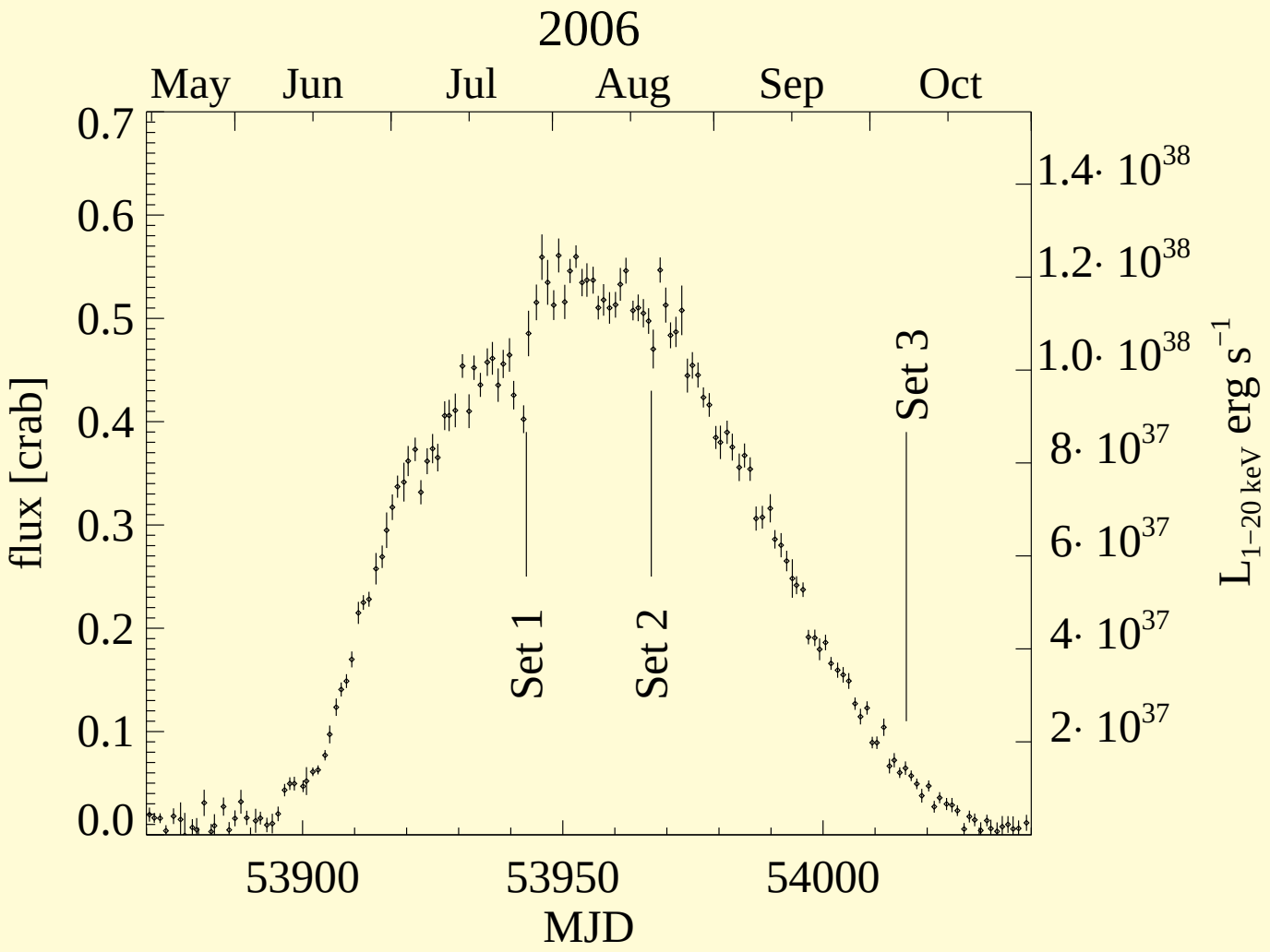
NS HMXB

INTEGRAL observations of the variability of OAO 1657-415 "Barnstedt, J. et al." "A&A 486, 293-302 (2008) "
Are There Magnetars in High Mass X-ray Binaries? The Case of SuperGiant Fast X-Ray Transients "Bozzo, E. et al." "The Astrophysical Journal (ApJ), 683: 1031-1044 (2008)"
INTEGRAL and Swift/XRT observations of the SFXT IGR J16479-4514: from quiescence to fast flaring activity "Sguera, V. et al." "A&A 487, 619-623 (2008)"
Discovery of a 30 day period in the supergiant fast X-ray transient SAX J1818.6-1703 "Bird, A.J. et al." Accepted for publication in MNRAS letters
The accretion powered spin-up of GRO J1750-27 "Shaw, S.E. et al." Accepted for publication in MNRAS.
INTEGRAL and XMM-Newton observations of AX J1845.0-0433 "Zurita Heras, J.A. and Walter, R." Accepted for publication in A&A
Peering through the stellar wind of IGR J19140+0951 with simultaneous INTEGRAL/RXTE observations "Prat, L. et al." "Monthly Notices of the Royal Astronomical Society, Volume 389, Issue 1, pp. 301-310 (2008)"
"INTEGRAL, XMM-Newton and ESO/NTT identification of AX J1749.1-2733: an obscured and likely-distant Be/X-ray binary" "Zurita Heras, J.A. and Chaty, S." "A&A 489, 657-667 (2008)"
INTEGRAL long-term monitoring of the Supergiant Fast X-ray Transient XTE J1739-302 "Blay, P. et al." "A&A 489, 669-676 (2008)"
Search for Redshifted 2.2 MeV Neutron Capture Line From A0535+262 in Outburst "Caliskan, Sirin et al." Accepted to the Astrophysical Journal
