A Study on Jet Formation & Disk Connection via Multi-wavelength Observations

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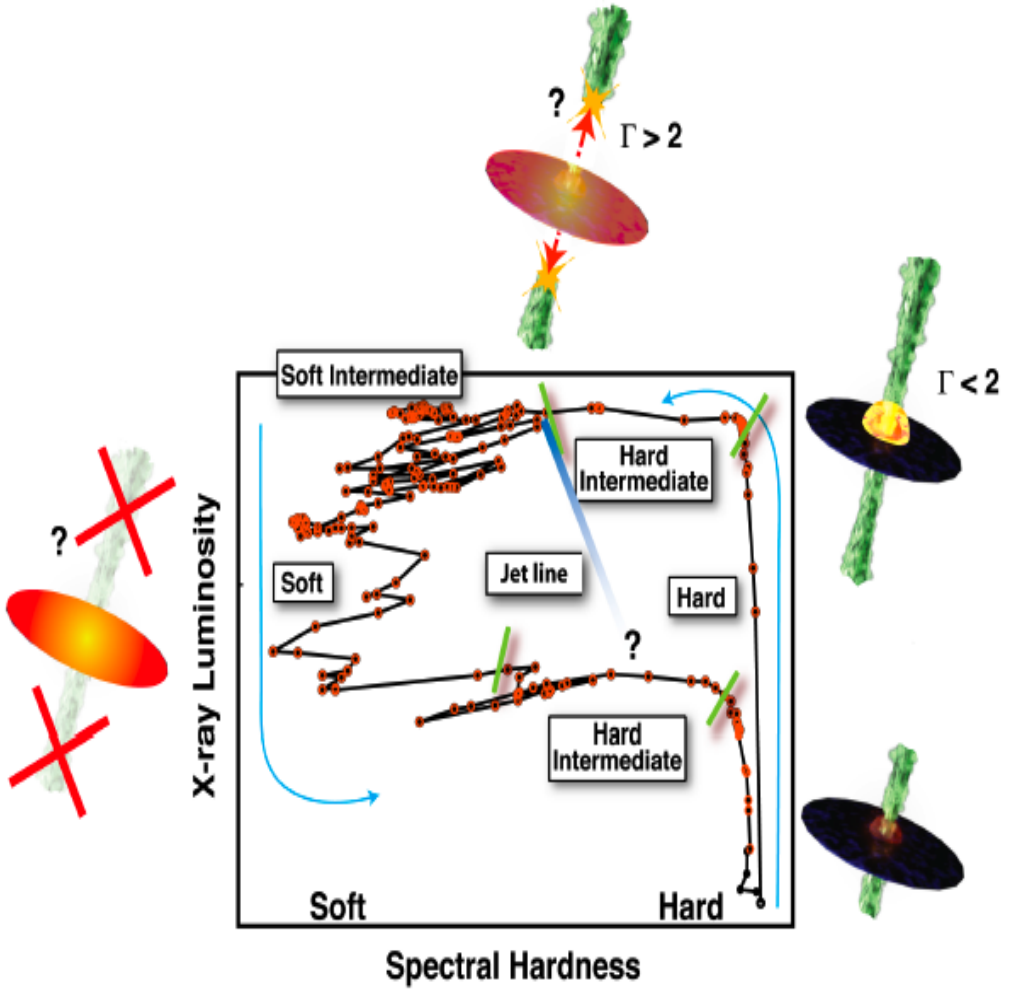
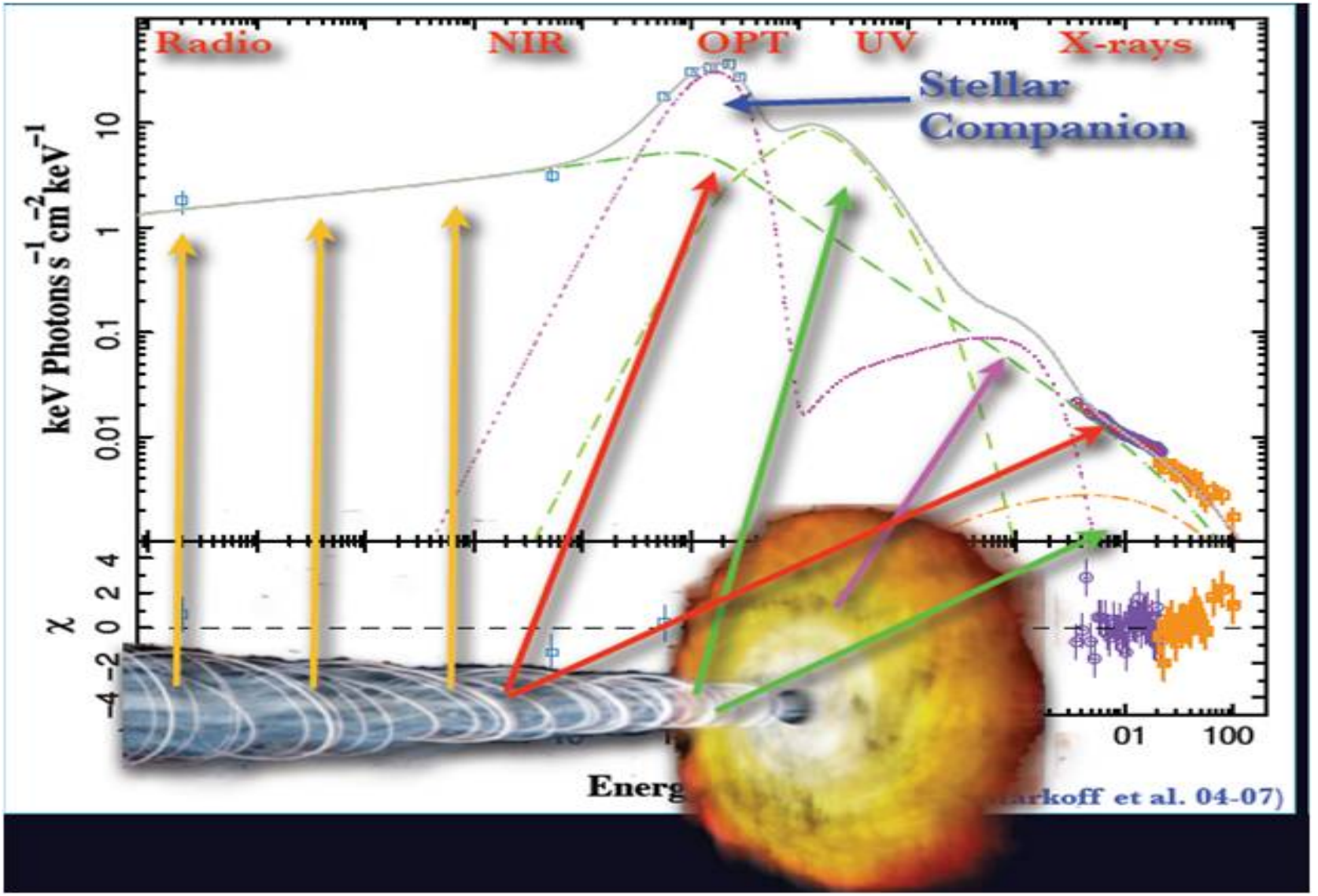
Black Hole Transients' Outburst Decay



