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XMM–Newton observation of the Polar BL Hyi

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Abstract. A short serendipitous *XMM–Newton* observation of BL Hyi is presented.

1. The *XMM–Newton* observation of BL Hyi

BL Hyi was observed by *XMM–Newton* serendipitously, being in the field of view of another source, 1SAXJ0140.2-6748 (a candidate AGN). It was observed by both the MOS and the p-n instruments, but in the latter case a significant part of the emission was unfortunately on a gap. After data reduction, the good exposure time is 8.7 (6.4) ks in the MOS (p-n), about 2 orbital periods of the source. The 2–10 keV flux of the source is about 6×10^{-11} erg cm^{-2} s^{-1}, similar to what measured by *ASCA* and *BeppoSAX* in 1994 and 1996, respectively (Matt et al. 1998, hereinafter M98), but almost three times fainter than during the 1997 *RXTE* observation (Wolff et al. 1999). The total elapsed time covers about 2 periods of the source. In Fig. 1 the light curves (extracted over a region of 15" radius) in the 0.3-1 keV and 1-10 keV are shown. The two light curves are very similar each other, indicating no significant spectral variation. The two minima are also very similar, differently from what found during the *BeppoSAX* observation (M98), when accretion events onto the second pole were apparent.

Given the lack of spectral variability, we analysed the time–averaged spectrum. In the table, the results are summarized. The rather poor χ^2 is due to wiggles in the spectrum which do not seem to be associated with any spectral component, but are probably due to the poor knowledge of the response matrices far from the center of the detectors. No absorption, neither partial nor complete, is required by the data, at odds with what observed by *RXTE* (Wolff et al. 1999). The upper limit to the column density of a complete absorber is 3×10^{19} cm^{-2}, in agreement with the *ROSAT* finding (Ramsay et al. 1996). We find evidence for a black body component, with a bolometric luminosity about 20% that of the hard emission. The temperature and abundance of the

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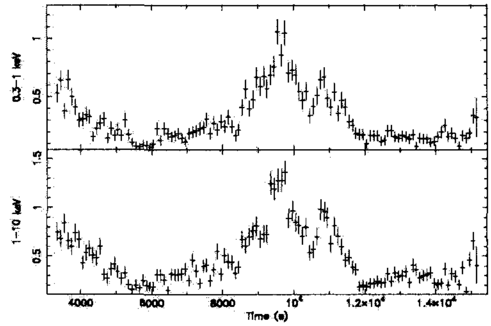

Figure 1. The 0.3-1 keV (upper panel) and 1-10 keV (lower panel) light curves.

latter component are in agreement with the values obtained in the *ASCA* and *BeppoSAX* observations (M98), when the source was in a similar flux state, and in the *RXTE* observation, when the source was three times brighter. Marginal evidence for a 6.4 keV iron line with EW$\sim$160$\pm$80 eV is also present.

kT (bb) [eV]	–	45^{+109}_{-16}
L_{bb}/L_{hard}	–	0.2
kT (hard) [keV]	$9.6^{+1.2}_{-1.0}$	$10.5^{+1.3}_{-1.3}$
A	$0.83^{+0.26}_{-0.25}$	$0.95^{+0.20}_{-0.27}$
χ^2/dof (F–test)	477/324	450/322 (99.99%)

Table 1. Models consist of: thermal plasma emission MEKAL with temperature kT(hard) and metal abundance A (in number with respect to solar), and (in the right column) also a black body component with temperature kT(bb).

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