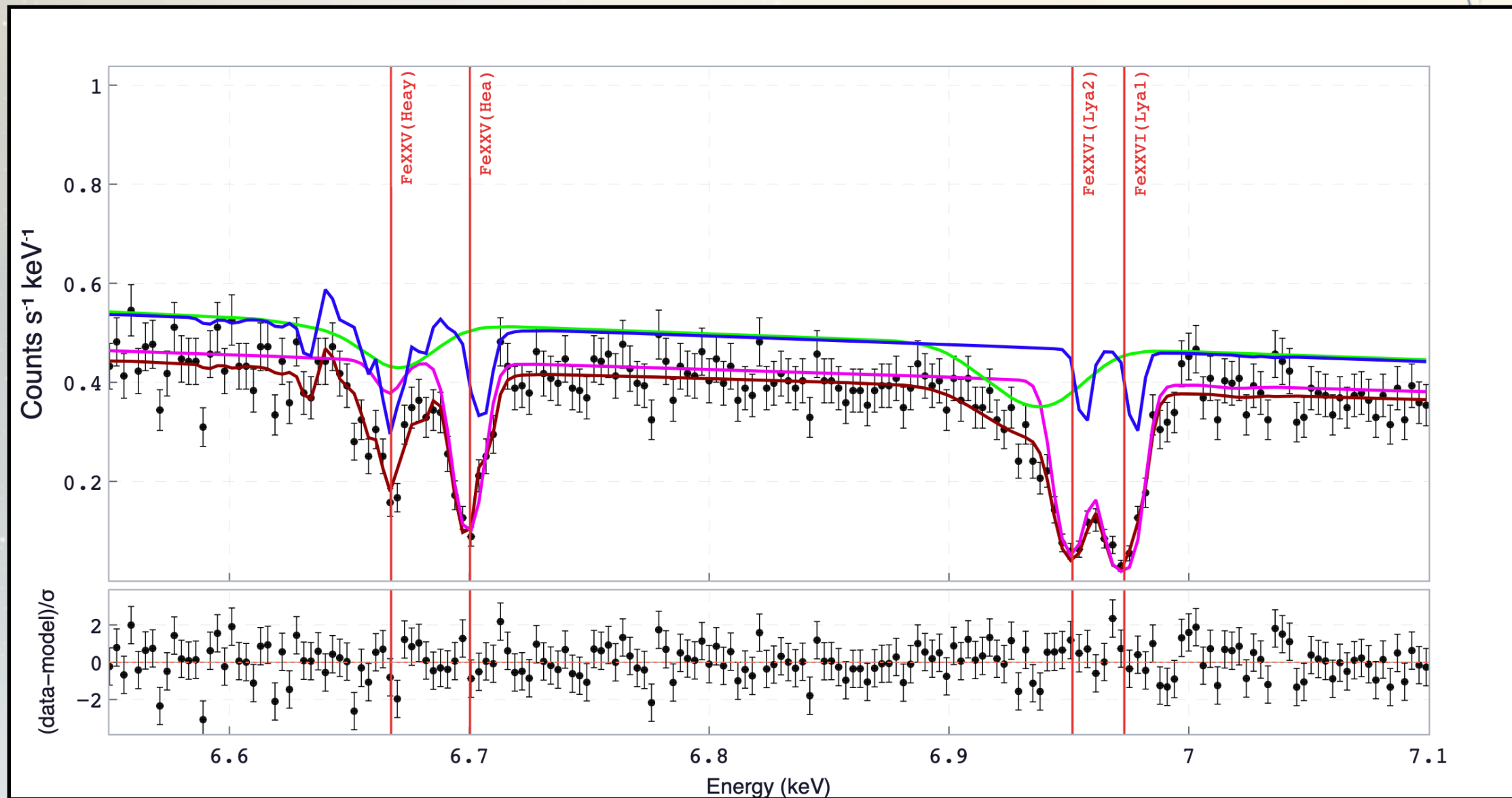


Full



Persistent

PERSISTENT SPECTRUM



$$\nu_{RMS} = 210^{+12}_{-19}$$

$$\nu_{BULK} = 38^{+18}_{-19}$$

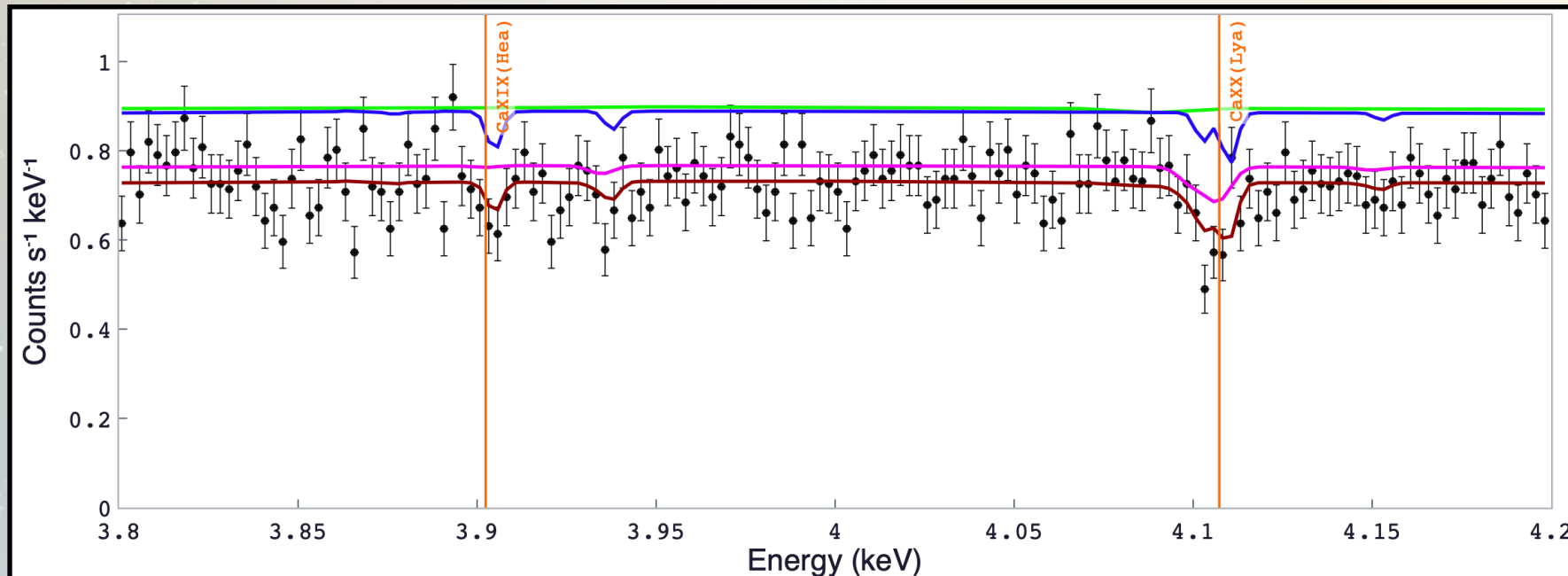
$$\nu_{RMS} = 604^{+255}_{-240}$$

$$\nu_{BULK} = 1388^{+305}_{-375}$$

$$\nu_{RMS} = 43^{+13}_{-12}$$

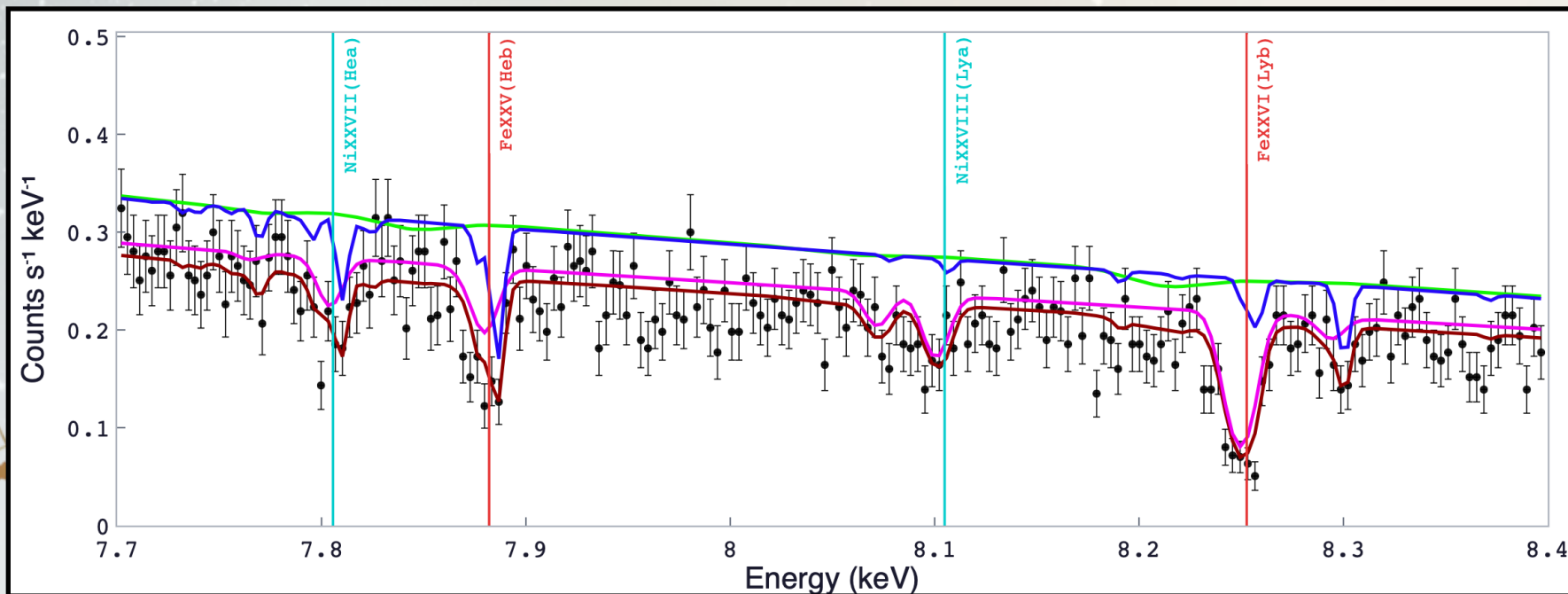
$$\nu_{BULK} = -193^{+20}_{-19}$$

PERSISTENT SPECTRUM



$$v_{RMS} = 210^{+12}_{-19}$$

$$v_{BULK} = 38^{+18}_{-19}$$



$$v_{RMS} = 604^{+255}_{-240}$$

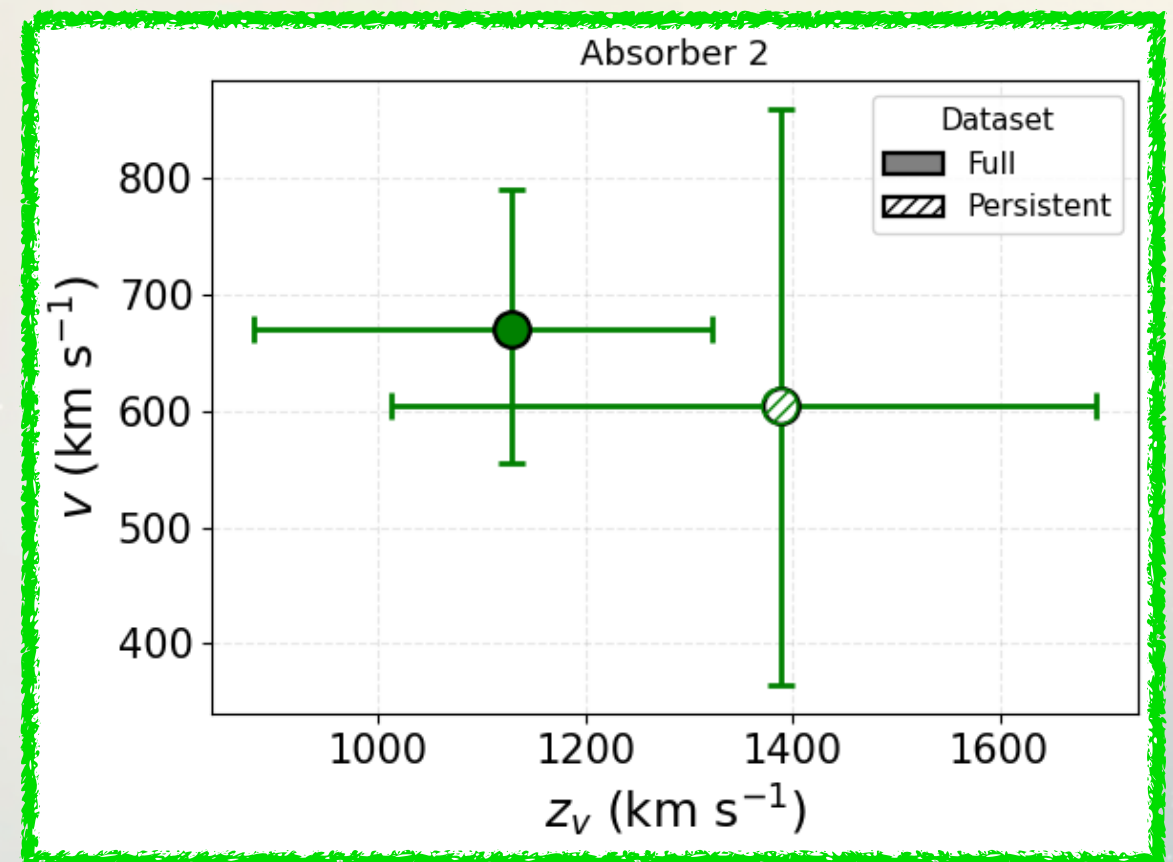
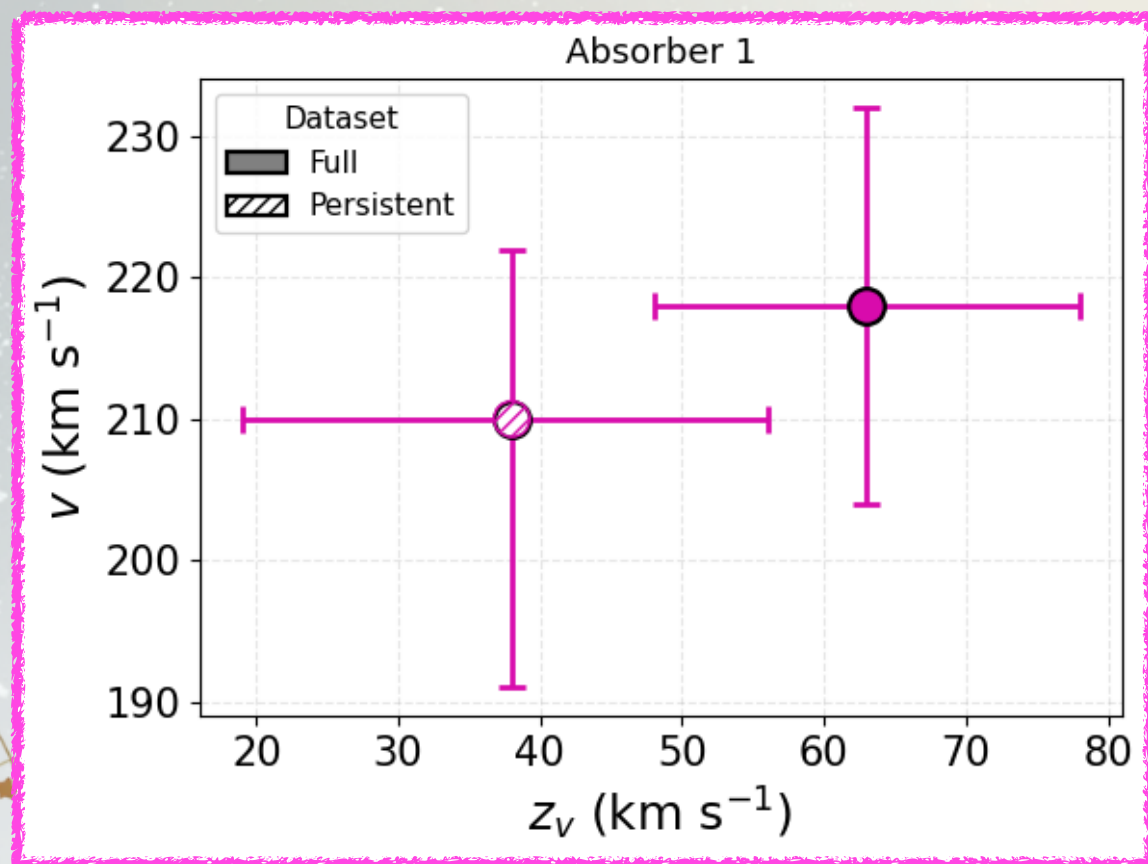
$$v_{BULK} = 1388^{+305}_{-375}$$

