Long-term Lightcurves of M31 X-ray Sources

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Abstract

M31 has been monitored by a *Chandra* GTO program, which used both the HRC and ACIS from 1999 to 2001 and a GO program, which used ACIS-S during 2000–2001. We report here the lightcurves of X-ray sources in M31 during the past two years.

X-ray sources in M31, like in our Galaxy, exhibit variability on long timescales (days to months). Some sources also show spectral state transitions, analogous to the soft/hard state of Galactic sources (like Cyg X–1 and GX 339–4). We present a statistical overview and also focus on some particularly interesting classes of sources.

Luminous ($> 10^{38}$ ergs s^{-1}) X-ray sources in M31 are often associated with globular clusters (Di Stefano et al. 2001); some of these luminous sources are variables, and the lightcurves provide clues to the nature of the compact object. We present data on a few intriguing globular cluster sources. We also present the spectral and time evolution of the X-ray transient near the nucleus (CXOGMP J004242.0+411608; Garcia et al. 2000), which has finally turned off after more than one year in outburst.

We compare the long-term X-ray lightcurves of M31 sources to those of Galactic sources (obtained by *RXTE*/ASM). Such a comparison allows us to probe the nature of M31 X-ray sources.

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