

Three black-hole binaries observed with XMM-Newton: XTE J1817-330, XTE J1856+053 and GRS 1915+105

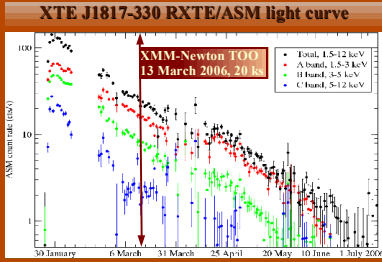


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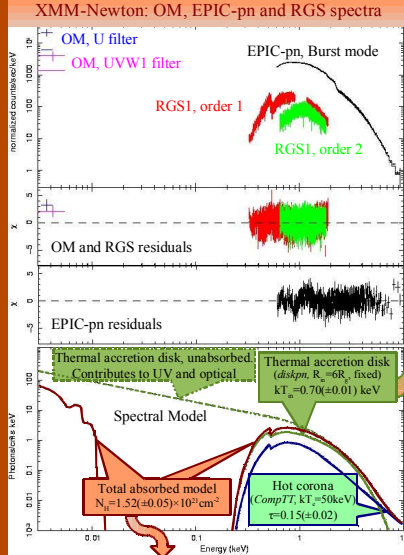
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XTE J1817-330



The black-hole candidate XTE J1817-330, discovered on 26 January 2006 with RXTE (Remillard et al. Atel#714), was observed by XMM-Newton on 2006 March 13.



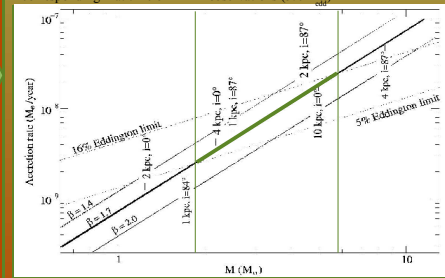
The observed column density is compatible with the average galactic column density in the source direction (Dickey & Lockmann 1990, ARAA, 28, 215) \Rightarrow the source is behind the Galactic slab \Rightarrow minimum distance is 1 kpc

Unabs. $L_{(0.4-10\text{keV})} @ 1\text{kpc} = 1.2(\pm 0.1) \times 10^{36} (D/1\text{kpc})^2 \text{ erg s}^{-1}$

Black-hole mass
The low temperature of the accretion disk points to a black hole as accreting object. The normalization of the accretion disk K is related to the black-hole mass M , the distance to the source D and the inclination of the disk i .

$$K = M^{-2} D^{-2} \sin^2 i$$

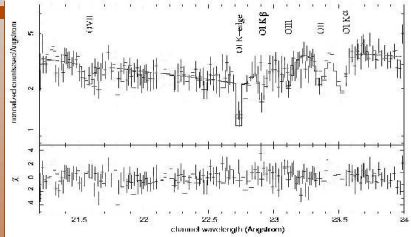
- (where $\beta = T_{\text{in}}/T_{\text{out}}$). The accretion rate depends on K and kT . We plot below
- Accretion rate vs. black hole mass derived from our fit to XMM spectra.
 - Assuming it was at L_{edd} at maximum in RXTE light-curve, corresponding L at time of XMM observation (a factor 6 fainter, 16% L_{edd}).
 - Assuming it was at a lower limit of 30% of the L_{edd} at maximum, corresponding L at time of XMM observations (5% L_{edd}).



Assuming $\beta=1.7 \Rightarrow 1.8M_{\odot} < M < 6M_{\odot}$

More details in: Sala, Greiner, Ajello, Bottacini & Haberl, A&A, 473, 561 (2007)

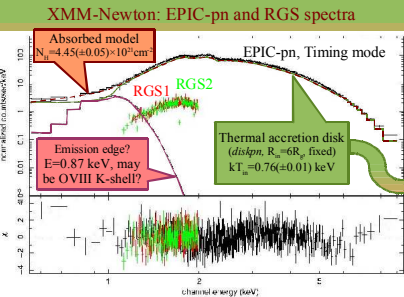
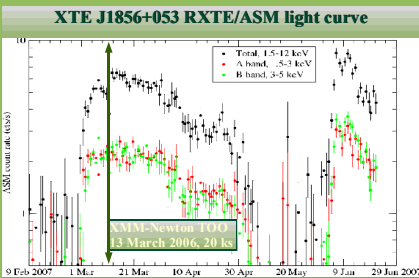
Interstellar oxygen lines in the RGS spectra