$$v_{RMS} = 43^{+13}_{-12}$$

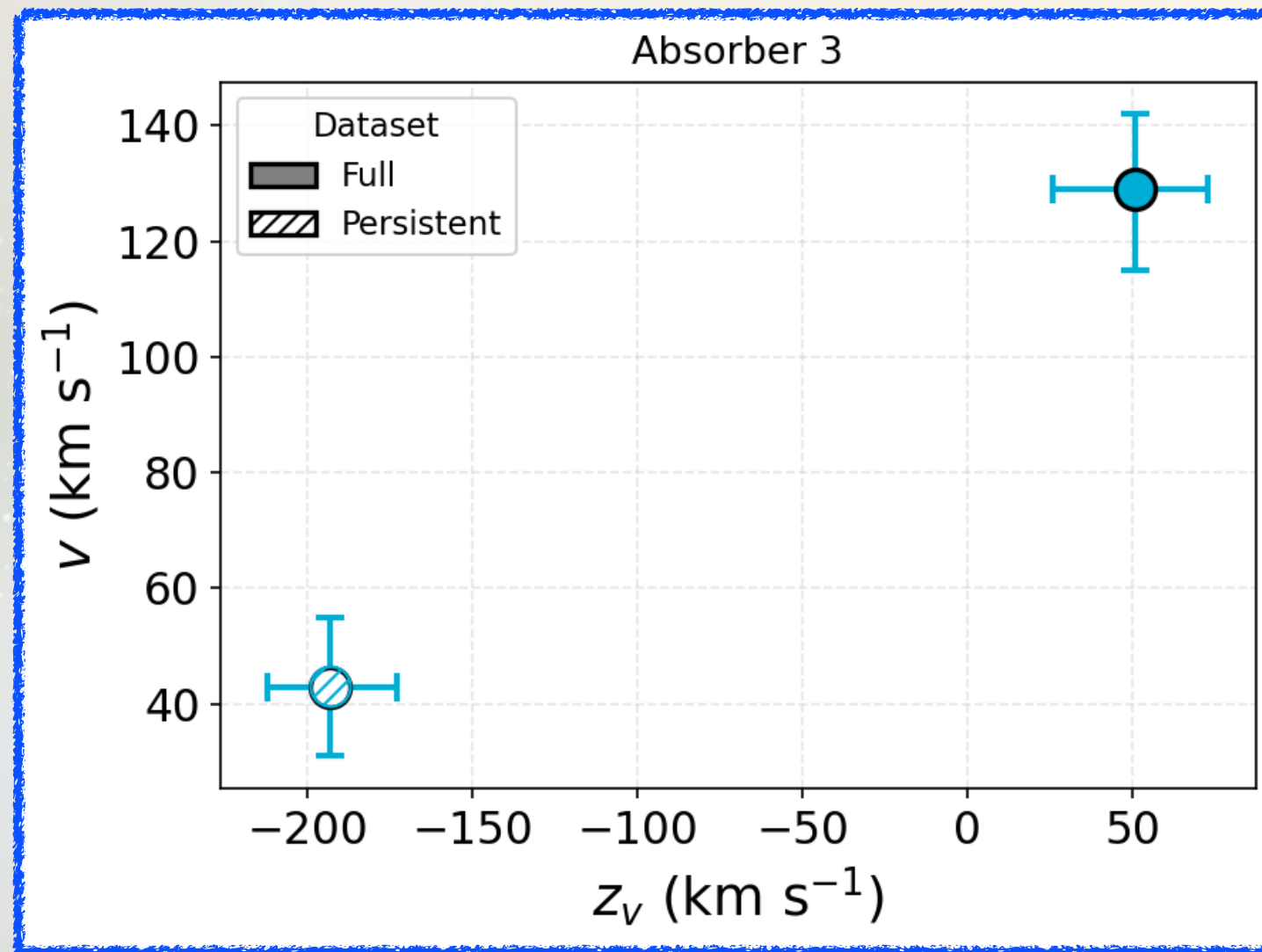
$$v_{BULK} = -193^{+20}_{-19}$$

IT'S NOT WHAT YOU HAVE...

....IT'S WHAT YOU ARE THAT MATTERS!



THE EXCEPTION THAT PROBES THE RULE



WHAT DID WE LEARN

3 STATES OF THE PLASMA

DEGENERACY

RED WING

DIPS RELEVANT ONLY FOR THIRD ABSORBER



Blueshifted feature

WHAT ARE THE QUESTIONS LEFT

3 STATES OF THE PLASMA

WHERE ARE THEY?

DEGENERACY

CAN WE IMPROVE IT?

RED WING

WHAT DOES IT MEAN? FAILED WIND?

DIPS RELEVANT ONLY FOR THIRD ABSORBER

IS THE DIP THE REAL CAUSE OF THE BLUESHIFT DISAPPEARANCE?

WHY?

Blueshifted feature

IS THERE A WIND?

WHAT ARE THE QUESTIONS LEFT

3 STATES OF THE PLASMA

WHERE ARE THEY?

DEGENERACY

CAN WE IMPROVE IT?

RED WING

WHAT DOES IT MEAN? FAILED WIND?

DIPS RELEVANT ONLY FOR THIRD ABSORBER

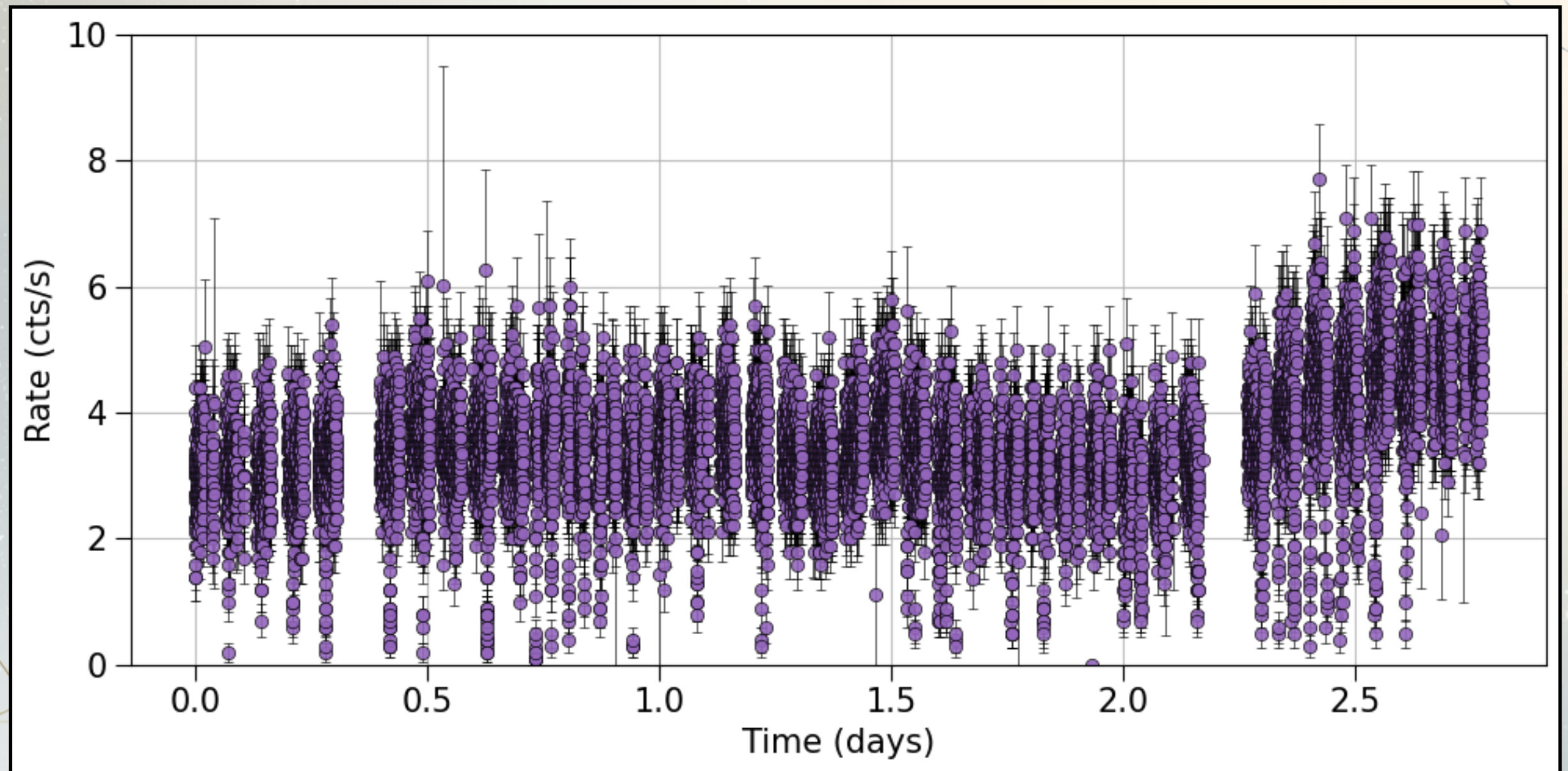
IS THE DIP THE REAL CAUSE OF THE BLUESHIFT DISAPPEARANCE?

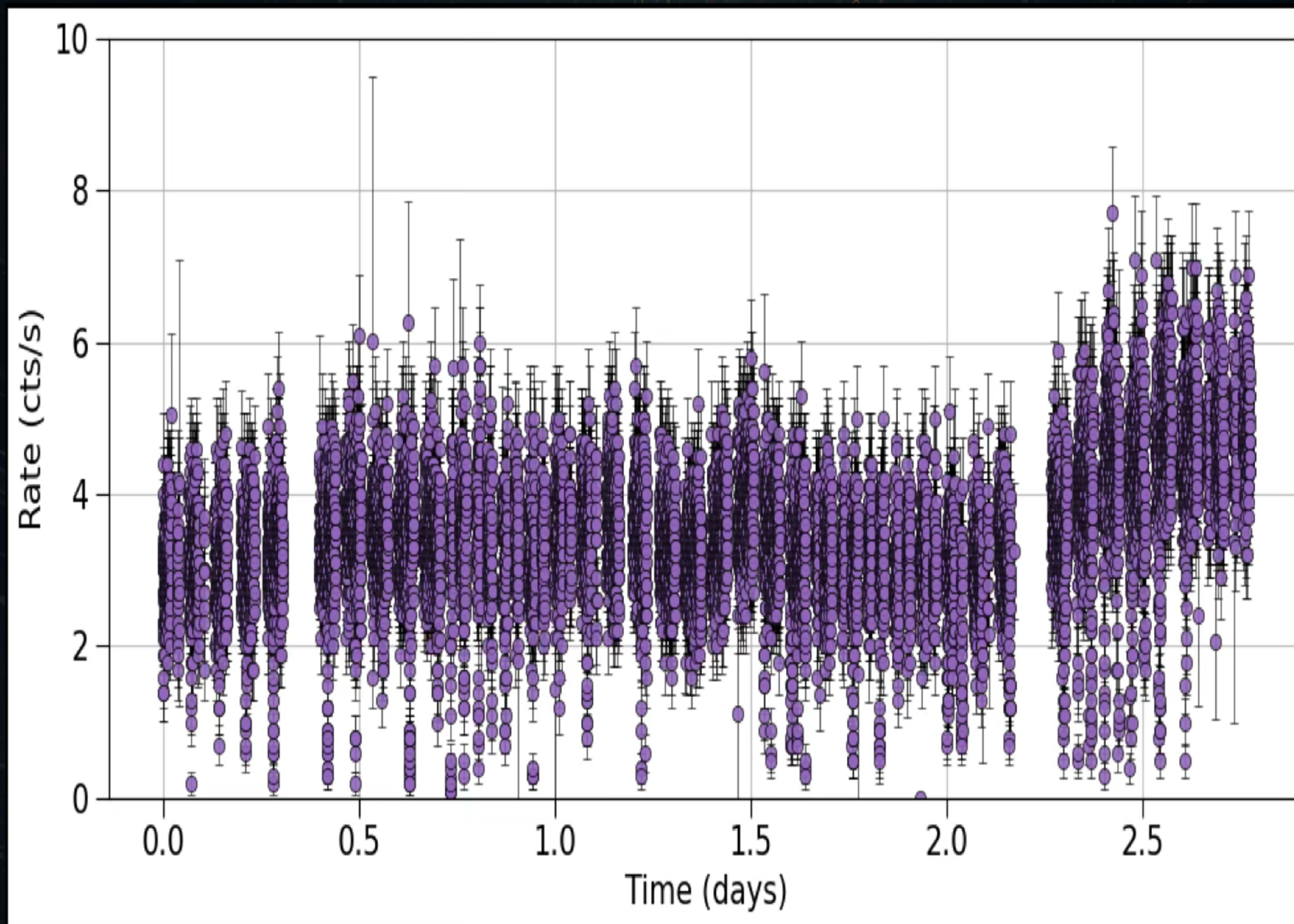
WHY?

Blueshifted feature

IS THERE A WIND?

SPECTRAL ANALYSIS





What is the main reason for the blue-shifted appearance or disappearance?