IGRJ16479-4514: the first eclipsing supergiant fast X-ray transient? "Bozzo, E. et al." "Monthly Notices of the Royal Astronomical Society: Letters, Volume 391, Issue 1, pp. L108-L112 (2008)"
Giant outburst of EXO 2030+375: pulse-phase resolved analysis of INTEGRAL data "Klochkov, D. et al" "Astronomy and Astrophysics, Volume 491, Issue 3, 2008, pp.833-840 (2008)"
Disentangling the system geometry of the Supergiant Fast X-ray Transient IGR J11215-5952 with Swift "Romano, P. et al." Accepted for publication by the Astrophysical Journal
IGR J18483-0311: a new intermediate supergiant fast X-ray transient "Rahoui, F. and Chaty, S." "Astronomy and Astrophysics, Volume 492, Issue 1, 2008, pp. 163-166 (2008)"
Gamma-rays from the vicinity of accreting neutron stars inside compact high-mass X-ray binaries "Bednarek, W." Submitted to A&A
High variability in Vela X-1: giant flares and off states "Kreykenbohm, I. et al." "Astronomy and Astrophysics, Volume 492, Issue 2, 2008, pp.511-525 (2008)"
Discovery of an eccentric 30 days period in the supergiant X-ray binary SAX J1818.6-1703 with INTEGRAL "Zurita Heras, J.A. and Chaty, S." "Astronomy and Astrophysics, Volume 493, Issue 1, 2009, pp.L1-L4"

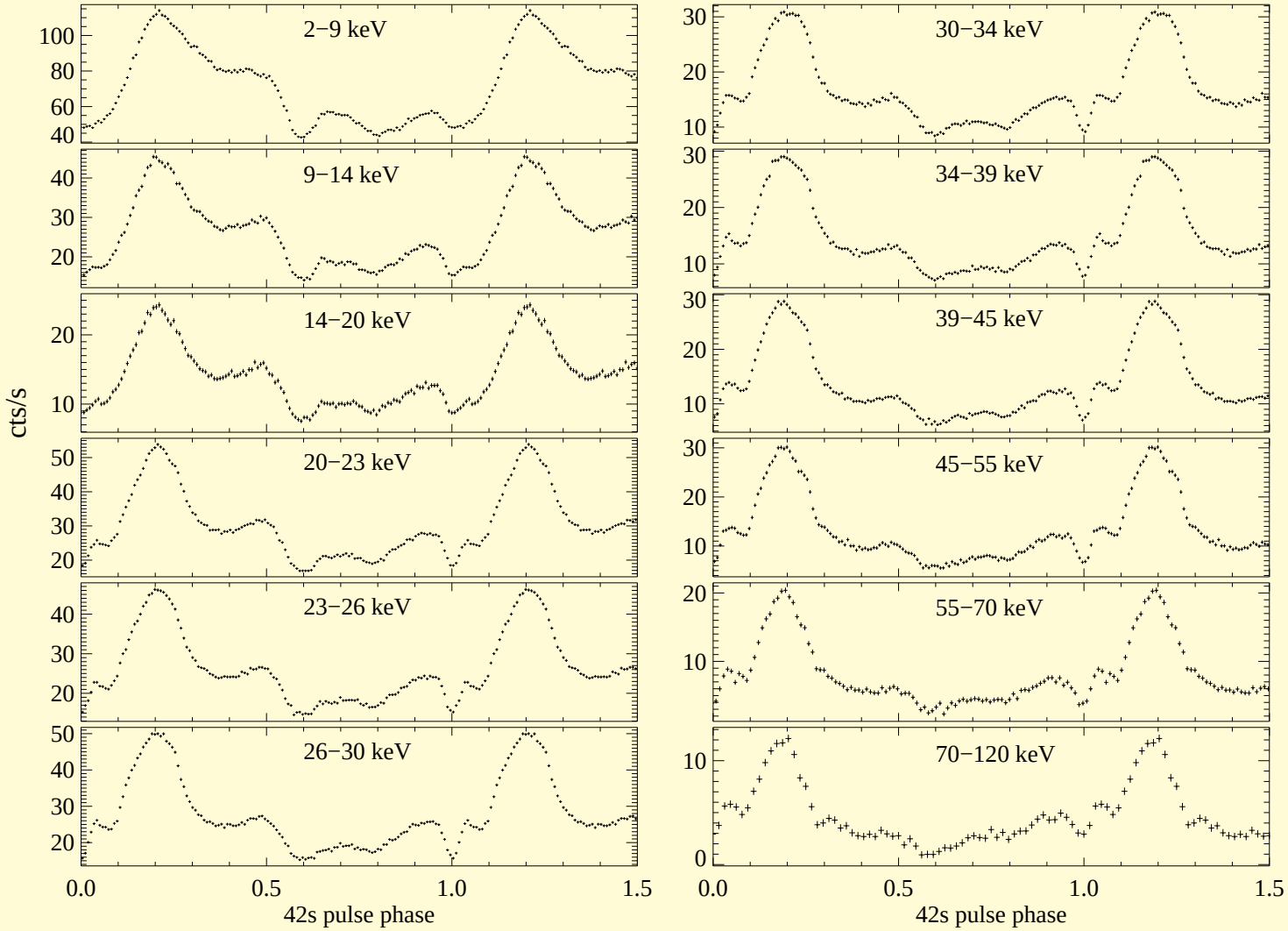
2006 Outburst



EXO 2030+375: Be XRB, Jun-Sep 2006: 2nd giant outburst since its discovery (*EXOSAT* in 1985, Parmar et al., 1989). 46 d orbit, $e \sim 0.42$