Identification	Measured $\lambda(\text{\AA})$	FWHM $\lambda(\text{\AA})$	Eq. width $\lambda(\text{\AA})$	F-test Probability	ISM rest-frame $\lambda(\text{\AA})$
O I K α	24.82 \pm 0.02	< 0.09	0.07 \pm 0.02	2.2×10^{-25}	24.807
O II K α	23.35 \pm 0.03	< 0.27	0.04 \pm 0.02	1.8×10^{-25}	23.340
O III K α	23.13 \pm 0.09	0.11(fixed)	0.03 \pm 0.03	6.3×10^{-22}	23.114
O IV K α	22.91 \pm 0.03	< 0.23	0.06 \pm 0.02	2.8×10^{-14}	22.887
O VII K α	21.60 \pm 0.06	< 0.80	0.04 \pm 0.03	1.6×10^{-25}	21.602
Observed $\lambda(\text{\AA})$			Depth (τ)		
O K edge	22.85 \pm 0.03		0.73 \pm 0.06		

On 28 February-1 March 2007 RXTE detected a new outburst of XTE J1856+053 (Levine et al. ATel#1024). XMM-Newton performed a TOO on 14 March 2007.

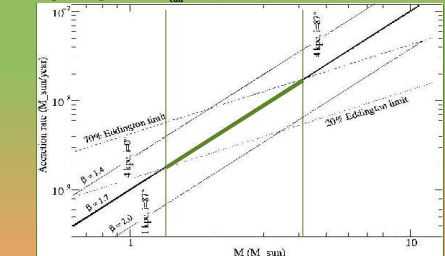
XTE J1856+053



The disk temperature favors a black-hole as accreting object.

Unabsorbed $L_{(0.4-10\text{keV})} @ 1\text{kpc} = 2.7(\pm 0.1) \times 10^{36} (D/1\text{kpc})^2 \text{ erg/s}$

- Assuming L_{edd} at the maximum in RXTE light-curve on June 2007, take as upper limit at the time of the XMM TOO 10% L_{edd} .
- As a lower limit, we take again 30% of the L_{edd} at maximum, corresponding to 20% L_{edd} at time of XMM observation.

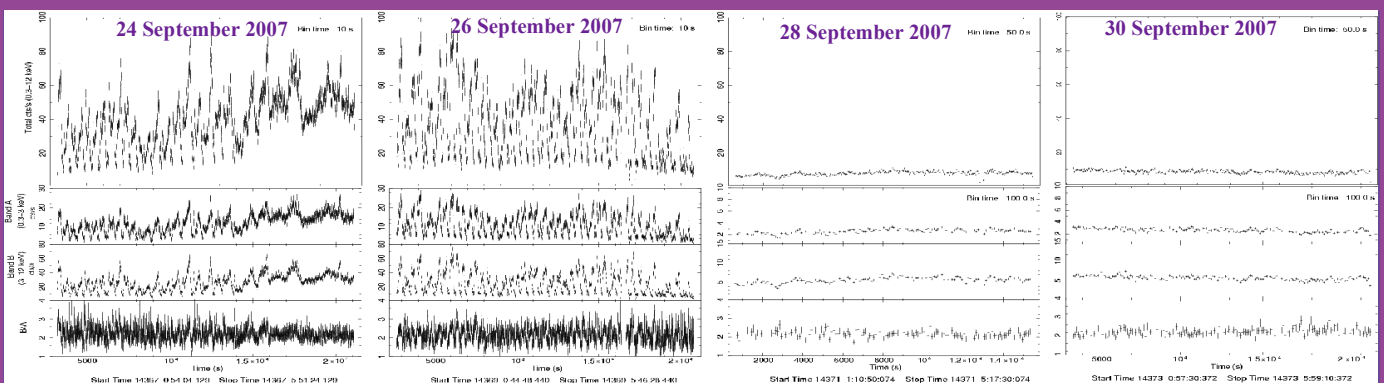


Assuming $\beta=1.7 \Rightarrow 1.3M_{\odot} < M < 4.2M_{\odot}$
Also constraint on the distance $\Rightarrow d > 1\text{kpc}$

More details in: Sala, Greiner, Ajello & Primak, A&A, submitted

GRS 1915+105

On 24, 26, 28 and 30 September 2007 a program of high time resolution simultaneous observations with XMM-Newton (with EPIC-pn in Burst mode) and VLT/ISAAC (with 14 ms exposures) was performed. In addition, RXTE, Swift and radio data (at RATAN-600) were obtained. The analysis of the multi- λ data is in progress. Here we show the XMM/EPIC-pn light-curves.



We thank Dr. Norbert Schartel and the XMM-Newton team for carrying out the TOO observations on XTE J1817-330 and XTE J1856+053. We acknowledge the quick-look results provided by the ASM/RXTE team.