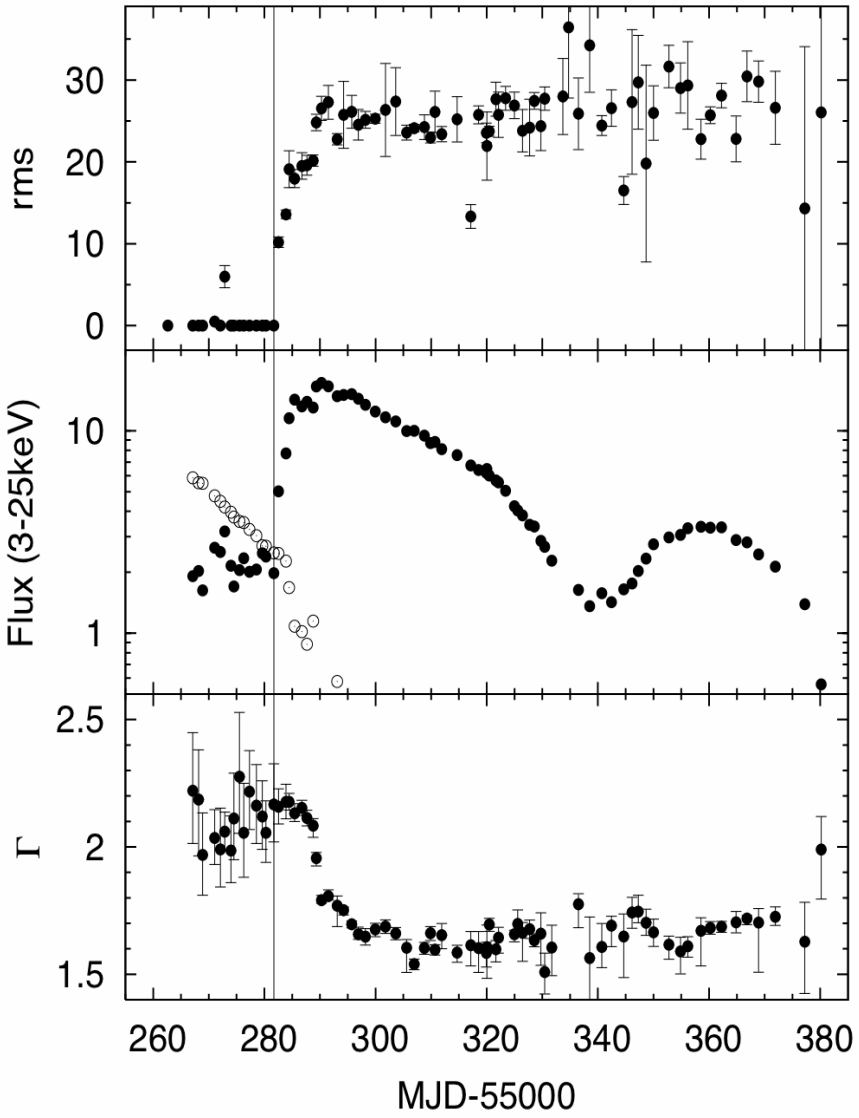
- studied on x-ray spectral analysis.
- Jet formation
- Jet/Disk connection