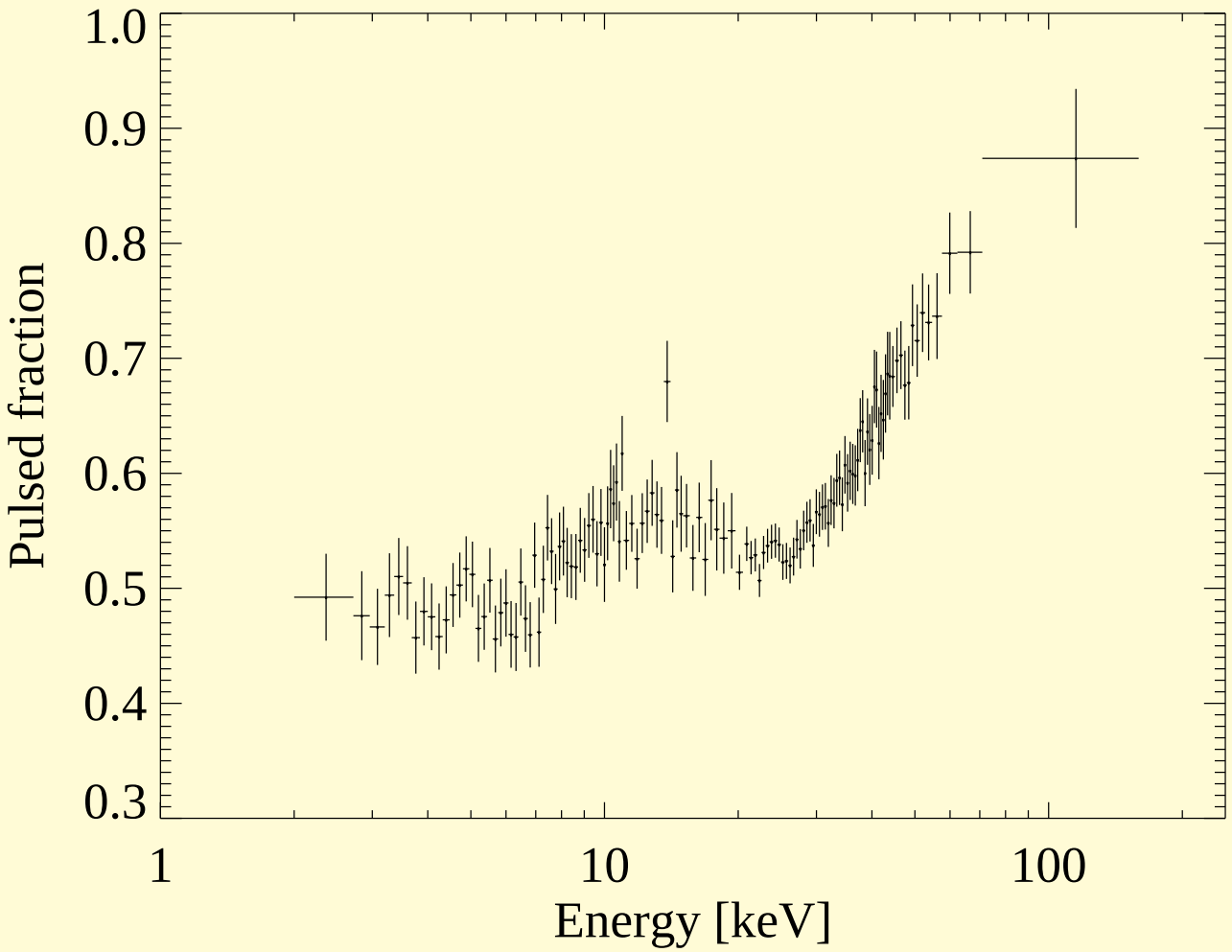
INTEGRAL: Klochkov et al., 2008, A&A 491, 833, concentrating on phase resolved analysis during maximum and decay

