

COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS

Number 3042

Konkoly Observatory
Budapest
3 July 1987
HU ISSN 0374-0676

1986 LIGHT CURVE OF V711 Tau*

The intrinsic light variability of the non-eclipsing binary V711 Tau has been observed by several investigators since 1976. The strong and variable emissions from chromosphere, transition region and corona and the short periodic light variability make the system the most suitable for studying the peculiar behaviour of RS CVn binaries. Mekkaden et al. (1982) made a detailed study of the photometric behaviour of V711 Tau during the interval 1976 and 1982 and found that the brightness at the light minimum remained nearly constant and the wave amplitude increased as the brightness at the light maximum increased. The observations of Bartolini et al. (1983) showed that drastic changes in light curves occurred within short time scales and interpreted the phenomenon as due to the latitude and longitude migration of spot groups. Rodono et al. (1986) explained the light curves of 1981-82 on the basis of a two-spot model; a large circular spot near the polar region and the other near the equator.

V711 Tau was observed with the ESO 50 cm telescope at European Southern Observatory, La Silla, through Strömgren uvby filters during 13 nights in October 1986. The observations were made differentially with respect to the comparison star HD 22484 and all measurements of V711 Tau included the fainter visual companion ADS 2444B. The instrumental magnitudes were transformed to the standard system by observing a sufficient

*Based on observations collected at European Southern Observatory, La Silla, Chile.

number of uvby standards. The photometric phases were calculated using the ephemeris of Bopp and Fekel (1976).

$$JD = 2442766.069 + 2.83782E^d$$

Figure 1 is a plot of y magnitudes. The mean error in y is of the order of 0.005 mag. The Strömgren y magnitudes can be converted to Johnson V values using the relation

$$V = y + 0.015(b-y) - 0.003 \quad (\text{Olsen, 1983}).$$

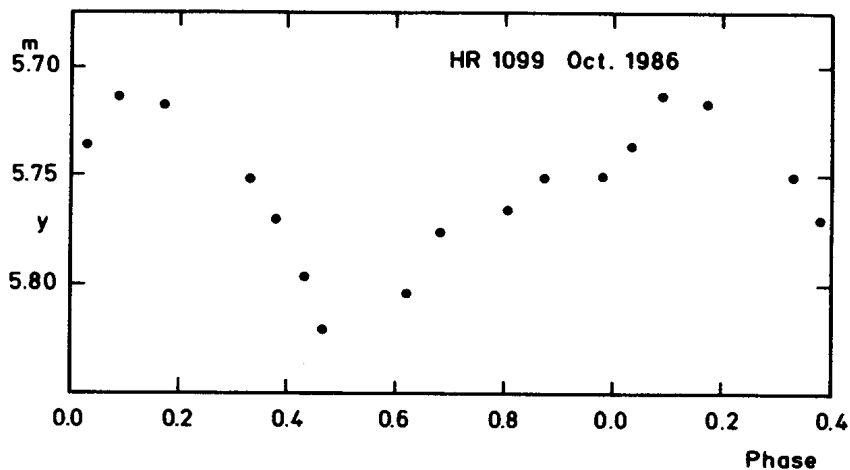


Figure 1

The maximum, minimum and mean brightness are 5.72, 5.82 and 5.77 mag respectively (in Johnson V). The light curve is nearly quasi-sinusoidal and the minimum occurs at 0.5P. the corresponding amplitude is approximately 0.10 mag.

The photometric observations by Wacker and Guinan (1986) during September 1985 and January 1986 showed a flat topped maximum and the minimum light occurred at 0.41P. The unpublished observations of 1984/85 exhibited a quasi-sinusoidal light curve with minimum near 0.40P.

Major changes in locations and areas of spot groups took place within an interval of two years. The shape of the light curve changed from quasi-sinusoidal to flat topped maximum and back to a nearly quasi-sinusoidal one, while the maximum light level decreased from 5.63 mag in 1984/85 to 5.72 mag in 1986 and the phase of the minimum advanced by 0.10P. In a very active binary like V711 Tau, exhibiting abrupt changes in light curve and emission line features, areas of activity and therefore spots appear at several locations on the surface and these spots merge or disintegrate within a short time scale. Hence, though the light variations can be reproduced by a two spot model, the model may not represent the real picture of spot groups that are responsible for the sudden changes in activity.

M.V.MEKKADEN^{1,2}

¹Sternwarte Bonn
Auf dem Hügel 71
5300 Bonn, F.R.Germany

²Indian Institute of Astrophysics
Bangalore, India

References:

- Bartolini, C., et al. 1983, *Astron.Astrophys.*, 117, 149
Bopp, B.W. and Fekel, F.C.:1976, *Astron. J.*, 81, 771.
Mekkaden, M.V., Raveendran, A.V. and Mohin, S.:1982, *J. Astrophys. Astr.*, 3, 27.
Olsen, E.H.:1983, *Astron. Astrophys. Supl.*, 54, 55.
Rodono, M., et al. 1986, *Astron.Astrophys.*, 165, 135.
Wacker, S.W. and Guinan, E.F.:1986, *I.B.V.S. No.2903.*