Multi-wavelength Observation



XTE J1752-223

- A newly observed X-ray transient (Oct. 2009) (Markwardt et al. 2009)
- was monitored by RXTE observations
- A transition in Apr. 2010 (MJD 55280-290)
- Currently in quiescent since Jul. 2010 (re-brightening? Corral-Santana et al. 2010)

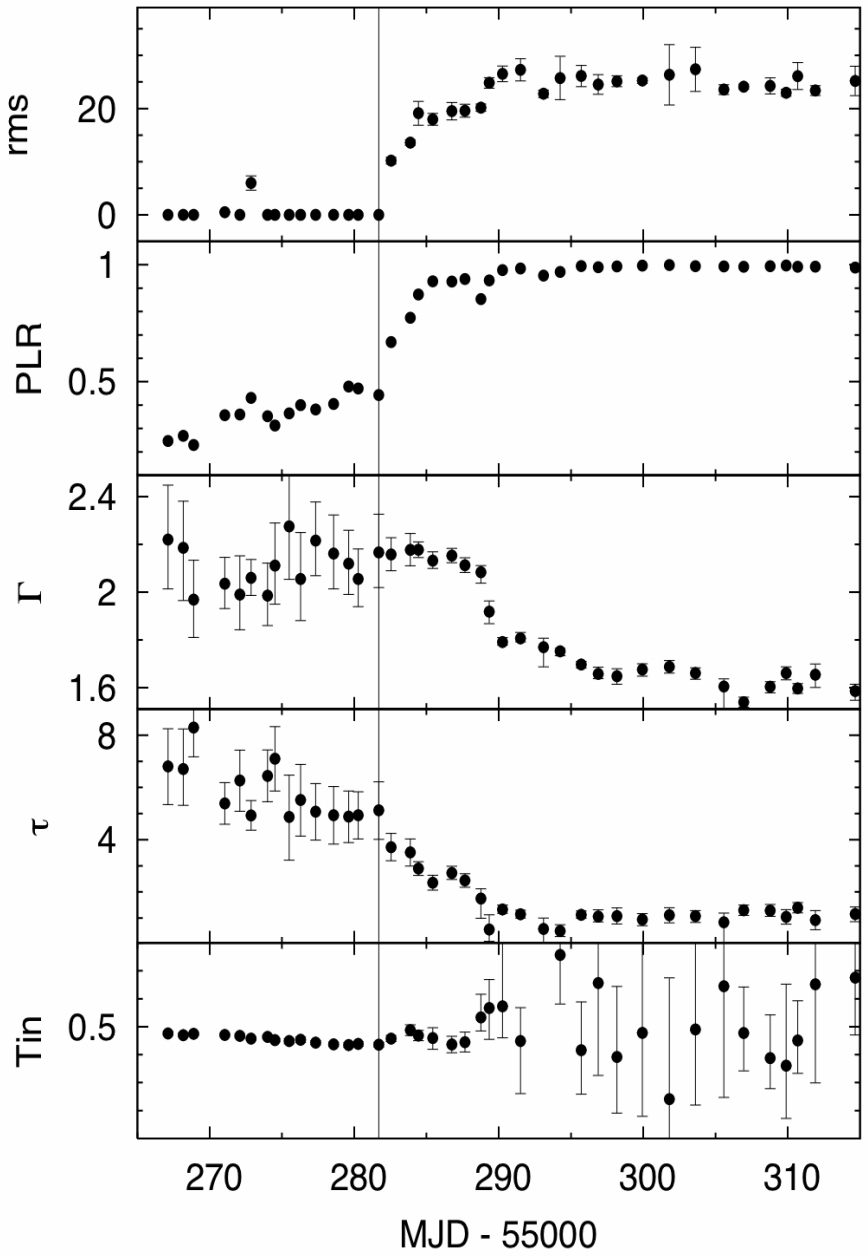


XTE J1752-223

- Model used =smedge*phabs*(diskBB+powerlaw)