2006 Outburst



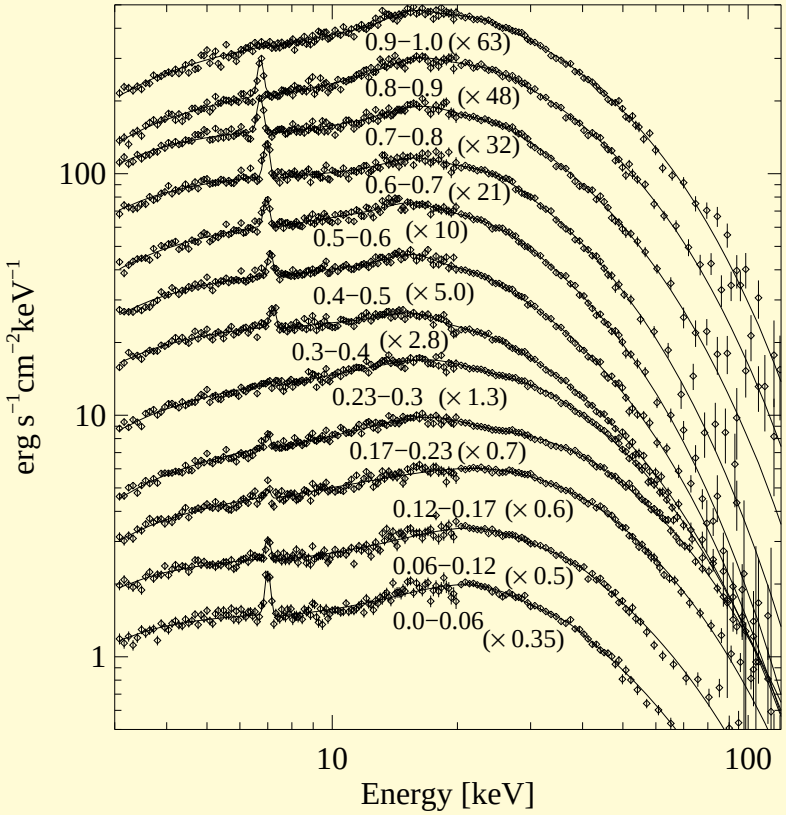
Pulse shape is energy dependent

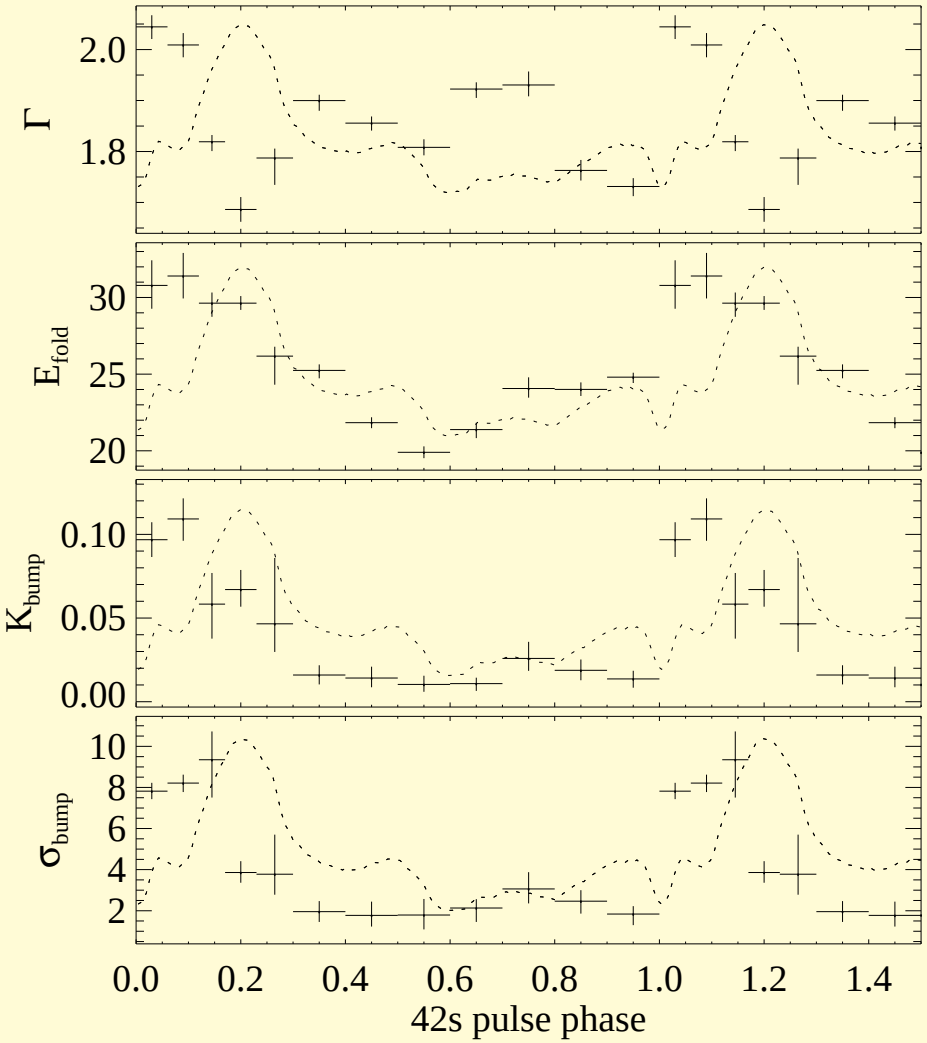
2006 Outburst



Pulsed fraction increases as function of E. Note $\sim$10 kev “bump”

2006 Outburst





Strong spectral variability over pulse, 10 keV “bump” depends on pulse

SFXTs

Second HMXB subject area triggered by *INTEGRAL*: nature of Supergiant Fast X-ray Transients.

