

COMMISSIONS 27 AND 42 OF THE IAU
INFORMATION BULLETIN ON VARIABLE STARS

Number 4744

Konkoly Observatory
Budapest

7 August 1999

HU ISSN 0374 – 0676

RISE FROM THE LOW STATE OF THE BINARY V SAGITTAE

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V Sge is a peculiar eclipsing binary ($P_{\text{orb}} = 0^{\text{d}}514$) (Herbig et al. 1965). The spectrum consists of a hot continuum with strong emission lines and resembles the type WN5. Recently, there have been accumulated several lines of evidence (existence of the high-excitation emission lines (Patterson et al. 1998); X-ray variations (Greiner and van Teeseling 1998); the character of the long-term activity (Šimon and Mattei 1999)) which strongly support the model of the mass accreting white dwarf primary from a massive companion, originally suggested by Williams et al. (1986). V Sge appears to be a promising candidate for the super-soft X-ray source (SSXS) (Steiner and Diaz 1998; see van den Heuvel et al. 1992 for definition of SSXS).

V Sge displays very strong photometric activity (Herbig et al. 1965, Šimon 1996, Robertson et al. 1997, Šimon and Mattei 1999). The character of the activity changed from relatively isolated outbursts, seen in 1930's, to alternating high (HS) and low (LS) states, separated by transitions often of significantly shorter duration than the states. HS/LS behaviour is the most common kind of activity in V Sge during the last more than about 20 years.

We report on *UBV* observations of the rise from LS to HS which occurred in August 1997. The measurements were obtained with the 700/10500 mm Cassegrain telescope at Moscow Observatory of Sternberg Astronomical Institute. The star $V = 10.70$, $B - V = 0.29$, $U - B = 0.32$ located $1^{\circ}3' \text{ N}$, $6^{\circ}7' \text{ E}$ from V Sge was used as the comparison star. The check star was $V = 9.49$, $B - V = 0.15$, $U - B = 0.32$ ($0^{\circ}7' \text{ N}$, $18^{\circ}7' \text{ W}$ from the variable). Series of densely spaced measurements, covering up to several hours, were secured in most nights.

This rise was sufficiently slow to be resolved; it gave a rare opportunity to follow variations of the light curve through the LS/HS transition. The course in *V*-filter can be seen in Fig. 1a. The associated $U - B$ and $B - V$ indices are included in Fig. 1bc. The dots in Fig. 1bc are the individual measurements while the empty circles denote the nightly means. The horizontal lines in Fig. 1b and 1c mark the average color index for the whole transition, the mean $U - B$ and $B - V$ being -0.89 and -0.01 , respectively. On average, the points in Fig. 1c are grouping at progressively bluer $B - V$ index as the system brightens during the transition while $U - B$ does not exhibit any noticeable trend. Examination showed that orbital variations of the color (if any) are significantly smaller than those invoked by the long-term activity.