  a gaussian required since MJD 55288.8 (ftest < 1%) when the peak happened

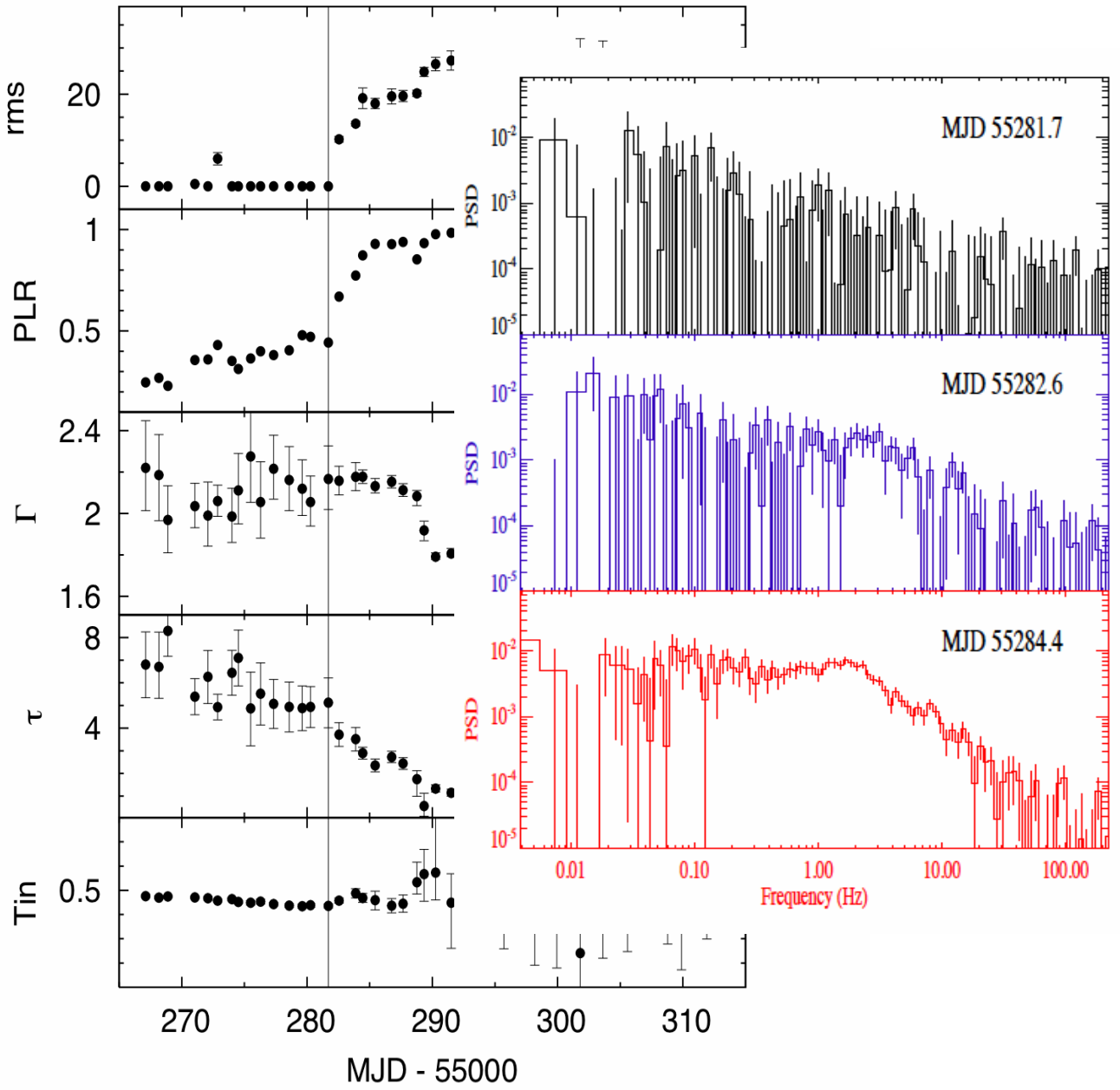
- remained the same until flux's peak, and decreased afterwards



XTE J1752-223

- rms shows the same as power law flux ratio to diskBB flux
- Constant inner disk temperature during this time ~0.5keV
- A gradual decrease in maximum absorption factor ( )

XTE J1752-223



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Integral observation

- MJD 55304.1 ~ 307.8 rev. 0917 & 0918 (168ks & 128ks)
- OSA software 9.0, IC 9.0 & cat. 31.0
- Analysis done for ISGRI and SPI, but SPI wasn't helpful.