Other SFXT science:

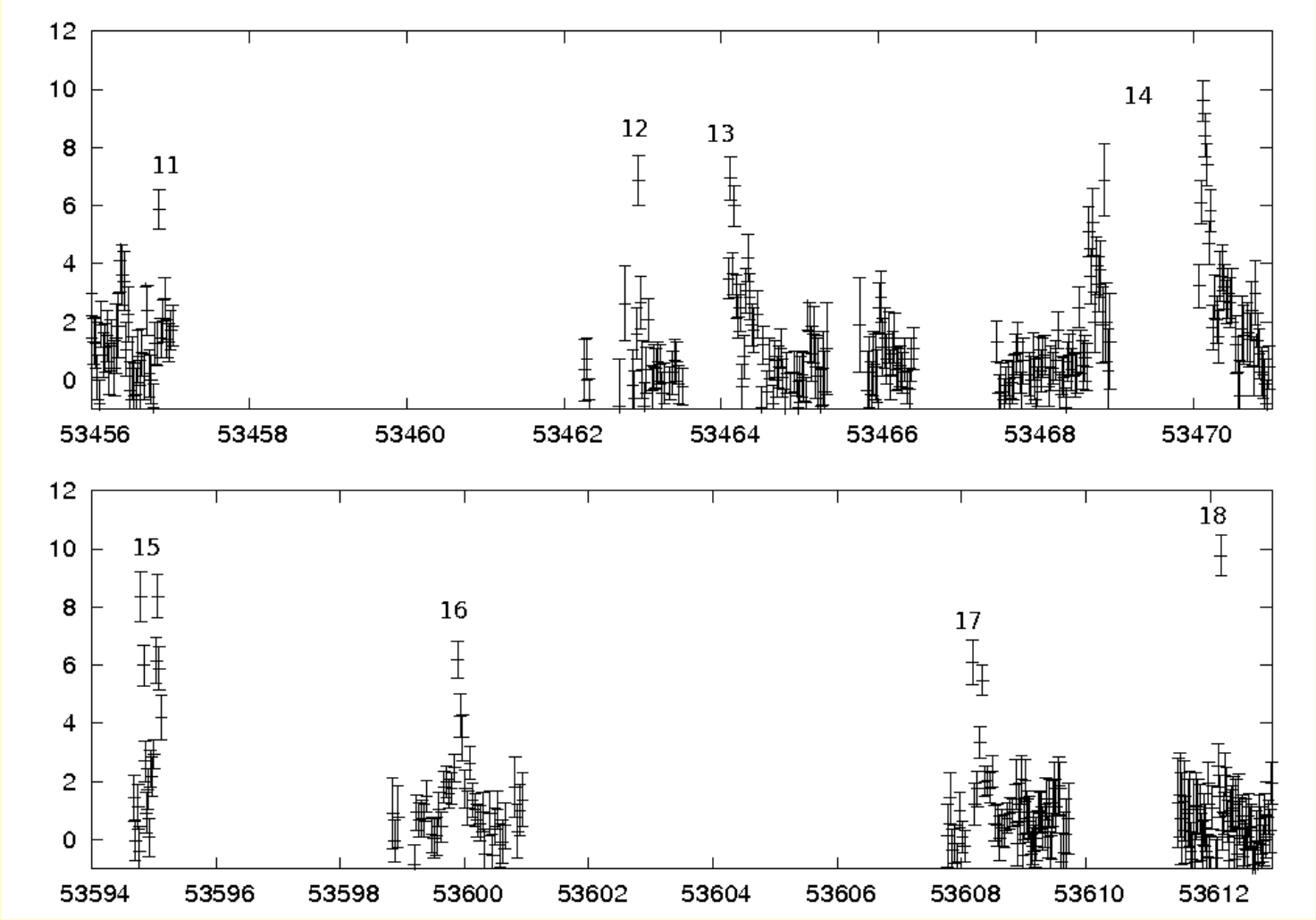
- 30 d period in IGR J1717.6−1703
  (2 papers: Bird et al. and Zurita Heras et al.)
- analysis of wind profile in IGR J19140+0951 (Prat et al.)
- possible eclipses in IGR J16479−4514 (Bozzo et al.)
- geometry of system, wind profile in IGR J11215-5952 (Romano et al.)

Flares:

- Sguera et al., 2008, A&A 487, 619
- Kreykenbohm et al., 2008, A&A 492, 511

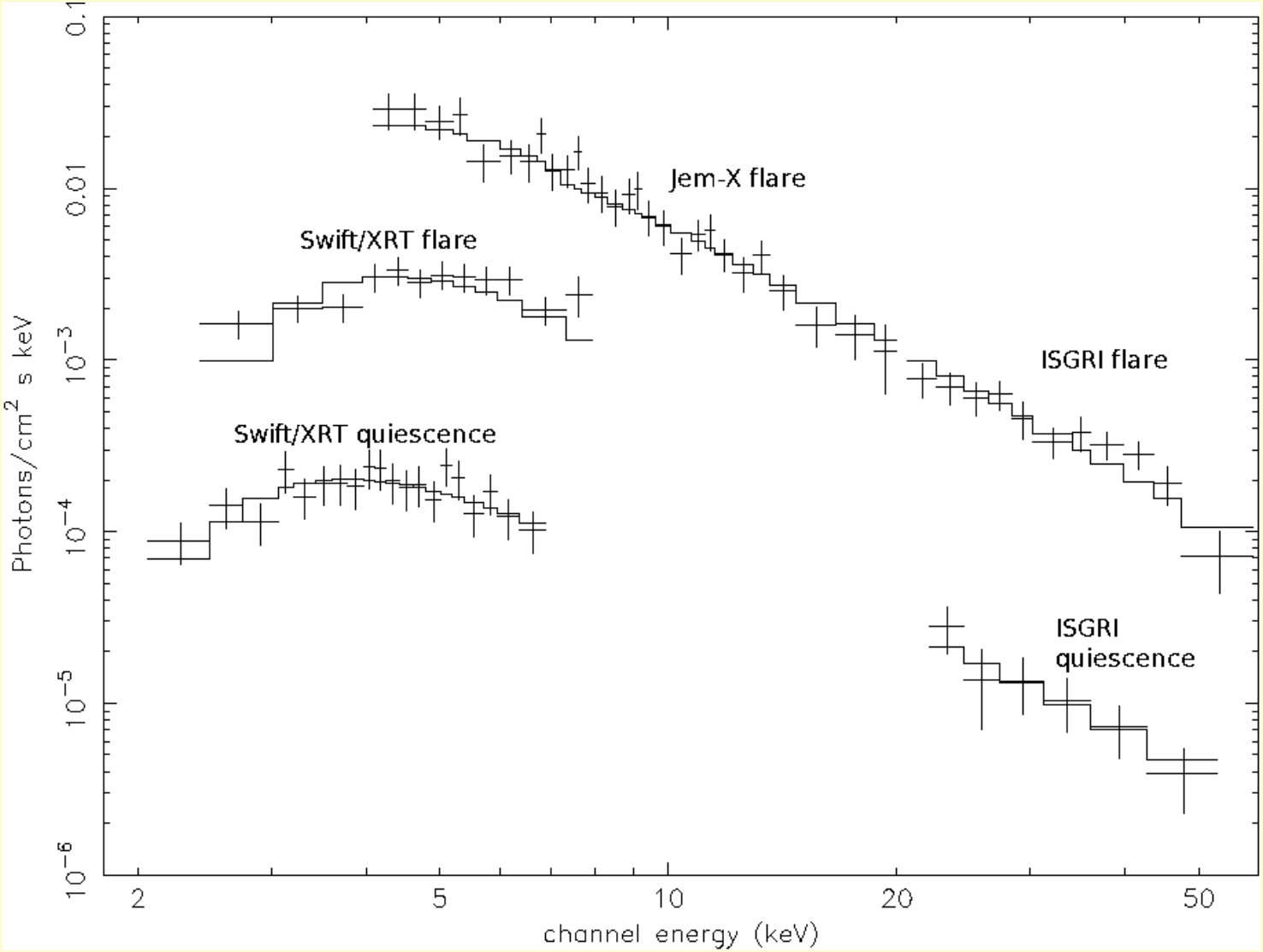
For time reasons, I will concentrate on flares