A:

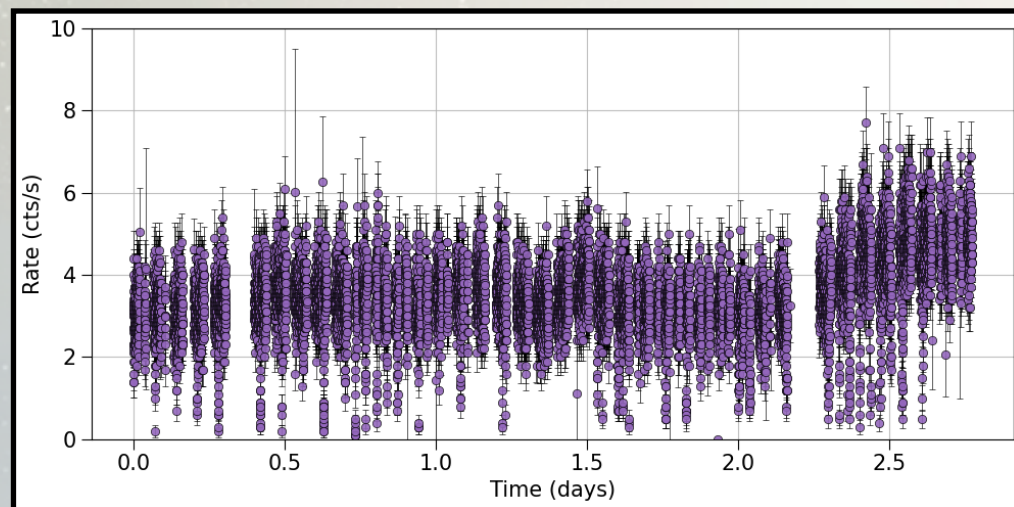
DIPS

B:

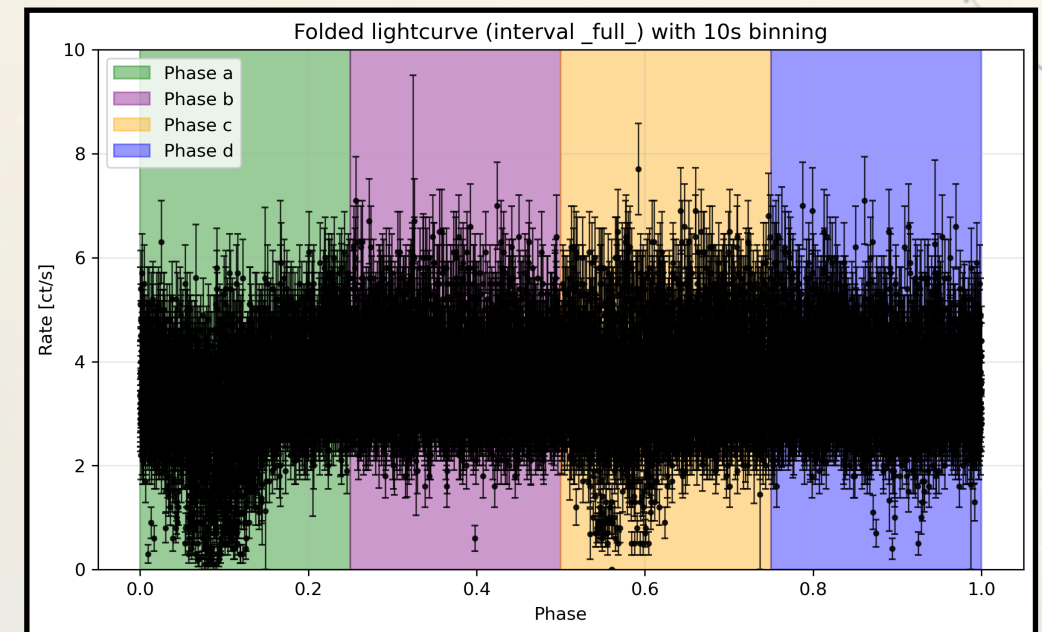
RATE

SPECTRAL ANALYSIS

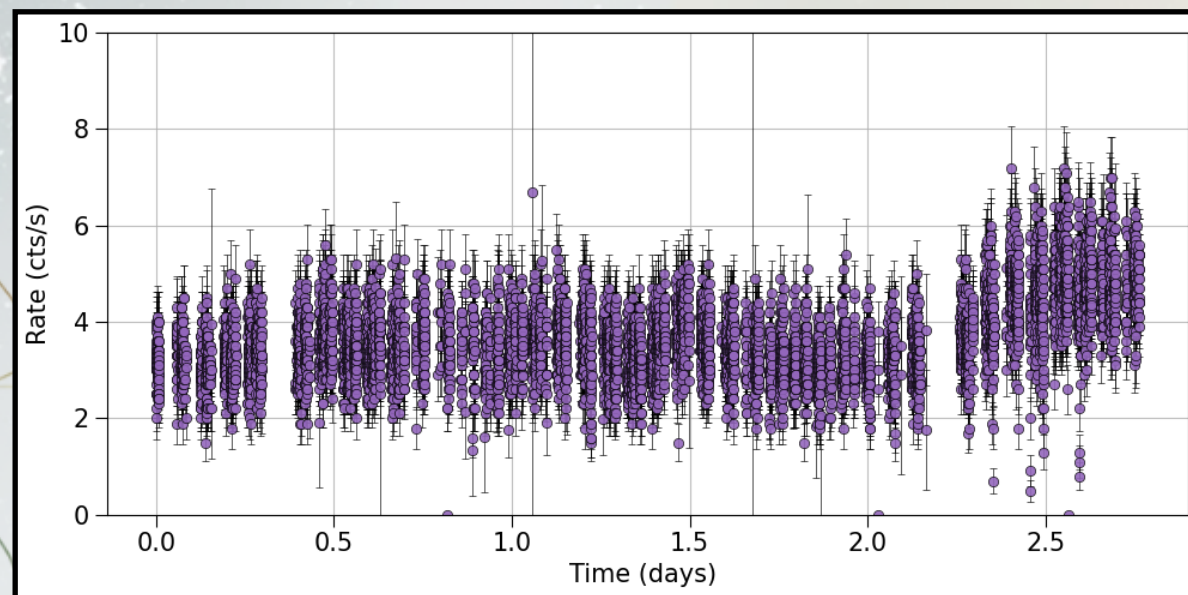
Full light curve



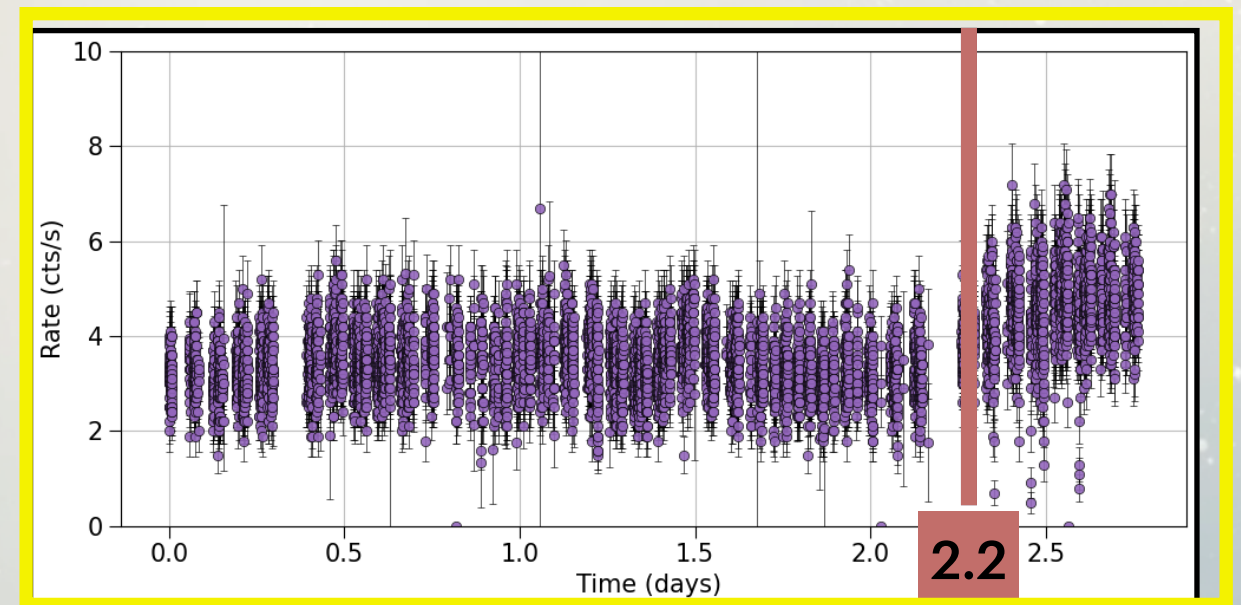
Phase resolved



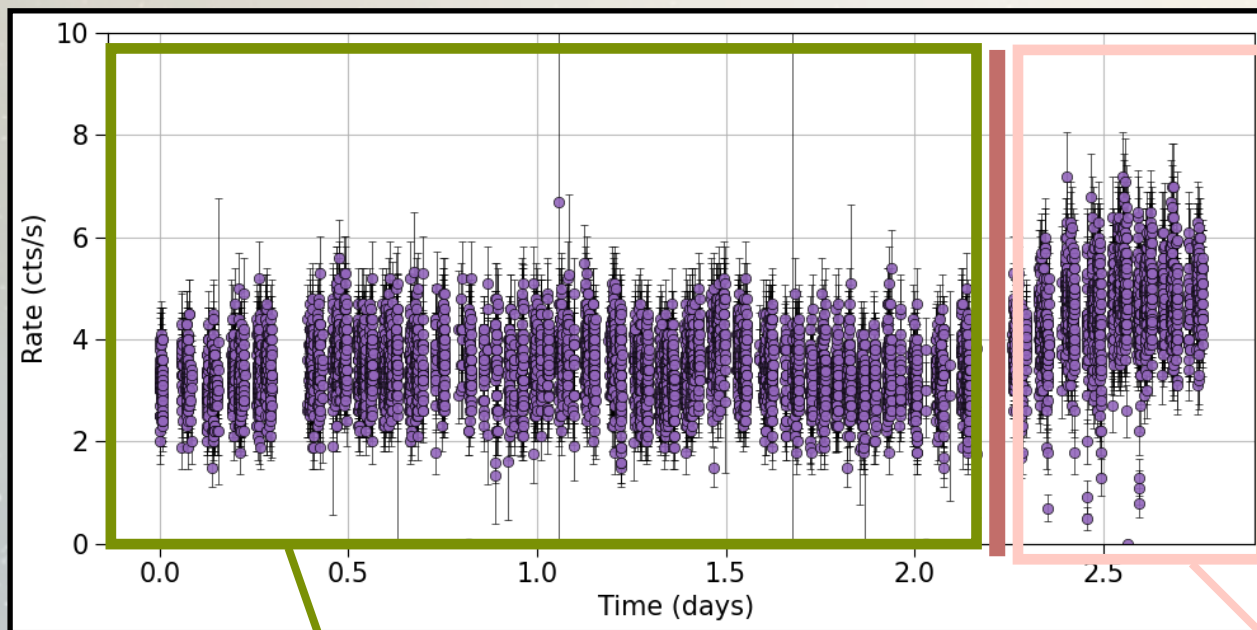
Persistent



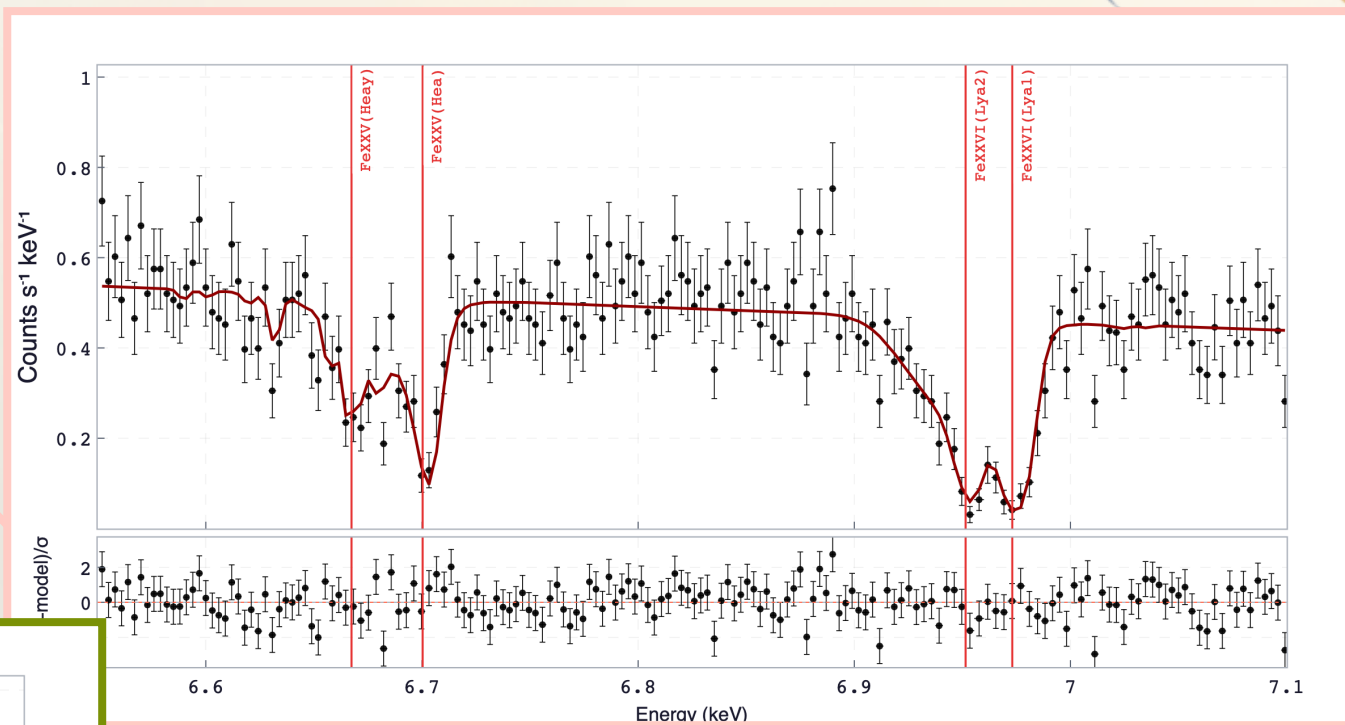
Time resolved



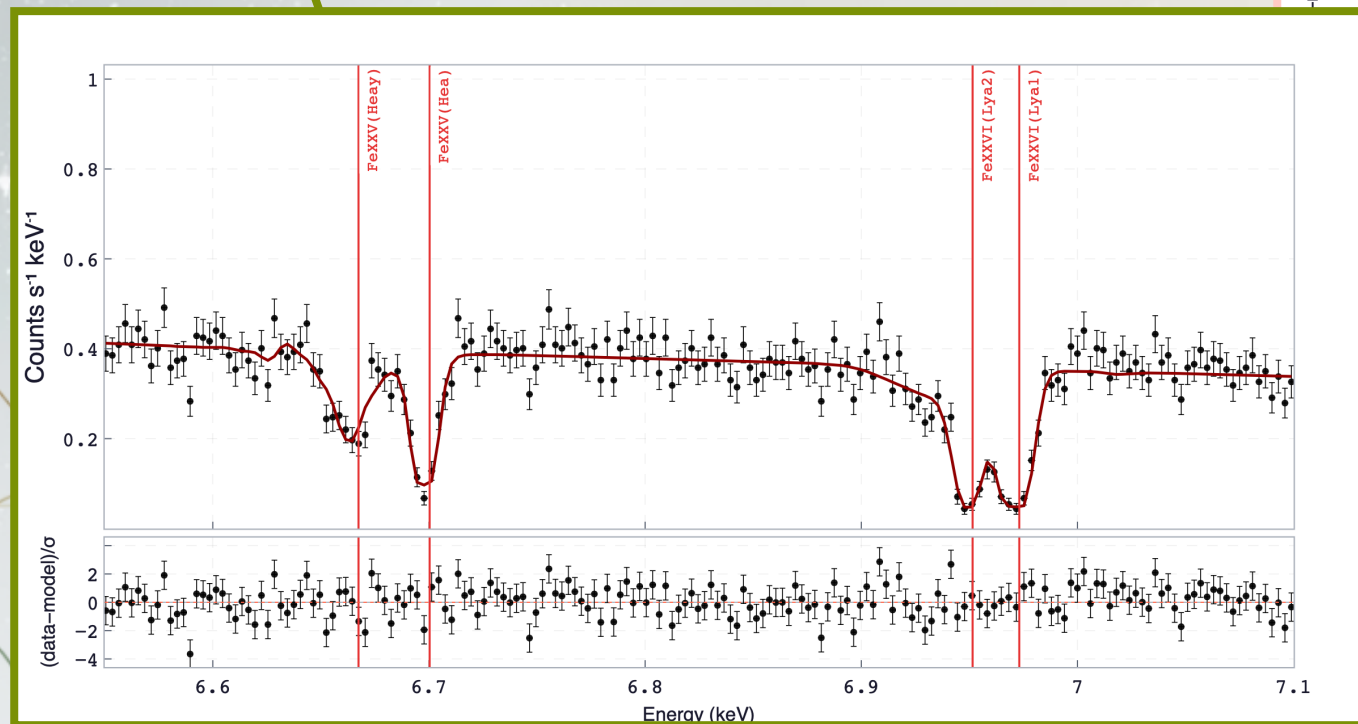
TIME SPECTRUM



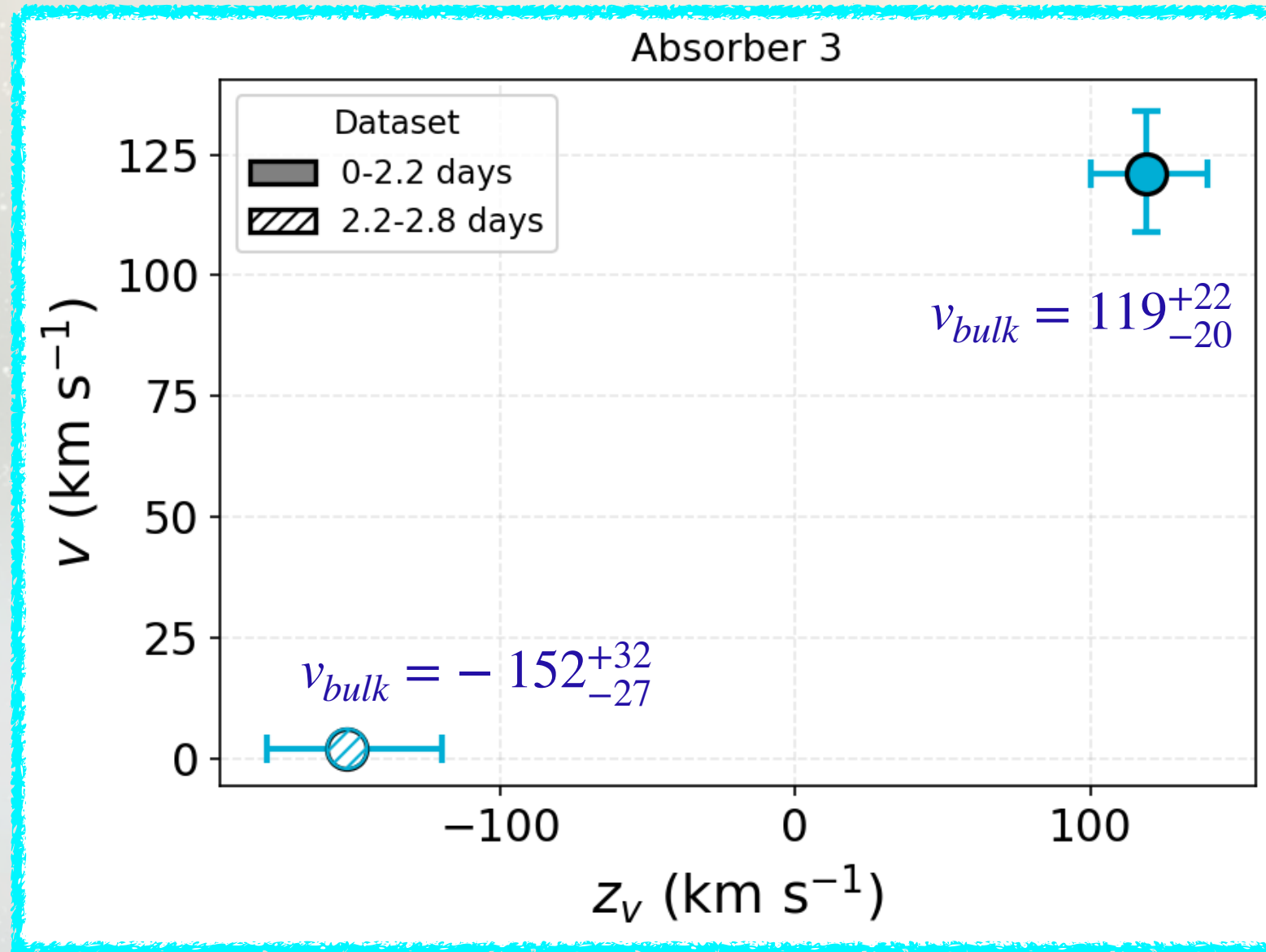
Spectrum 2.2-2.8 days



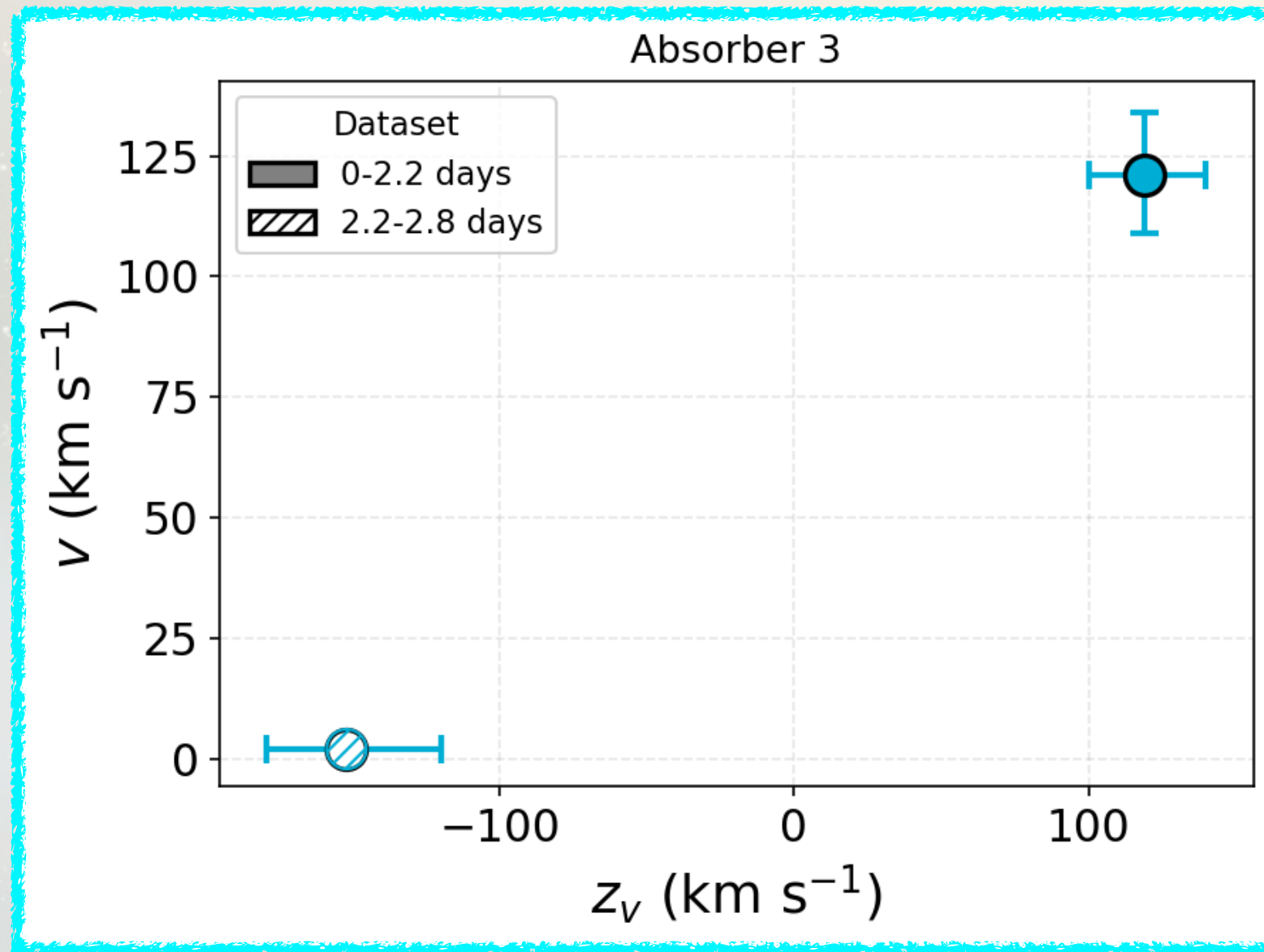
Spectrum 0-2.2 days



TIME SPECTRUM



TIME SPECTRUM



RATE

THE INCREASE IN FLUX IS RESPONSIBLE FOR THE BLUESHIFT

WHAT ARE THE QUESTIONS LEFT

3 STATES OF THE PLASMA

WHERE ARE THEY?

DEGENERACY

CAN WE IMPROVE IT?

RED WING

WHAT DOES IT MEAN? FAILED WIND?

DIPS RELEVANT ONLY FOR THIRD ABSORBER

IS THE DIP THE REAL CAUSE OF THE BLUESHIFT DISAPPEARANCE?

WHY?

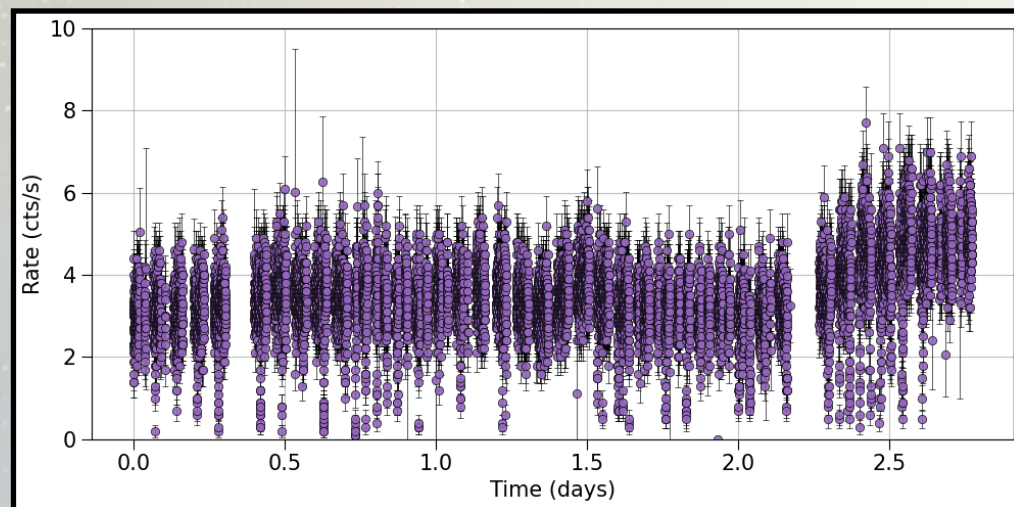
Blueshifted feature

IS THERE A WIND?

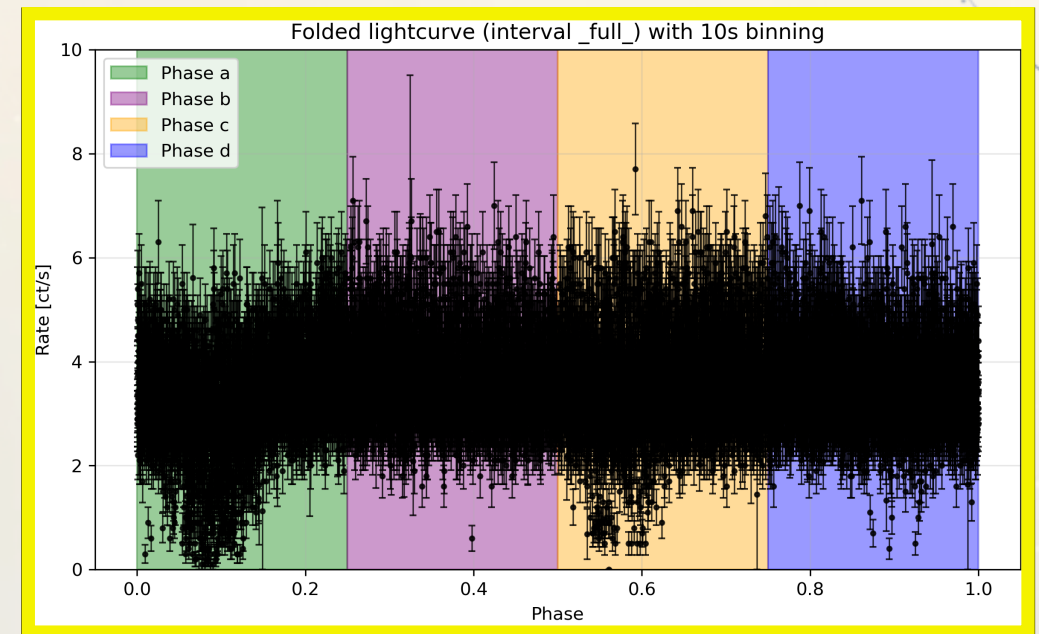
HOW DOES THE SPECTRA CHANGE IN PHASE?