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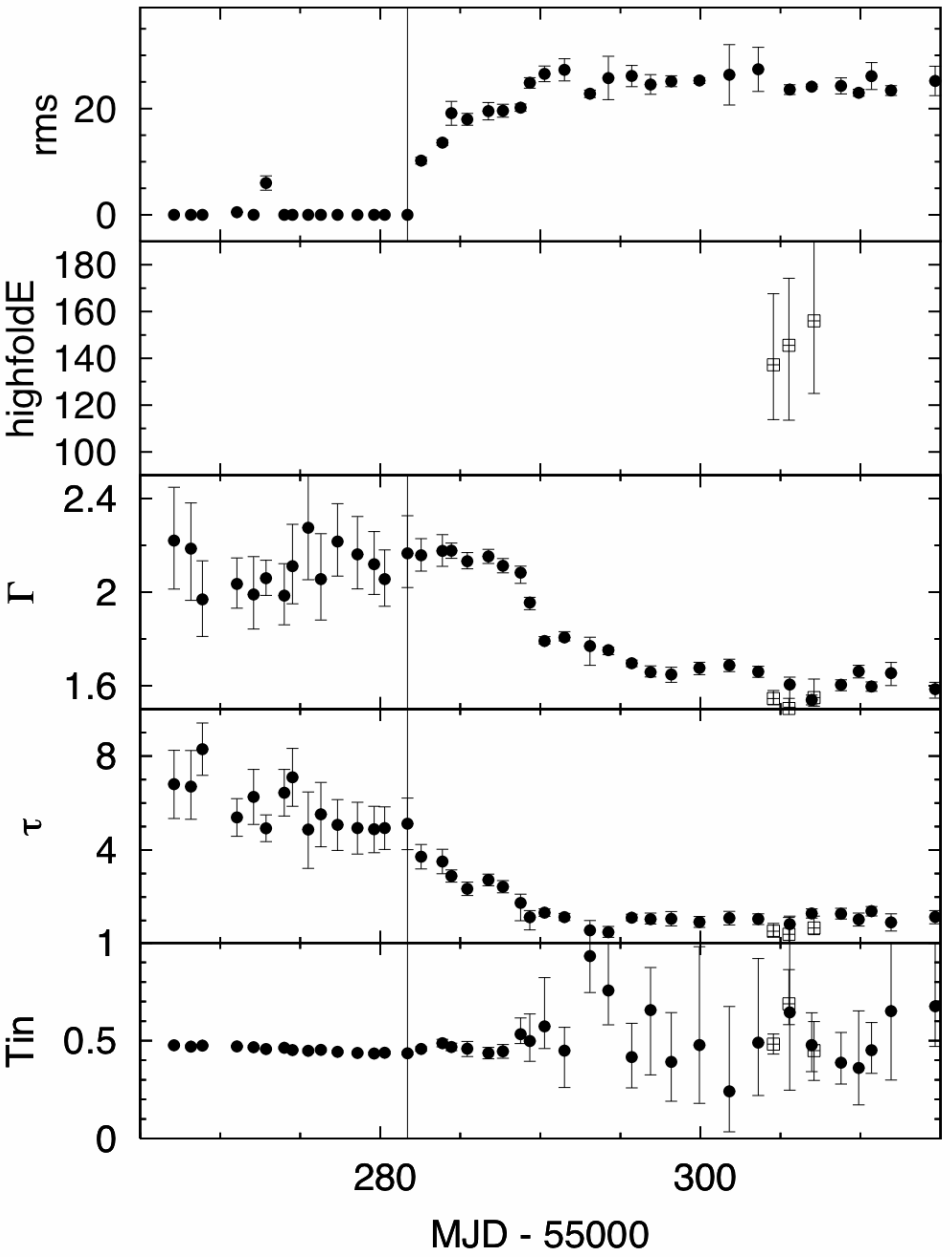


