

TTM Observations of X1755–338

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1 Observations

X1755–338 is an X-ray binary source which displays X-ray dips with a 4.4 hour period (White et al. 1984). It was previously noted as an unusually soft X-ray source by Jones (1977) and was suggested later as a black-hole candidate (BHC) by White & Marshall (1984), and White et al. (1984), based on the similarity of its location in an X-ray colour-colour diagram to that of a group of BHCs.

The *TTM* is a coded-mask imaging spectrometer on board the *KVANT* module of the *MIR* space station. It is capable of producing images in the 2 – 30 keV band with an energy resolution of about 18% at 6 keV. The instrumental details are given in Brinkman et al. (1985).

We observed X1755–338 in 1989 March–September during the period of the *TTM* Galactic Centre Survey.

2 Results

As shown in Fig. 1, the source intensity was variable during the observations. Variation of over 30% was seen on time scales from a few hours to several days. The X-ray intensity in 1989 August–September period appeared to be nearly twice that observed in 1989 March–April. The large data gaps in the *TTM* light curve prevent us from identifying any X-ray dips.

We have studied the X-ray spectra of X1755–338 accumulated during each observational day. We find that the source spectrum consists of an ultrasoft thermal component and a hard tail above $\sim 6 - 10$ keV, which is similar to the high state spectrum of the well known BHCs LMC X-1, LMC X-3 and GX 339–4, also observed with the *TTM*. To our knowledge, this is the first time that a hard tail has been observed from X1755–338.

We have modelled the spectrum with a multi-temperature disc blackbody (Mitsuda et al. 1984) and a power-law. We plot in Fig. 2 the spectrum obtained on 1989 March 31. A significant hard tail is seen above 10 keV. We have found that the soft and hard X-ray components of X1755–338 vary independently, as in the spectra of LMC X-1, LMC X-3 and GX 339–4 in their high (intensity) state.

The *TTM* observations strongly suggest that X1755-338 does indeed belong to the family of BHCs.

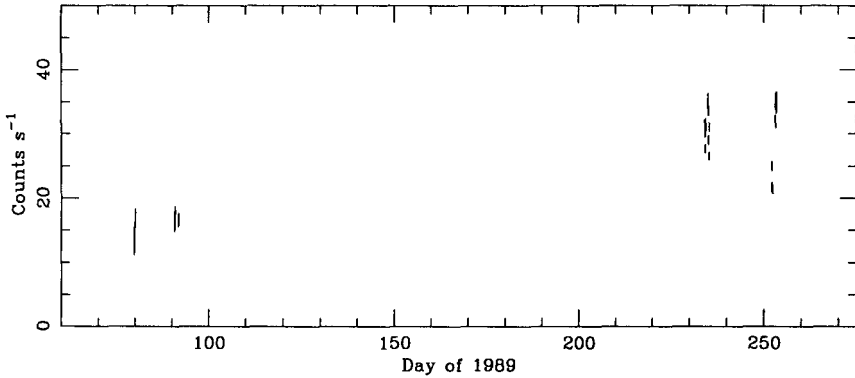


Fig. 1. X-ray (2 – 30 keV) light curve of X1755-338 in 1989 March-September.

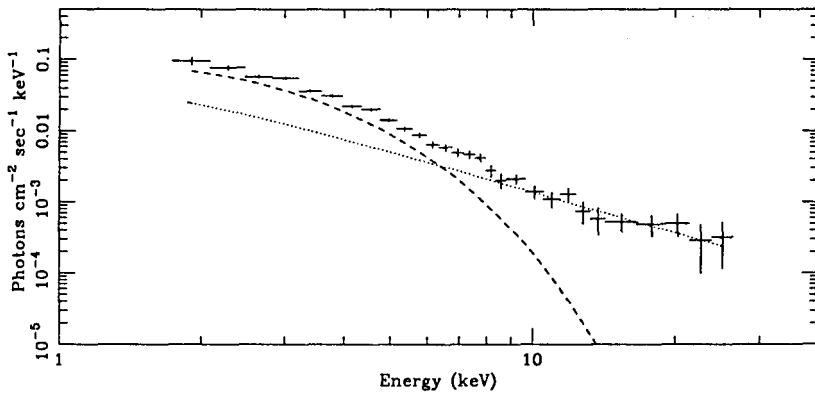


Fig. 2. X-ray spectrum X1755-338 on 1989 March 31. The soft and hard X-ray components are shown by the dashed line and by the dotted line, respectively.

References

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