

THE SUPERSOFT SOURCE RXJ0019.8+2156: NEW PHOTOELECTRIC OBSERVATIONS

C. BARTOLINI, A. GUARNIERI, A. PICCIONI, L. SOLMI
*Department of Astronomy, University of Bologna,
Via Zamboni 33, 40126 Bologna, Italy
bartolini@astbo3.bo.astro.it*

1. The object

RXJ0019.8+2156 is a Supersoft X-ray Source (SSS) discovered by ROSAT and identified (Beuermann et al. 1995) as an object of magnitude $V=12.2$, brighter than any other known SSS. The mass function and the optical spectrum are similar to CAL 83, but the X-ray luminosity seems to be lower. The main light variations are: a cyclic modulation with a 15.8 h period and a 0.3 mag amplitude, a quasi-periodic pulsation less than 0.1 mag in 2 h (Beuermann et al. 1995), variations of about 1 mag over a time-scale of 20 yr and small irregular fluctuations on a time-scale of weeks to months (Greiner & Wenzel 1995).

The most promising model, at present, involves a binary system in which a hot $1 M_{\odot}$ white dwarf with an accretion disk is accreting at a mean rate of $\dot{M} \approx 10^{-7} M_{\odot} \text{ yr}^{-1}$; sporadic hydrogen burning caused by an unstable mass transfer (Greiner & Wenzel 1995) seems to be present.

2. New observations

We observed RXJ0019 in the V band at the Bologna Observatory with a two-head photometer (Piccioni et al. 1979) during five nights: 1994 December 26, 27 and 1995 January 7, 8, 9. Although fainter, the comparison star was more stable than RXJ0019, which sometimes showed some flickering; the observed differences of magnitude on 1994 December 26, 27 are shown in Fig. 1a, folded with the period $P = 0.6604565 \text{ d}$ (Greiner & Wenzel 1995).

Starting from the same brightness as in December, on January 8 and 9 the star showed a progressive increase of luminosity of 1.7 mag (Fig. 1b).

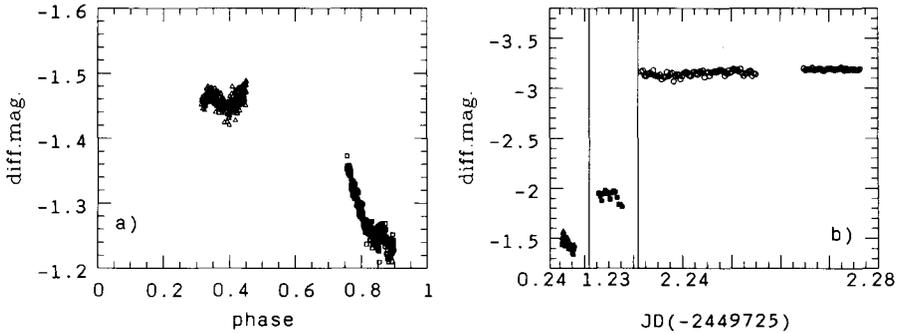


Figure 1. Bologna light curves: (a): on the nights 1994.12.26, 1994.12.27; (b): on the nights: 1995.1.7, 1995.1.8 and 1995.1.9

On January 7 and 8 the sky conditions were poor, with a quarter of moon, on January 9 the sky was photometric and the moon was further from the star, which showed fairly stable counts; therefore we are confident that the observed variation was real.

3. Discussion

We stress that the increase of brightness observed in 1995 January was stronger than any other previously observed variation and that it occurred in only 2 d, which is a typical time-scale for an outburst in a cataclysmic variable. However no outbursts seem to be present in the historical light curve (Greiner & Wenzel 1995). Such an increase of luminosity could be an indication that in RXJ0019 a CV phase is incipient.

The presence of flickering already noticed by Beuermann et al. (1995) and Greiner & Wenzel (1995) and confirmed by our observations, supports this idea.

References

- Beuermann, K., Reinsch, K., Barwig, H., et al., 1995, *A&A*, **294**, L1
 Greiner, J., Wenzel, W., 1995, *A&A*, **294**, L5
 Piccioni, A., Bartolini, C., Guarnieri, A., Giovannelli, F., 1979, *Acta Astronomica*, **29**, 463