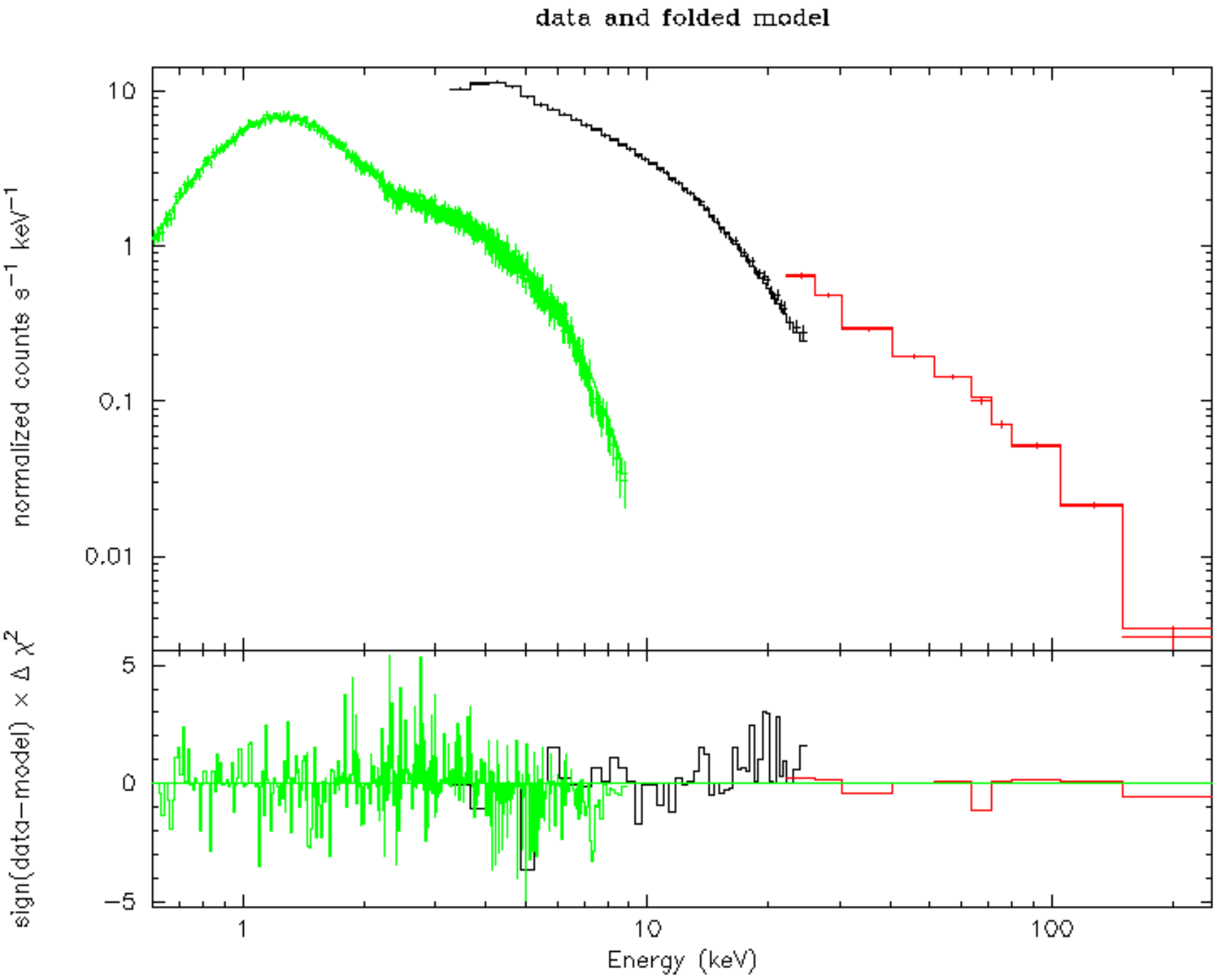
swift+XTE+Integral

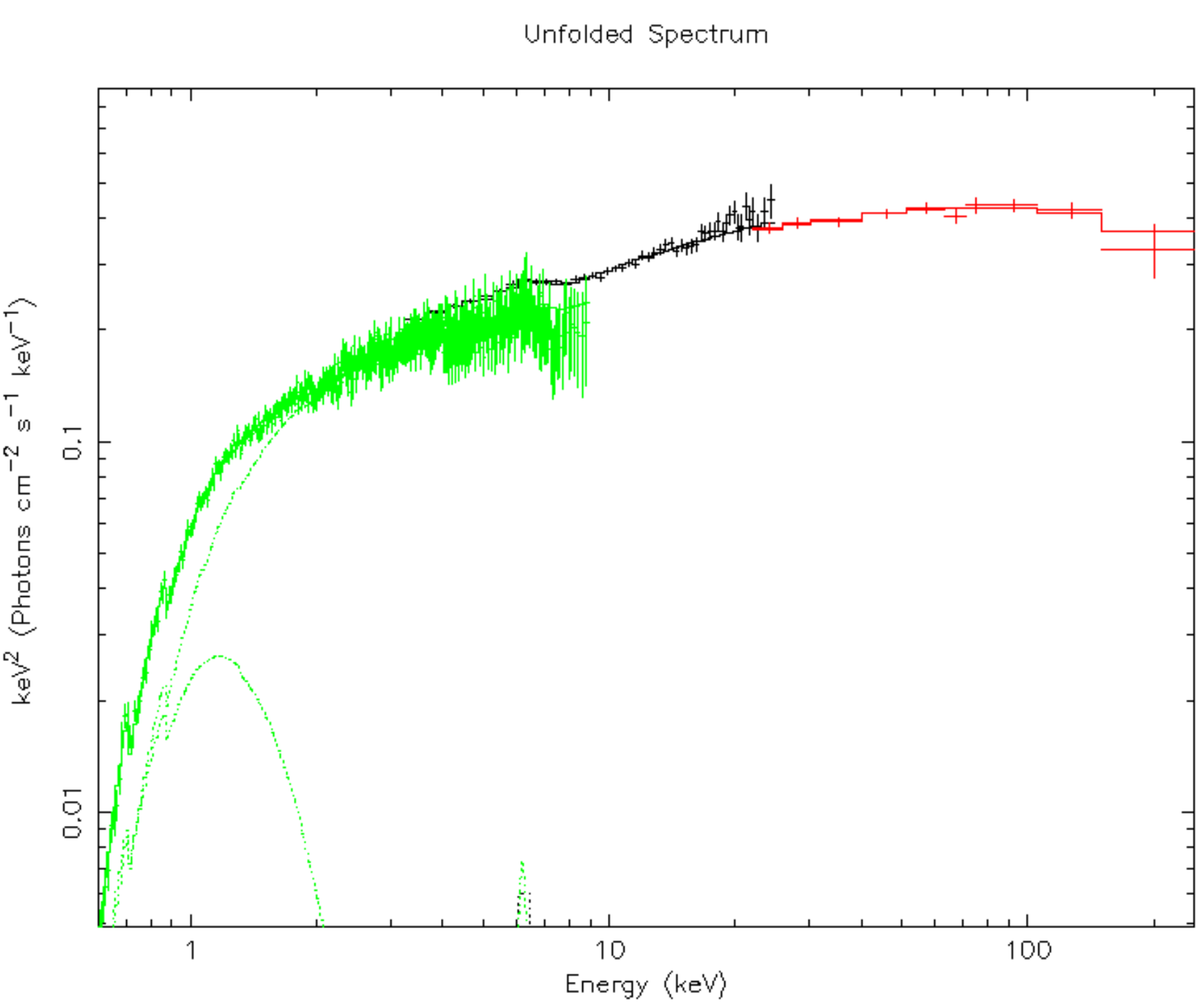
- 0.6~9.keV swift XRT (by J. Tomsick) combined for 3-d (13.5ks)
- 3.~25.keV XTE PCU2 P95702.01.01.01 (MJD55303.7, 1072s) & P95702.01.01.04 (MJD55306.9, 1456s), total 2528s
- 20.~200.keV Integral ISGRI also combined for 3 days.

Model fitted

- cont.*highecut*smedge*phabs*(diskBB+gaussian+powerlaw)
- 0.73 reduced chi-square
- Column density: 0.492e+22

  (consistent with Reis et al. 2010)
- : 1.71


data and folded model
normalized counts s^{-1} keV^{-1}
10
1
0.1
0.01
sign(data−model) × Δ χ^2
5
0
−5
1
10
100
Energy (keV)


Unfolded Spectrum
keV^2 (Photons cm^{-2} s^{-1} keV^{-1})
0.01
0.1
1
10
100
Energy (keV)

XTE J1752-223

- High energy cutoff necessary! (F-test < 1e-4)
- Folding energy: 274keV (cutoff: 25keV)

  Been reported by HEXTE observations, H1743-322, 4U 1543-47 etc.

  (Kalemci et al '05, '06, Rodriguez '03, Tomsick '01, etc. etc.)
- Relativistic Iron line ~ 6.3 keV needed for more accurate line profile (Reis et al '10)

To do

- More careful data analysis for XTE and swift, and data analysis for SMARTS optical/NIR.
- To consider other wavelength observation, e.g. VLA in radio, Faulkes in optical.
- And to check the contribution of energy bands via SED (spectral energy distribution) analysis.