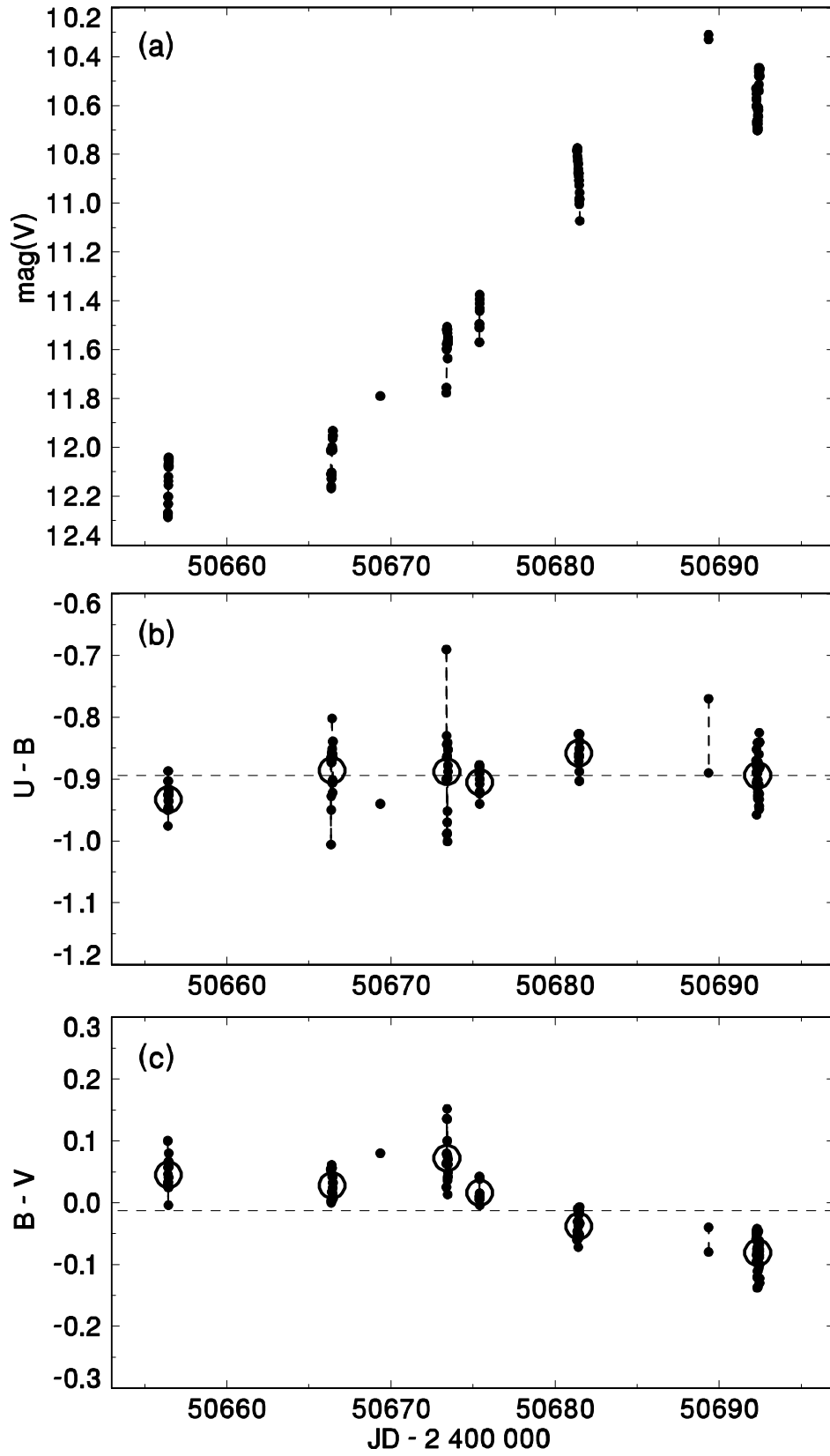


Figure 1. Rise from the low to the high state of V Sge. Observations obtained within a given night (dots) are connected by line. The empty circles in Fig. b and c mark the nightly means, the horizontal lines denote the mean color index for the whole transition.

No previous color changes for the LS/HS transition in V Sge have been published. Only Herbig et al. (1965) listed *UBV* observations of an outburst which occurred in the beginning of sixties — they therefore represent a kind of activity which has changed during the last decades (see Šimon and Mattei 1999). Both average color indices, determined from our data, agree within 0.03 mag with those of Herbig et al. (1965). Also the fact that $B - V$ decreases by ≈ 0.1 mag in the upper part of the rise to HS is similar to the behaviour of this index at the peak of the outburst observed by Herbig et al. (1965). It therefore appears that although the character of the activity in V Sge has changed since 1960's, the colors and their variations with the brightness level remained similar.

Acknowledgements: This research has made use of NASA's Astrophysics Data System Abstract Service. Investigation of cataclysmic variables with X-ray emission is partly supported by the project KONTAKT ME 137 by the Ministry of Education and Youth of the Czech Republic. This study was also supported in part by the Russian Foundation for Basic Research and the Council of the Program for the "Support of Leading Scientific Schools" through grants No 99-02-17589 and 96-15-96489.

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