IGR J16479−4514

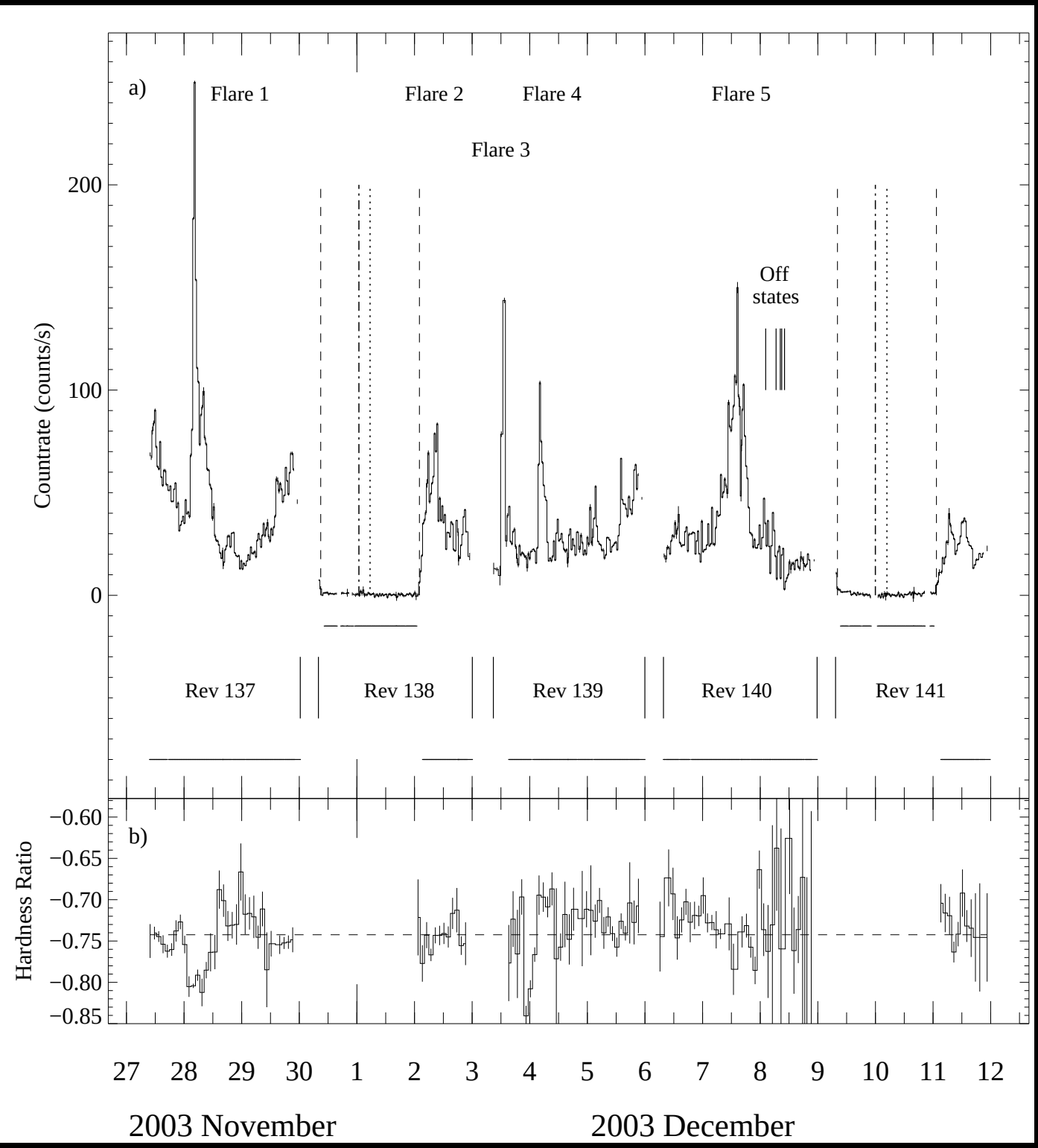


Sguera et al.: discuss observations of IGR J16479−4514 from quiescence to fast flaring activity with *INTEGRAL* and *Swift*. Typically one flare every 1–2 days (highest duty cycle of all SFXTs).

IGR J16479−4514



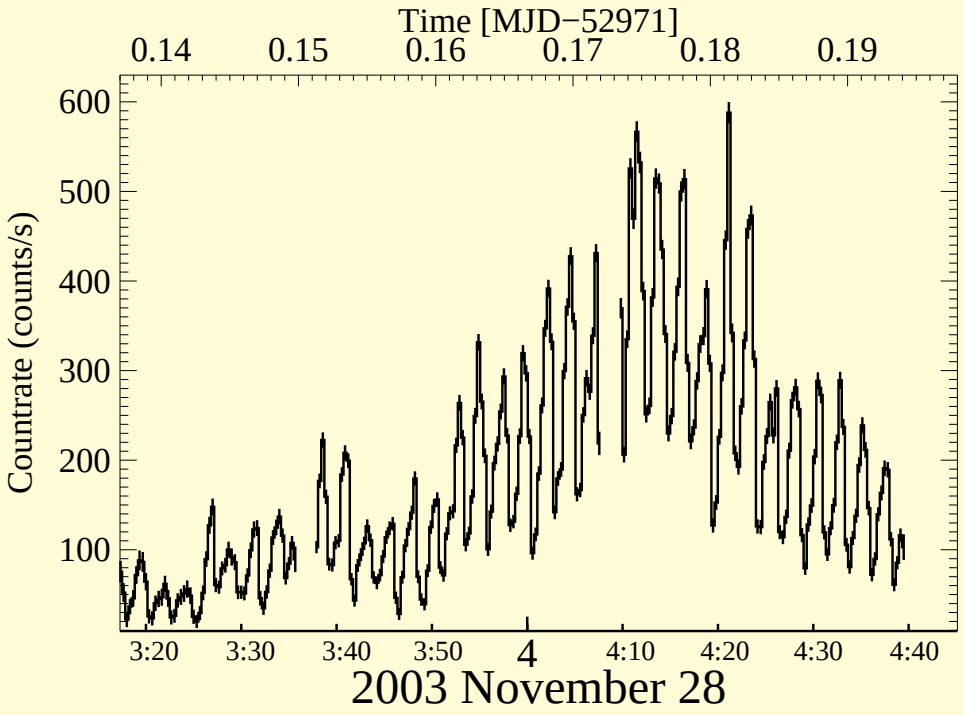
Flare and quiescent spectrum, in quiescence, system $\sim$100$\times$ brighter than usual SFXTs (persistent vs. clump accretion?)



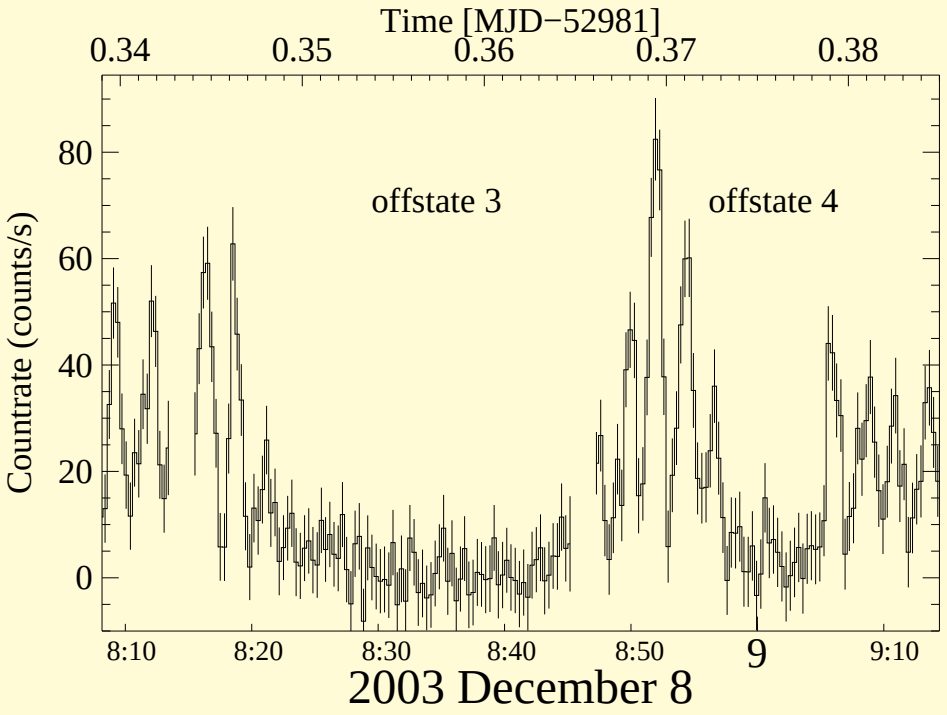
Wind accreting HMXB Vela X-1 also shows flares, but they are more rare than in SFXTs.