SPECTRAL ANALYSIS

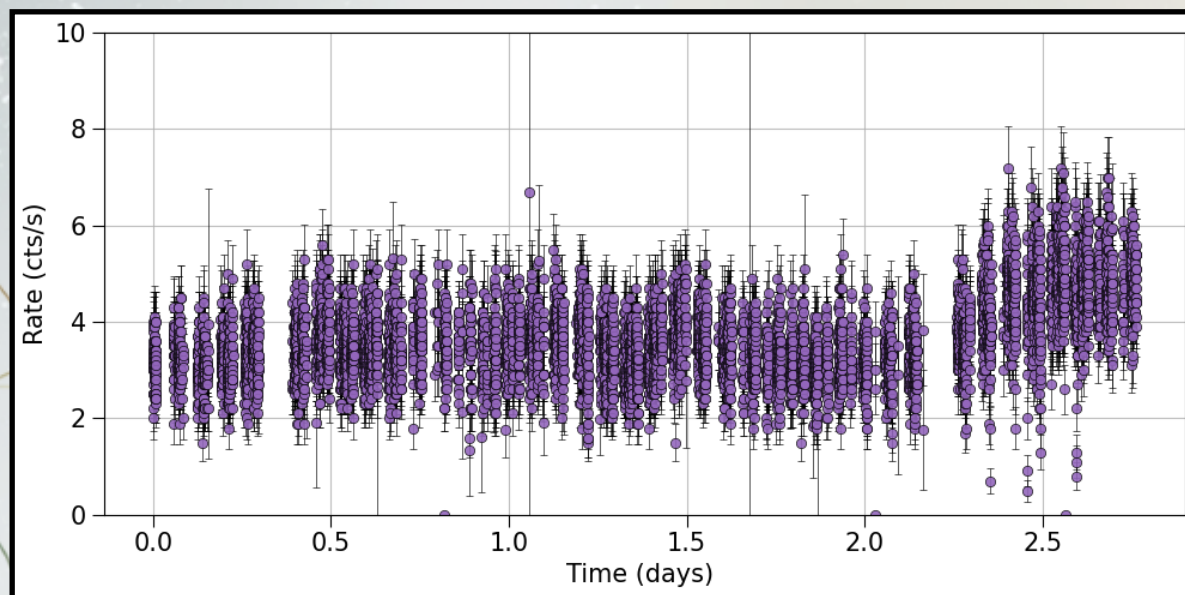
Full light curve



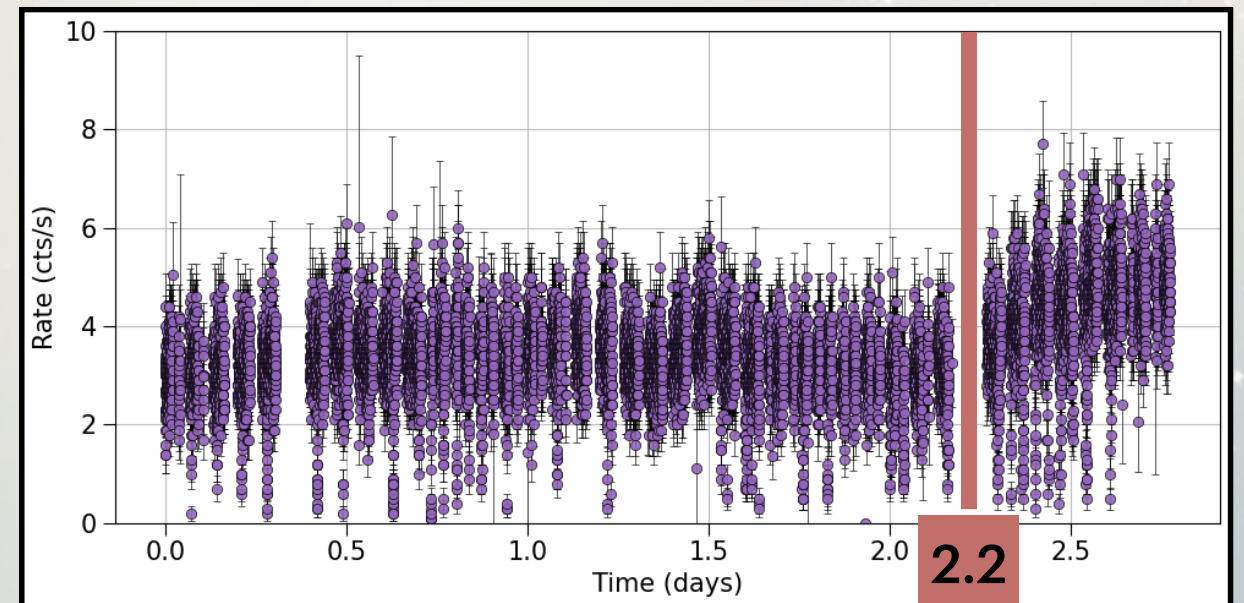
Phase resolved



Persistent

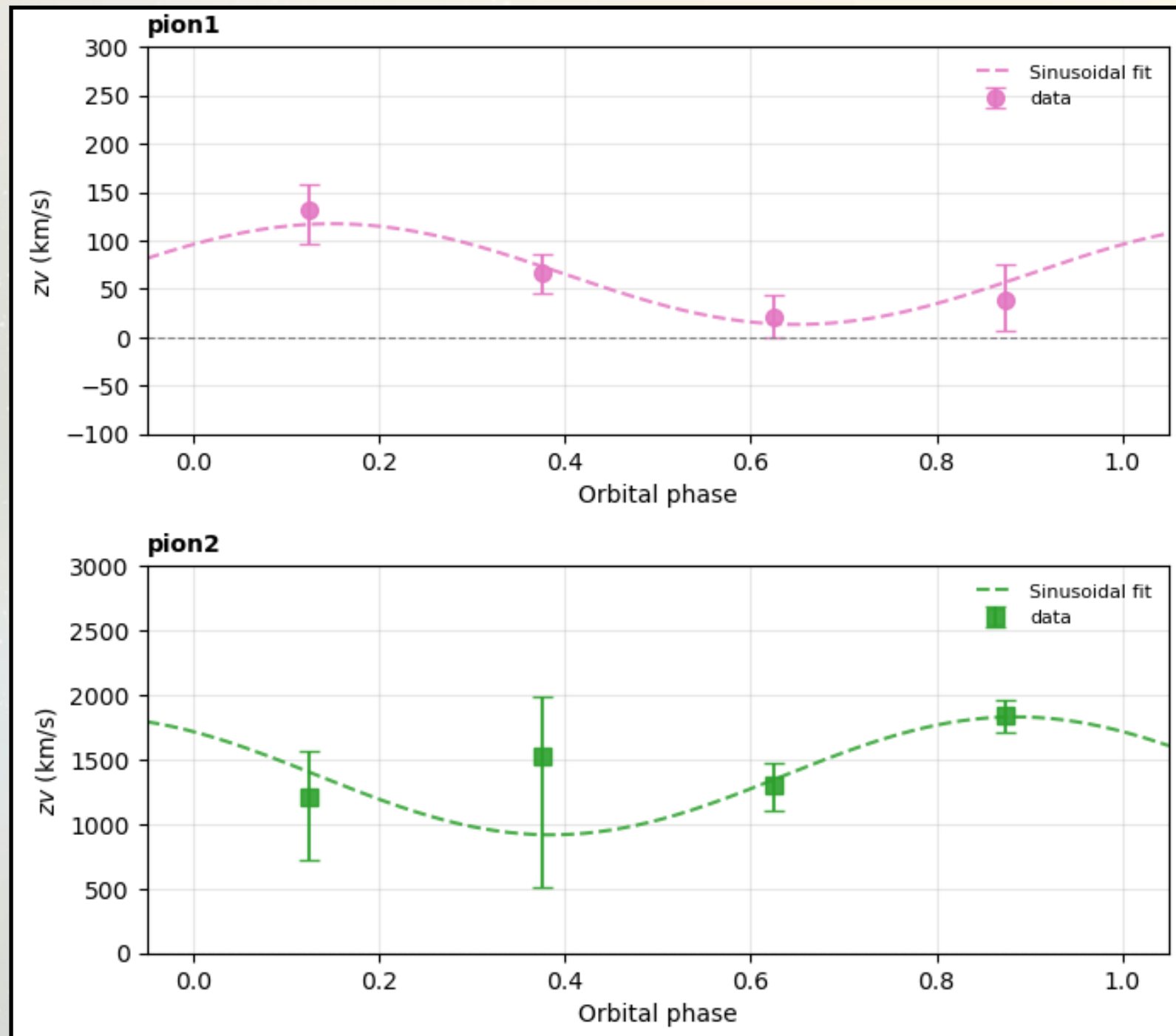


Time resolved



PHASE ANALYSIS: THE RADIAL CURVE

Accretion disk



Stream?

WHAT ARE THE QUESTIONS LEFT

3 STATES OF THE PLASMA

WHERE ARE THEY?

DEGENERACY

CAN WE IMPROVE IT?

RED WING

WHAT DOES IT MEAN? FAILED WIND?

DIPS RELEVANT ONLY FOR THIRD ABSORBER

IS THE DIP THE REAL CAUSE OF THE BLUESHIFT?

WHY?

Blueshifted feature

IS THERE A WIND?

SUMMARY AND CONCLUSIONS

3 STATES OF THE PLASMA

DEGENERACY

RED WING

DIPS RELEVANT ONLY FOR THIRD ABSORBER

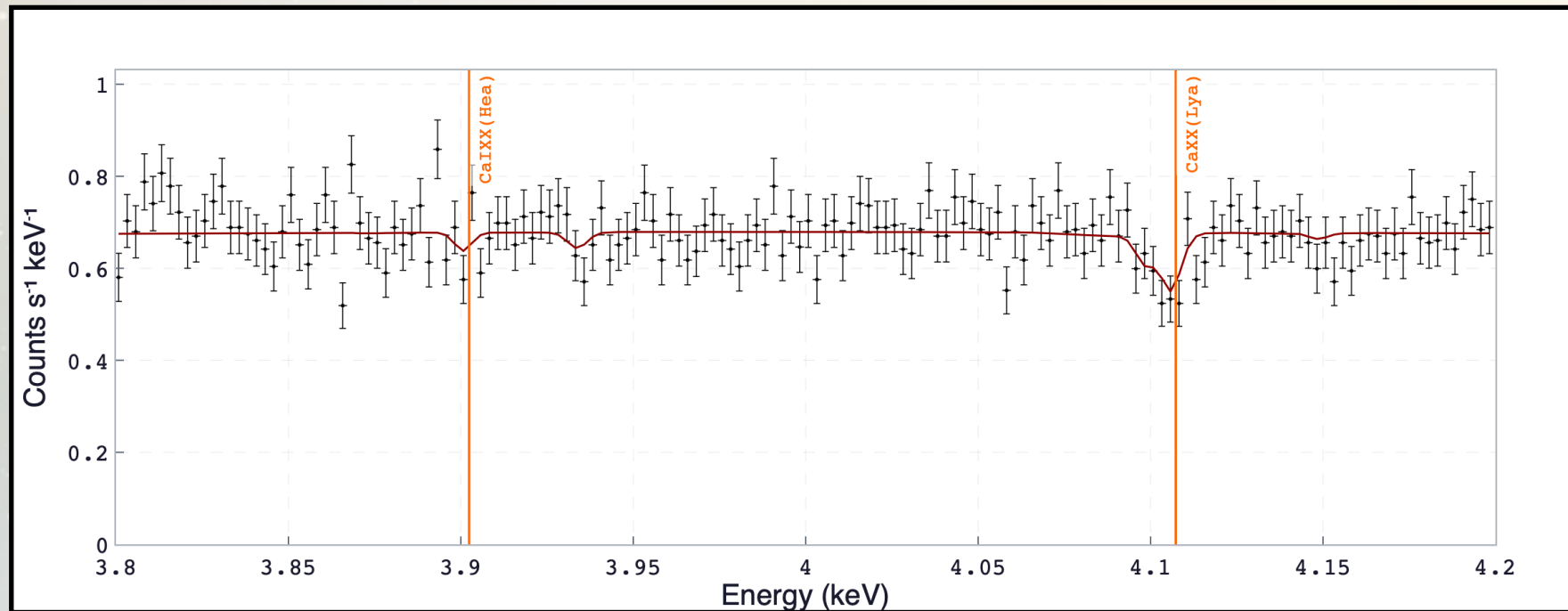
THE INCREASE IN FLUX IS RESPONSIBLE FOR THE BLUESHIFT

Precession?