Does Vela X-1 repre-sent transition between “normal” wind accreting systems and SFXTs?

Vela X-1



Giant flare

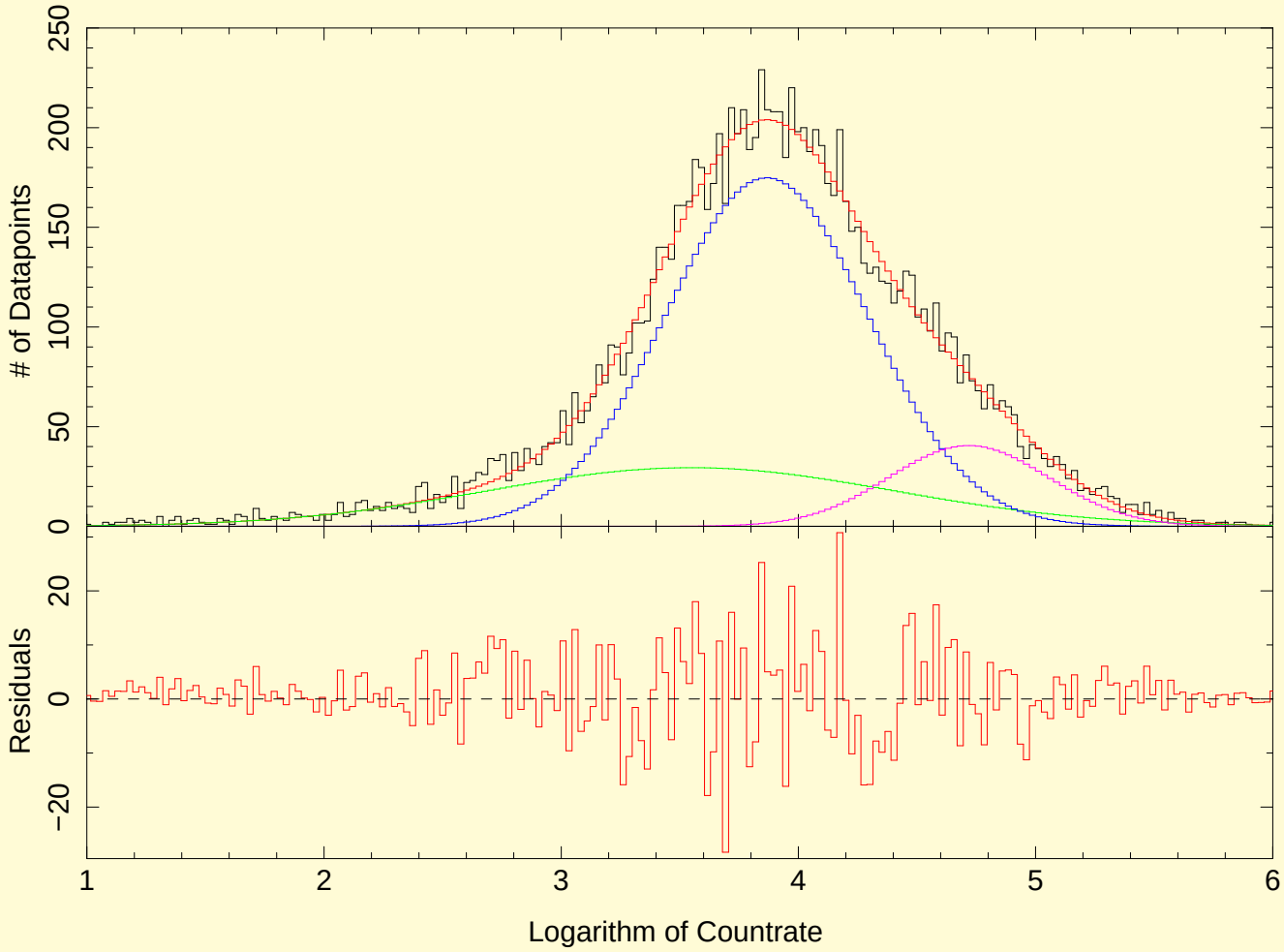


Off state

In addition, also “off states” $\Longrightarrow$ accretion switched off

Possible explanation: clumpy winds $\Longrightarrow$ strong density variations $\Longrightarrow$ allows source to go into propellor regime

Vela X-1



Statistics of pulse integrated fluxes in all *INTEGRAL* observations of Vela X-1

$\Longrightarrow$ almost lognormal distribution, agrees with predictions from clumpy stellar wind models

We're currently working on augmenting these statistics using *Swift*-BAT