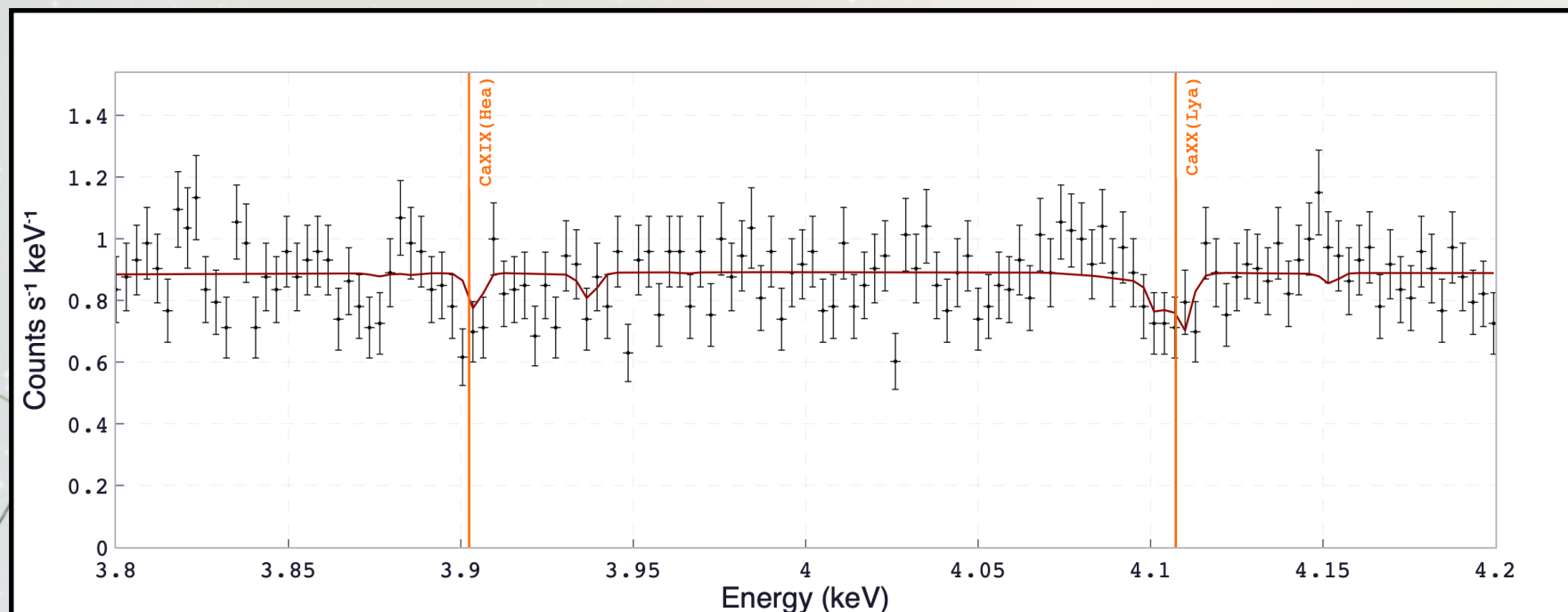
Blueshifted feature

BACKUP SLIDES

BACKUP SLIDES

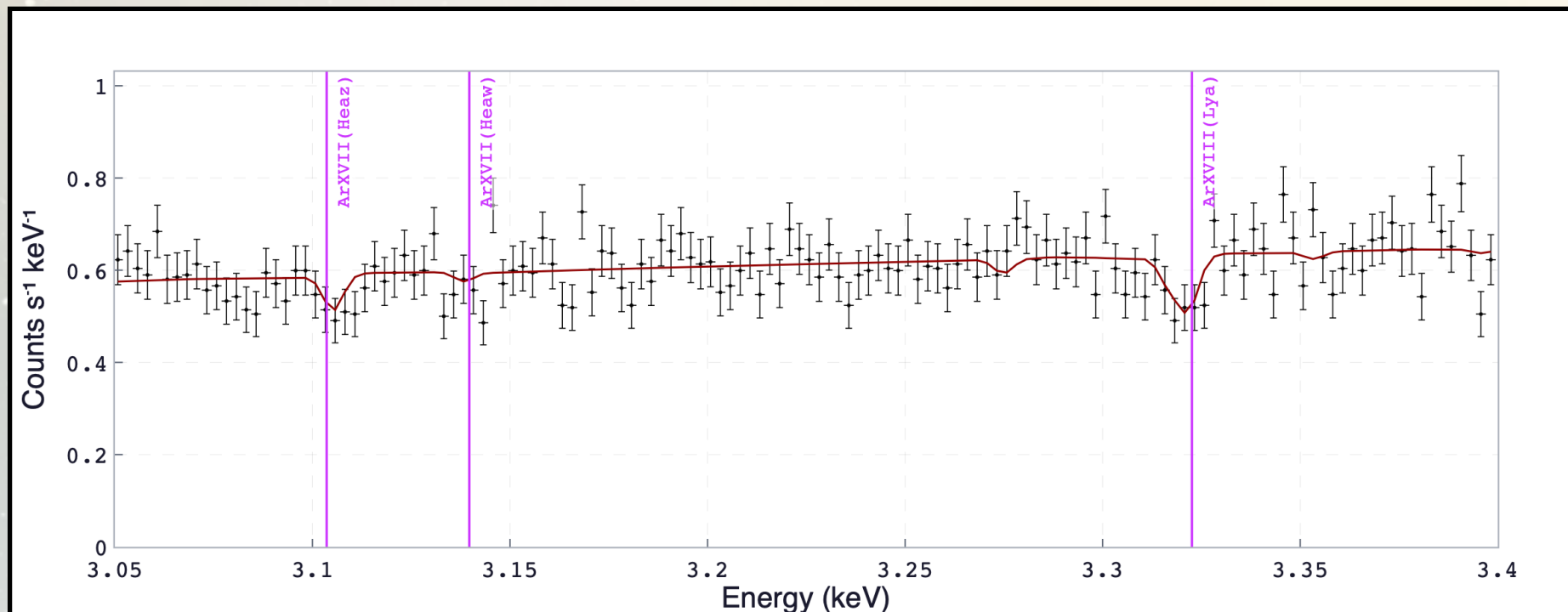


0.0-2.2 days

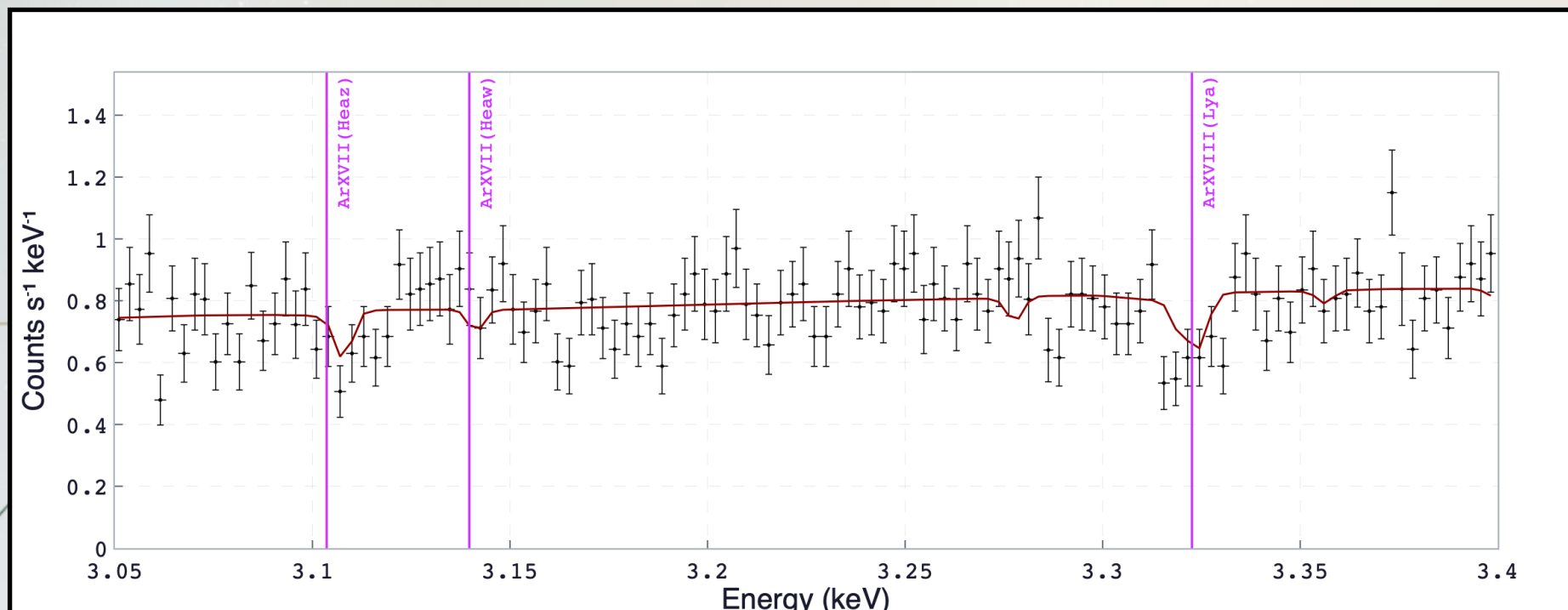


2.2-2.8 days

BACKUP SLIDES

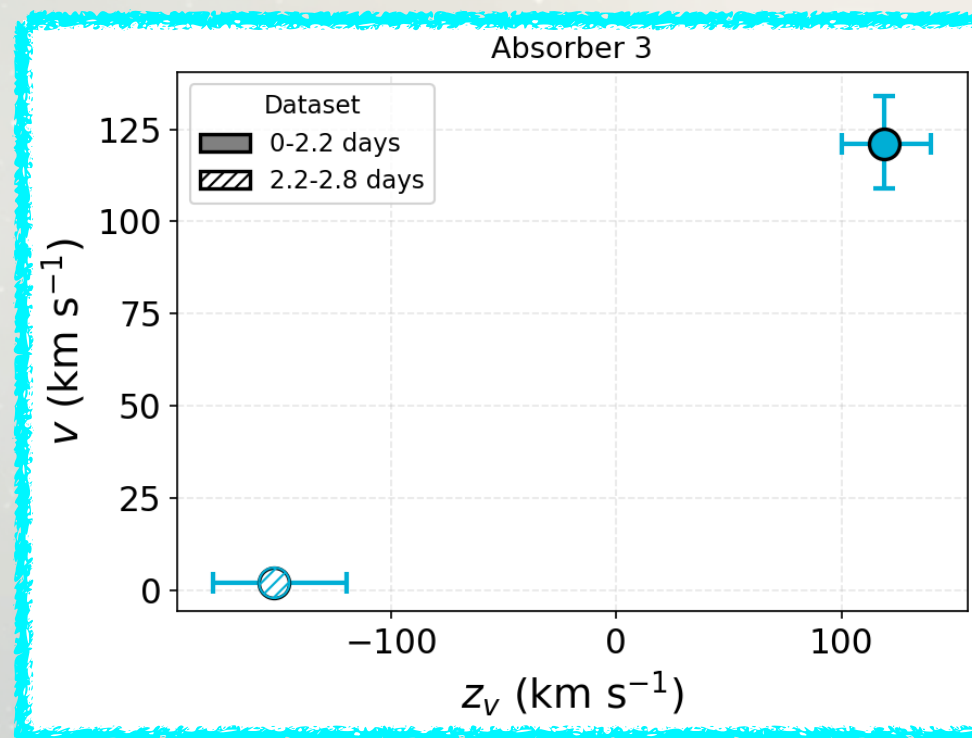
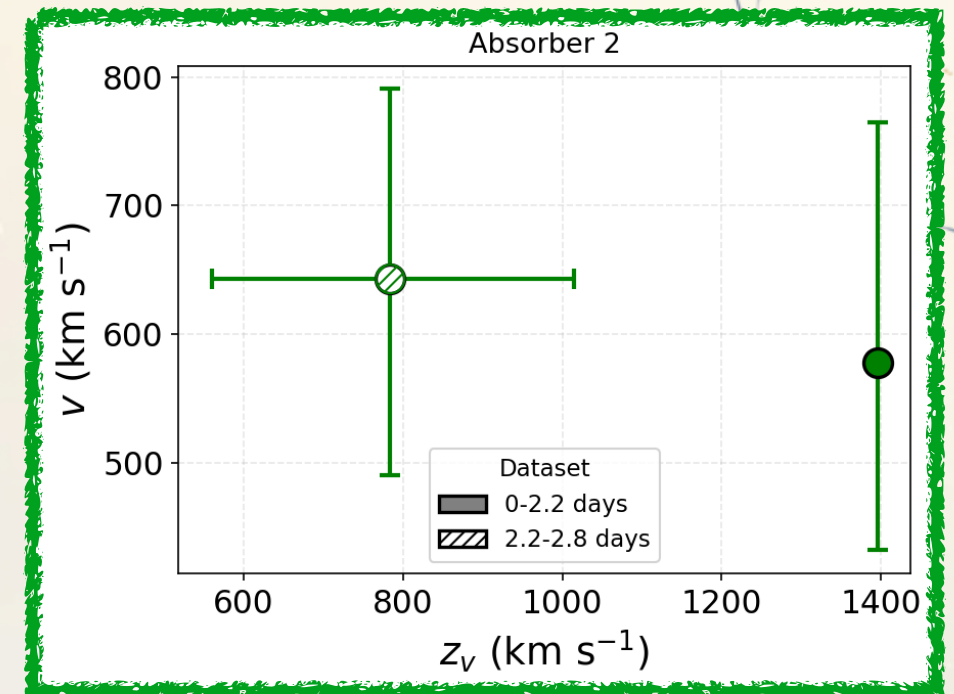
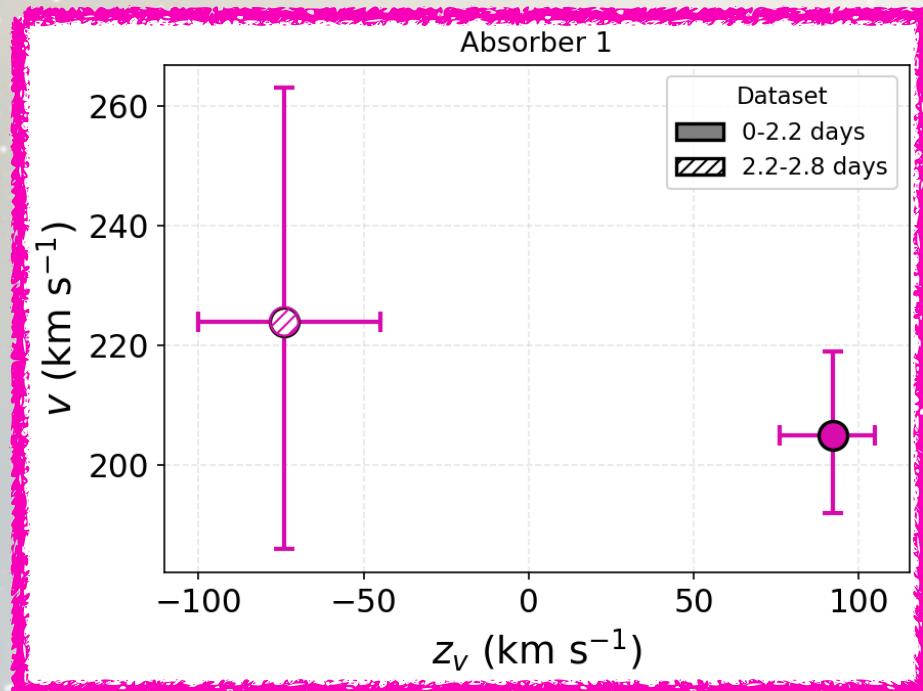


0.0-2.2 days

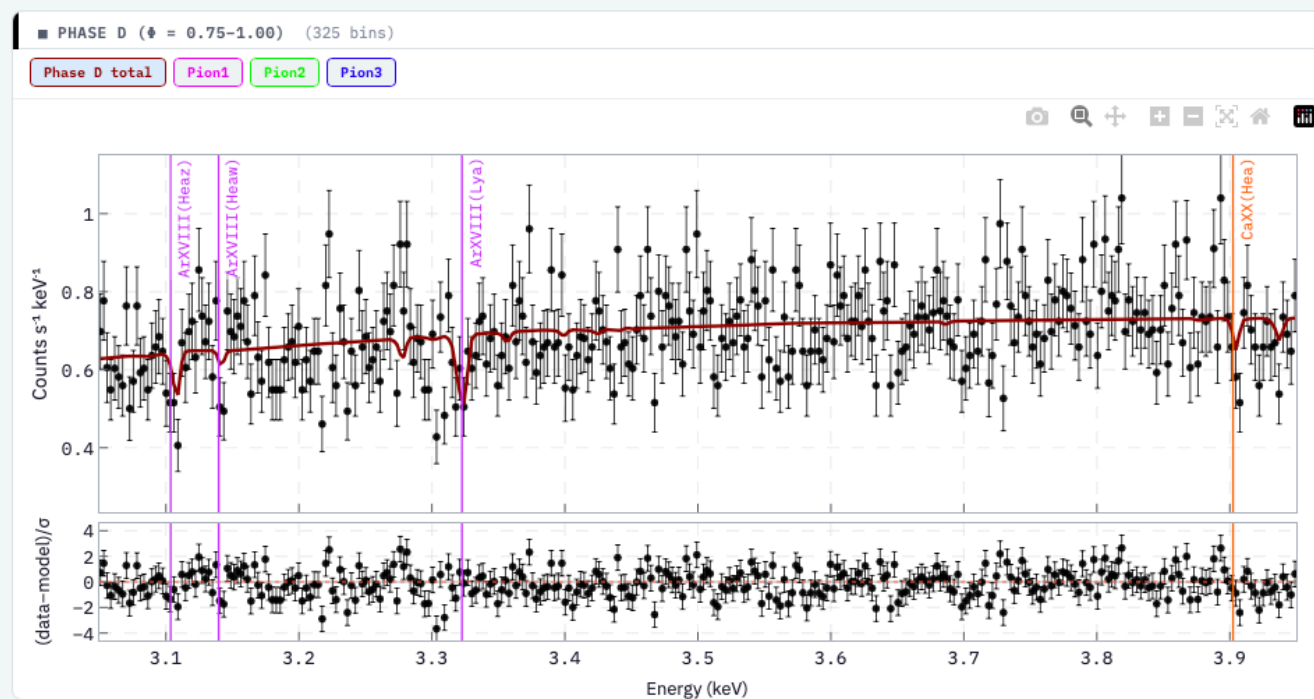
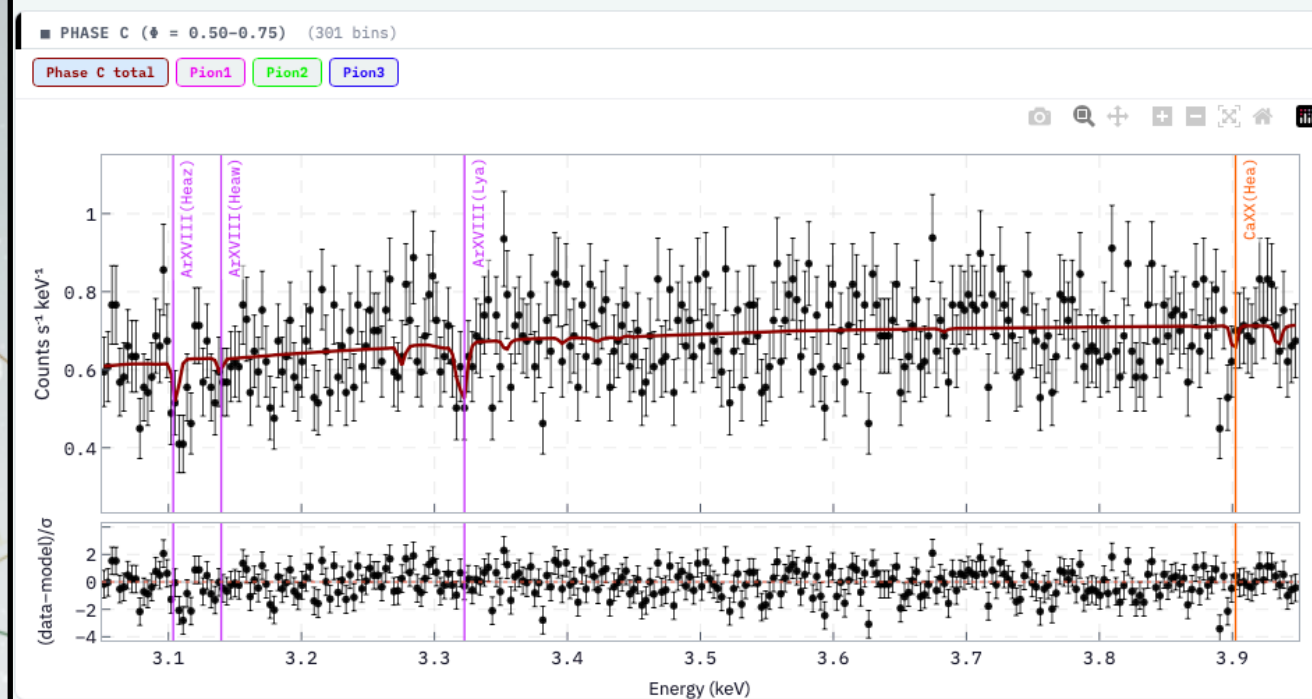
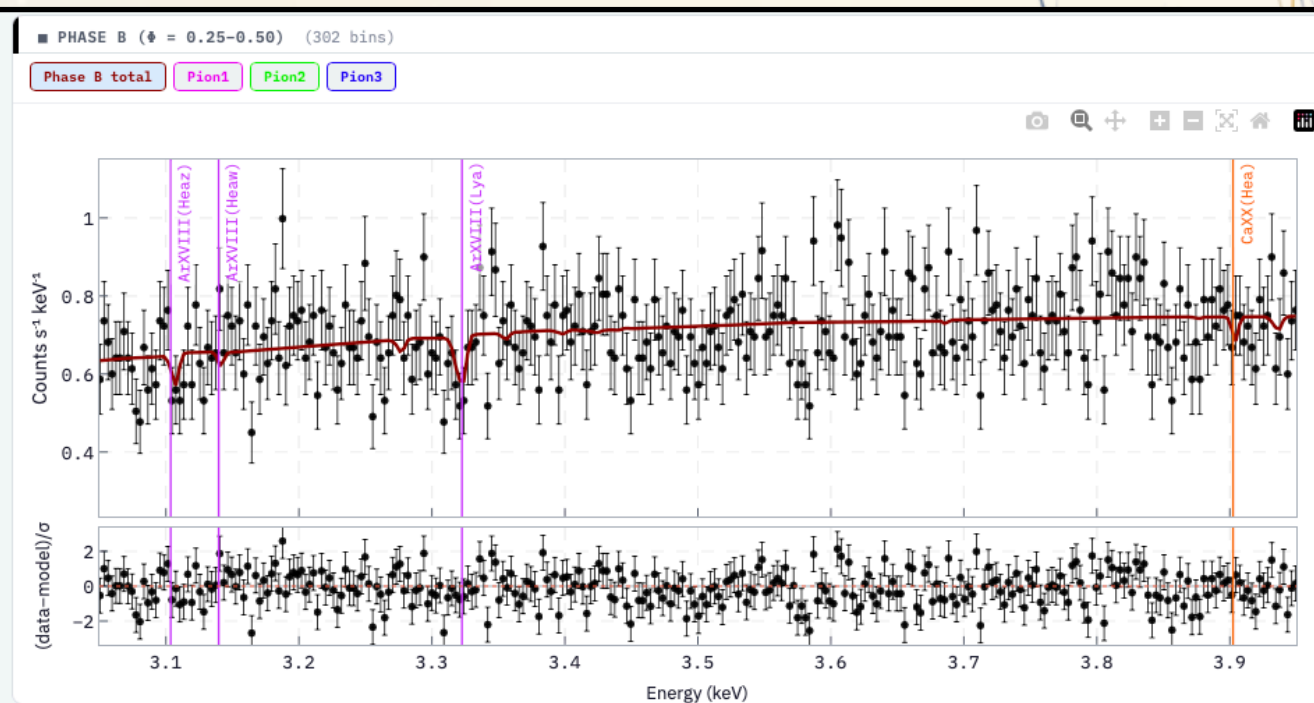
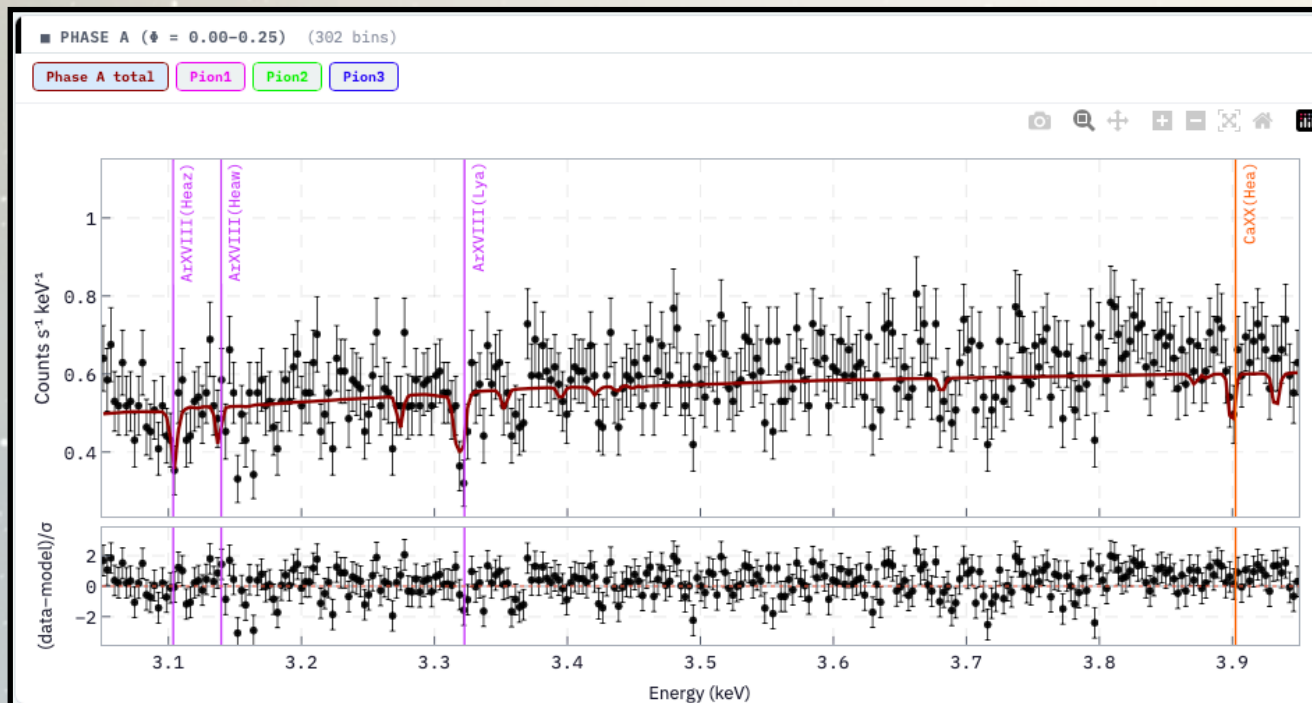


2.2-2.8 days

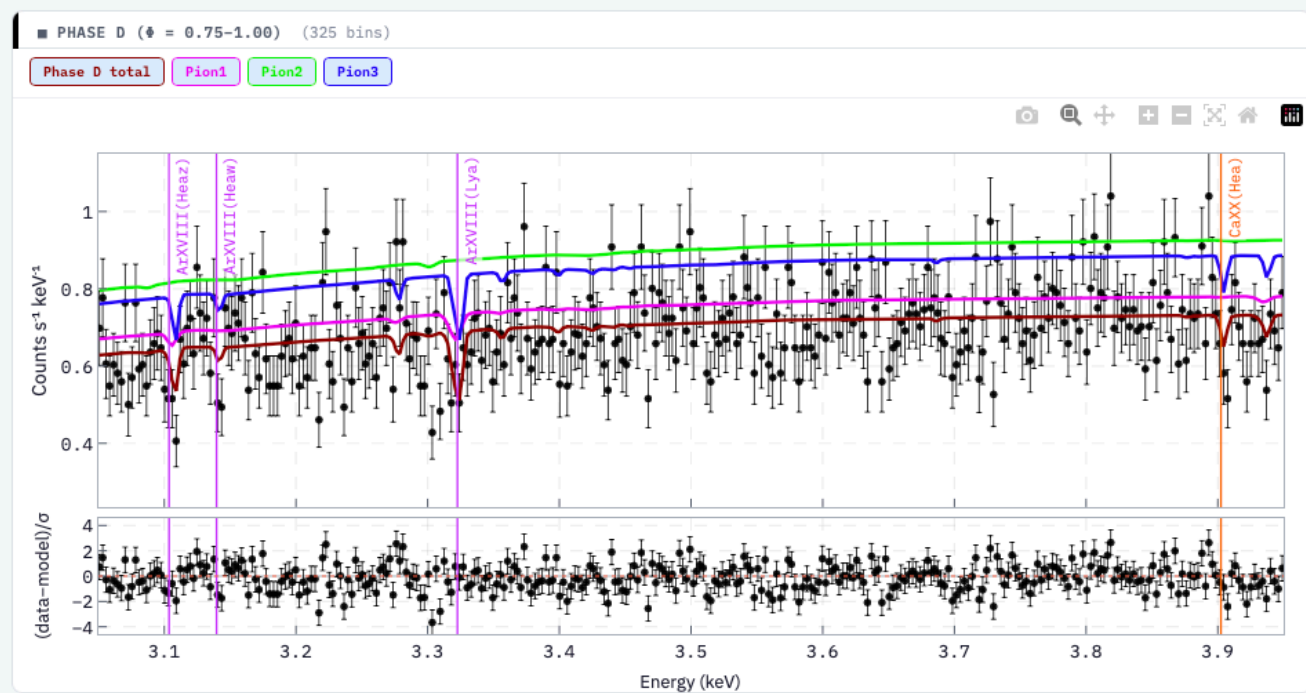
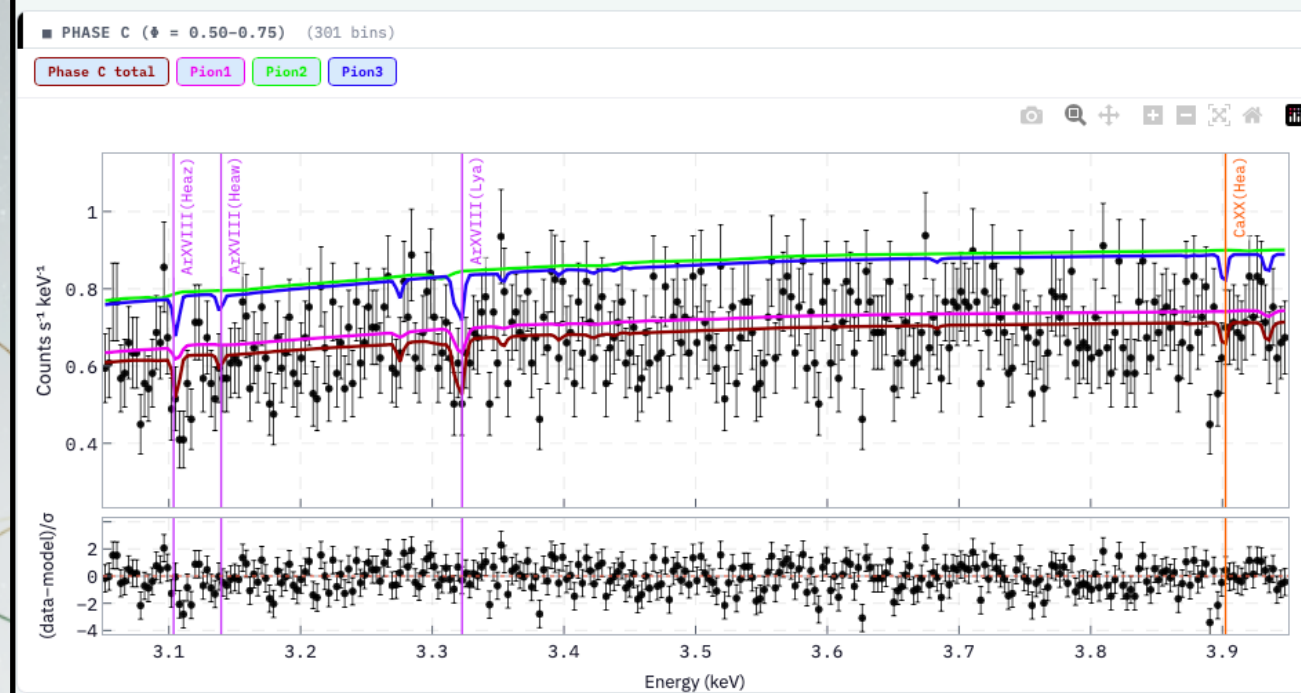
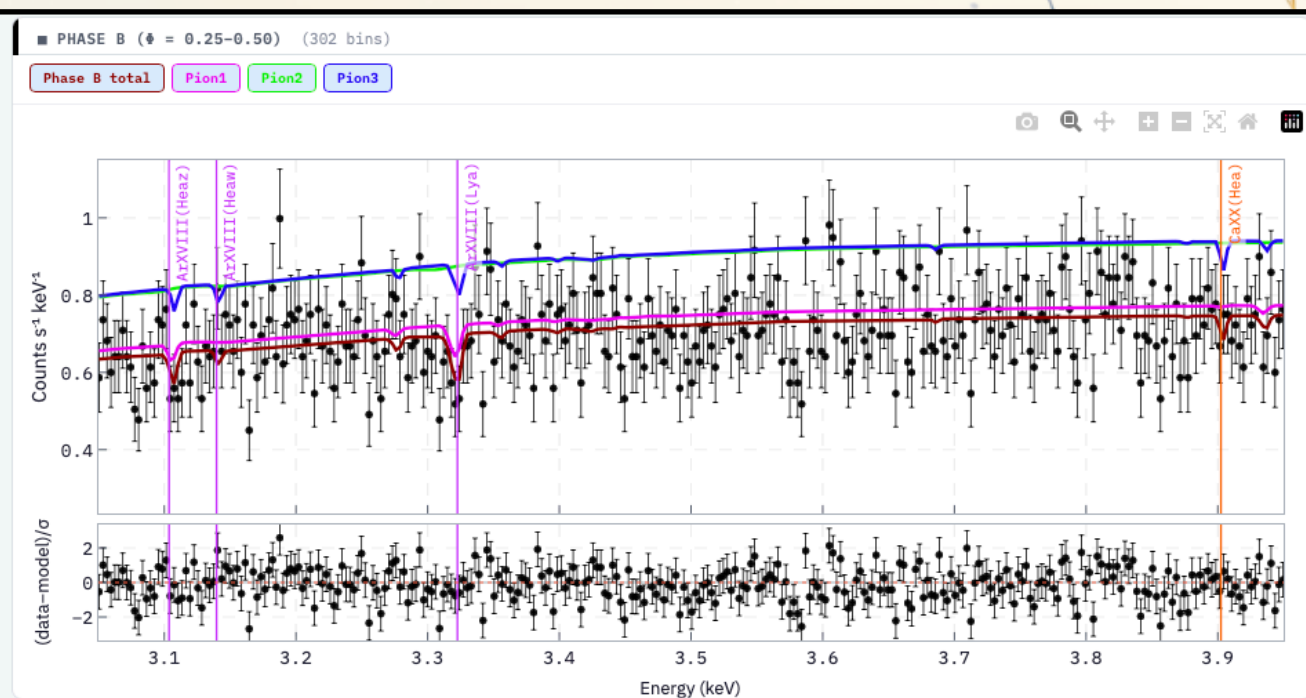
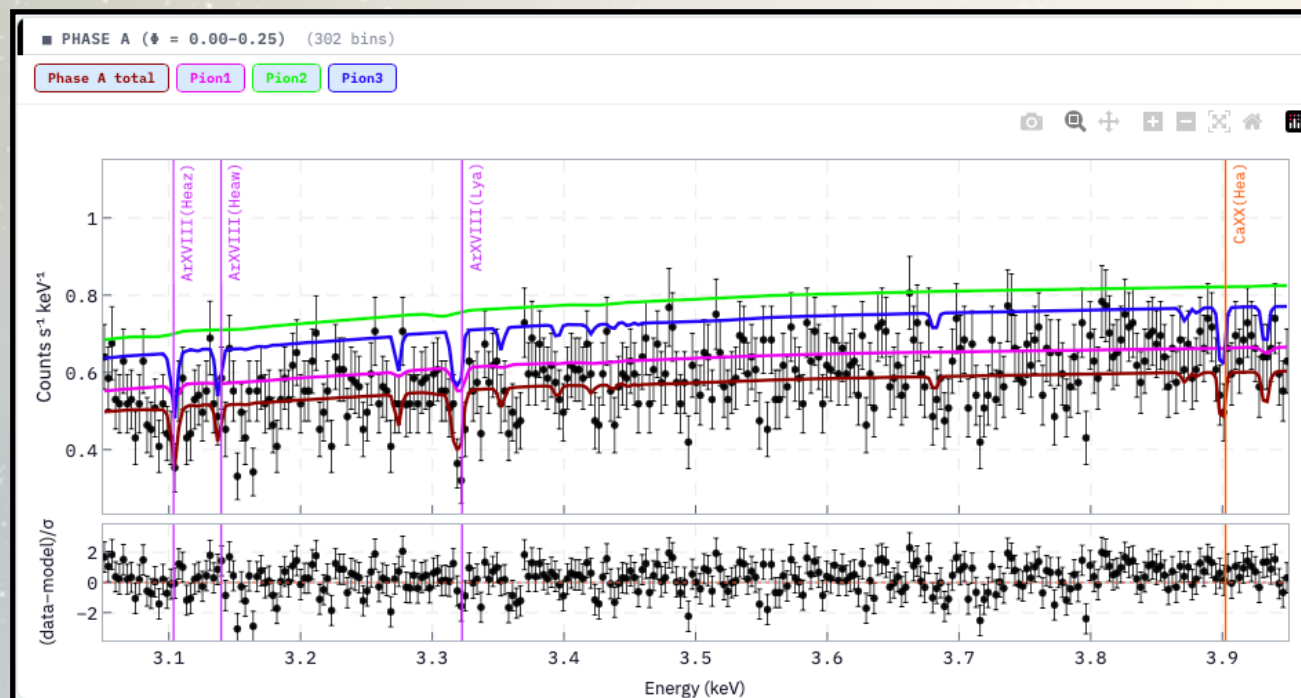
TIME SPECTRUM



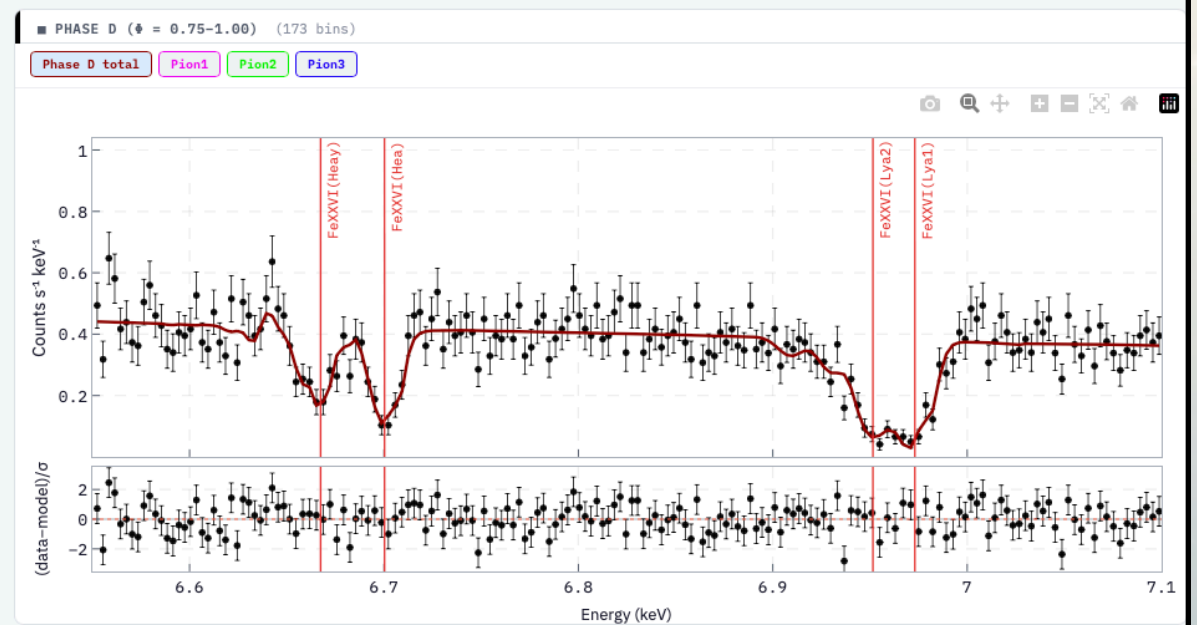
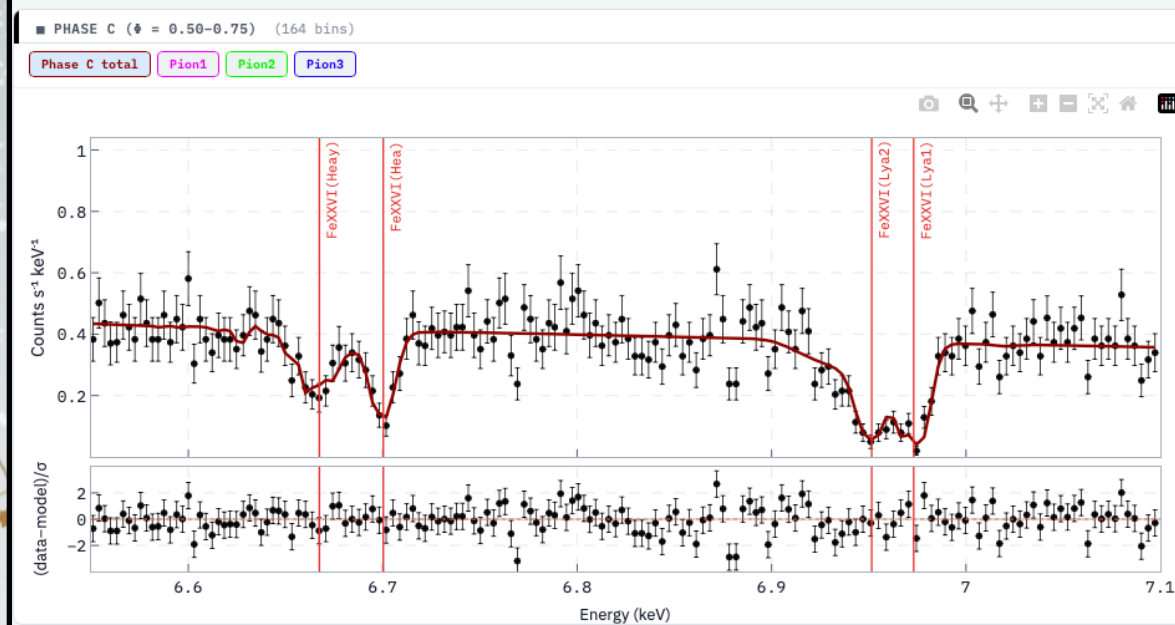
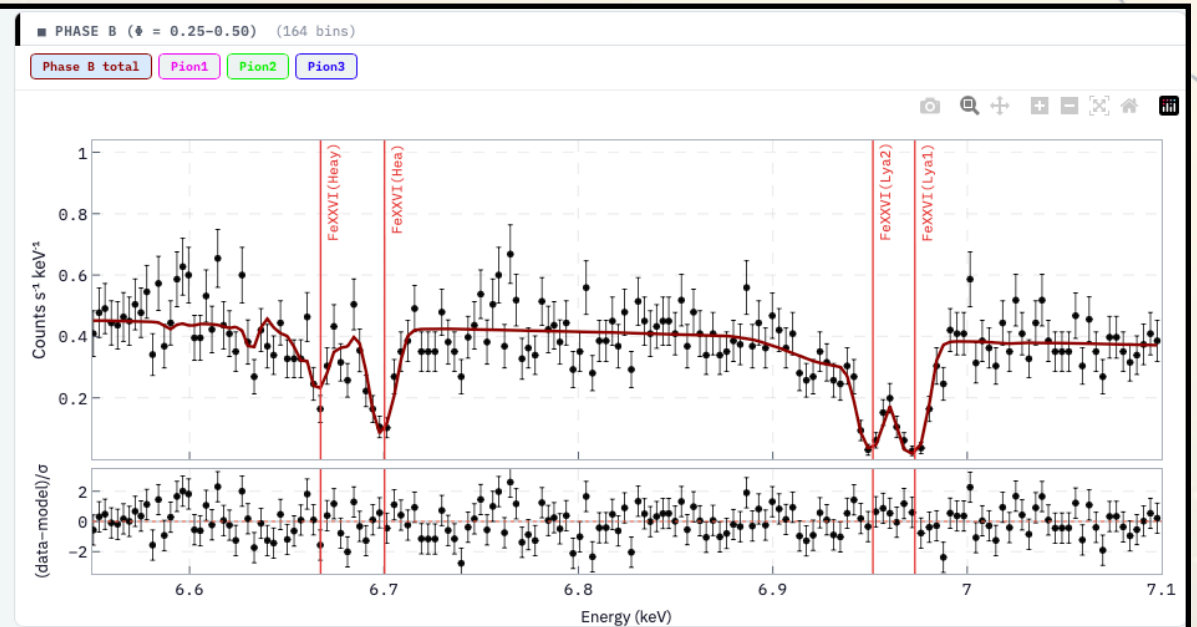
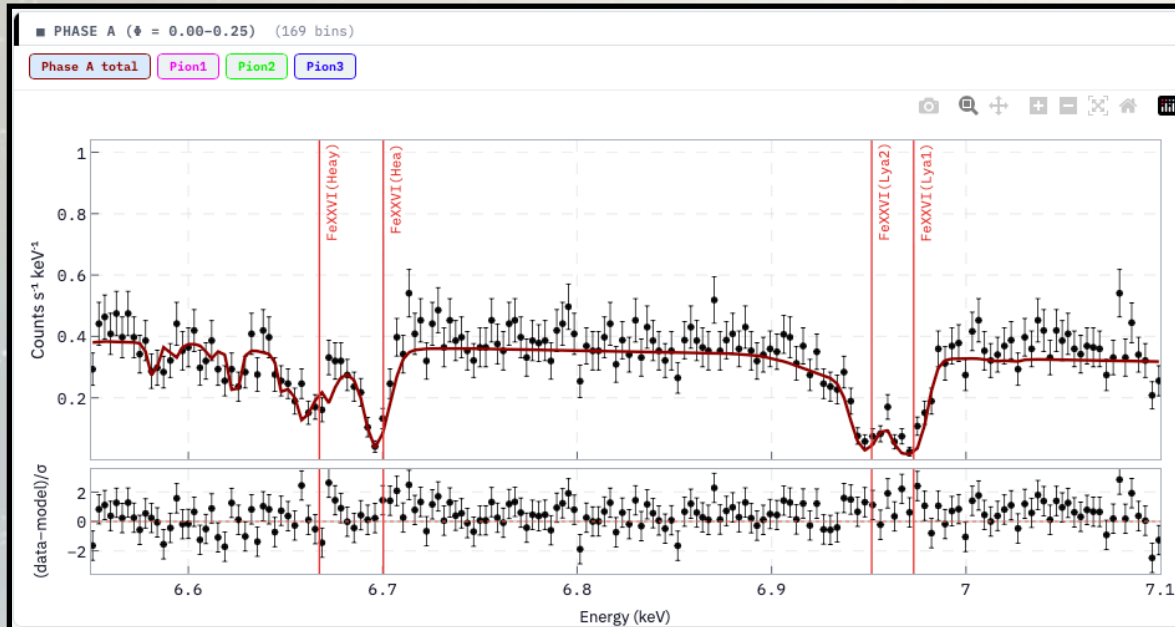
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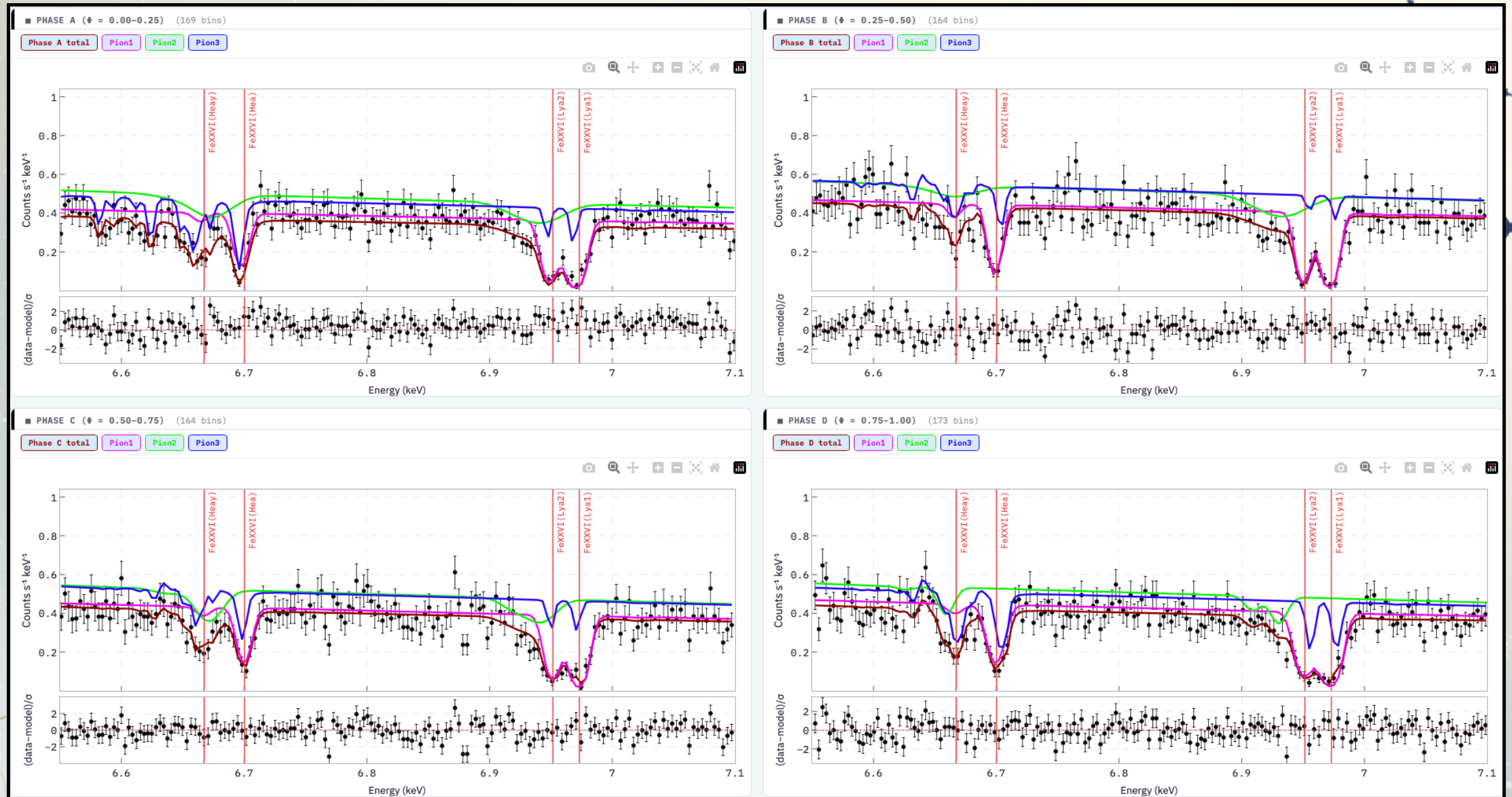
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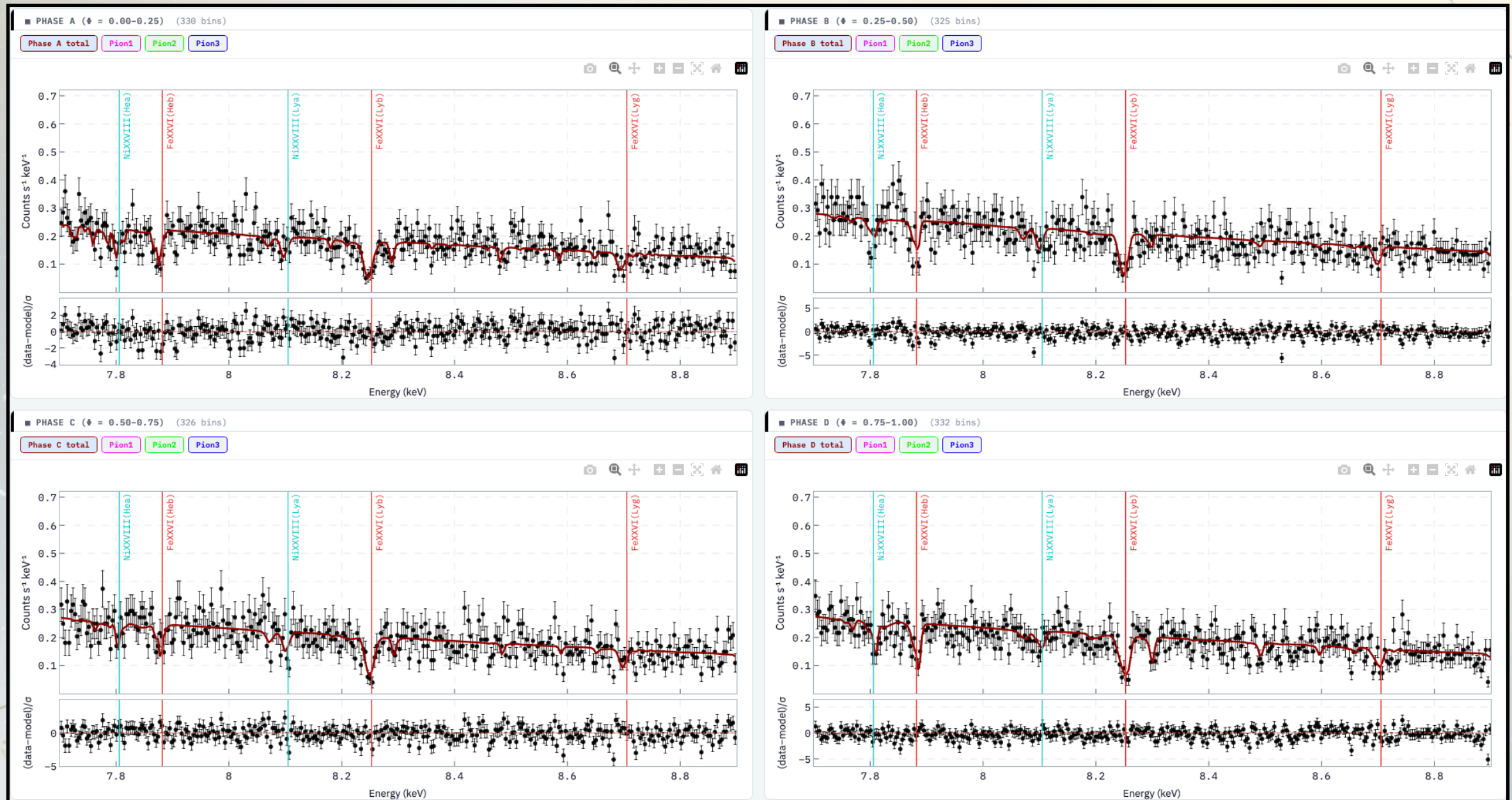
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PHASE SPECTRUM



PHASE SPECTRUM



PHASE SPECTRUM

