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PERIODIC LIGHT VARIATIONS OF V 603 Aql*

During July and August 1981 a total of 1510 UB_V-measurements of the old nova V 603 Aql has been obtained (partly simultaneously with polarimetric observations) using the ESO 50cm telescope equipped with the single-channel standard photometer. An integration time of 30s per filter has been applied as a compromise between precision and time resolution. The resulting error for a single measurement was then about 0.^m01. Most of the 13 observing runs cover a time interval of about six hours.

A repeating hump structure is clearly visible in all 11 runs which span at least the orbital period of 0.^d13854 as derived spectroscopically by Kraft (1964). A periodogram analysis yielded a photometric period of 0.^d144854 which is about 4.6% longer than the spectroscopic one. Fig. 1 shows a phase diagram of all V-measurements representing the averaged V-light curve. The U- and B- light curves also reveal the same general behaviour: The hump lasts about half the period and its amplitude is around 0.^m15. The large scatter results from the fact, that minimum light and especially the amplitude and shape of the hump is changing from cycle to cycle (Fig.2). B-V remains nearly constant whereas U-B is slightly bluer in the rising part of the hump.

In most cases the hump is divided into several peaks. The elements

$$\text{HJD } 244\,4816.387 \pm 3 + 0.144\,854 \pm 8 \text{ E}$$

refer to the mean position of that peak, which is always present and which is usually, but not always, the brightest.

*Based on observations collected at the European Southern Observatory.

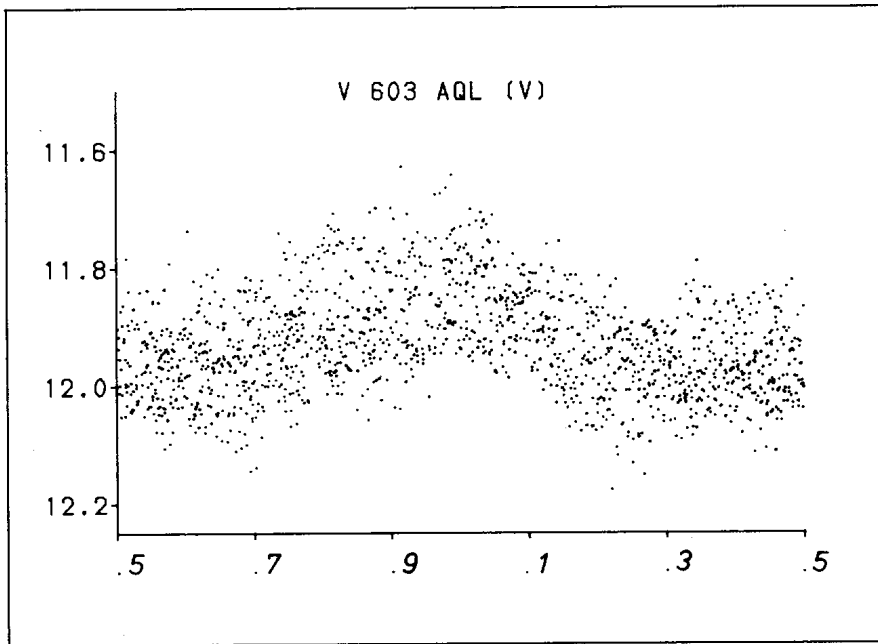


Fig. 1 All V-magnitudes folded with the $0.^d.144\ 854$ period.

Fig. 2 shows examples where an additional peak is present before or after the reference peak. Sometimes a pronounced secondary hump appears near phase 0.5 with an amplitude up to half that of the primary hump.

Until now only two papers have been published reporting on longer observation runs of V 603 Aql. Rahe et al. (1980) detected eclipselike features with approx. Kraft's period in an eight hour run. Slovak (1981) failed to find any periodic features in his five runs, of which only two cover the orbital period. It might be that such features only can be identified when the mean light level of the system is low (Rahe et al.: $V \sim 11.8$, Haefner: $V \sim 11.9$), otherwise (Slovak: $V \sim 11.4$) they might be masked by a strong flickering activity. On the other hand the two broad maxima in the light curve of Rahe et al. do not fit the ephemeris given above.

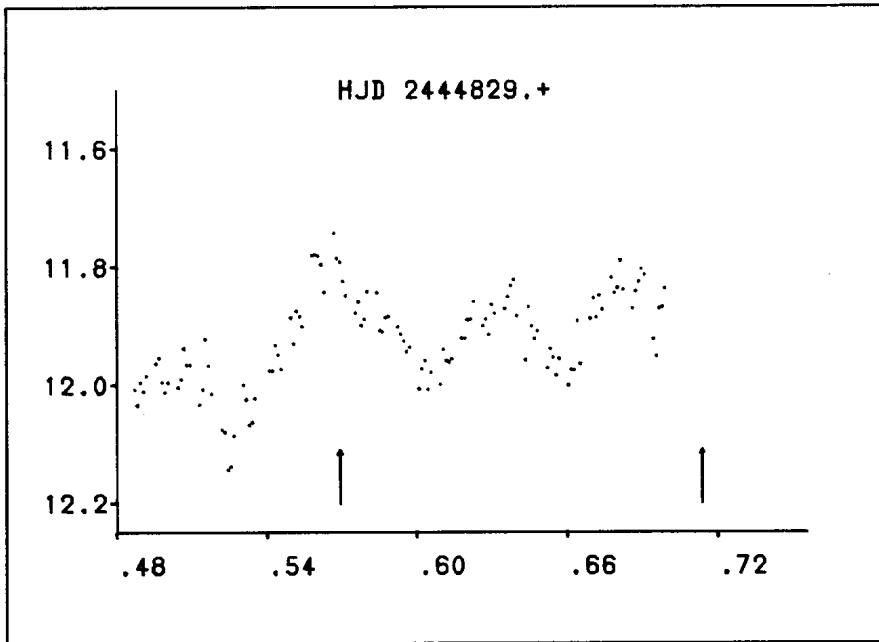


Figure 2/a

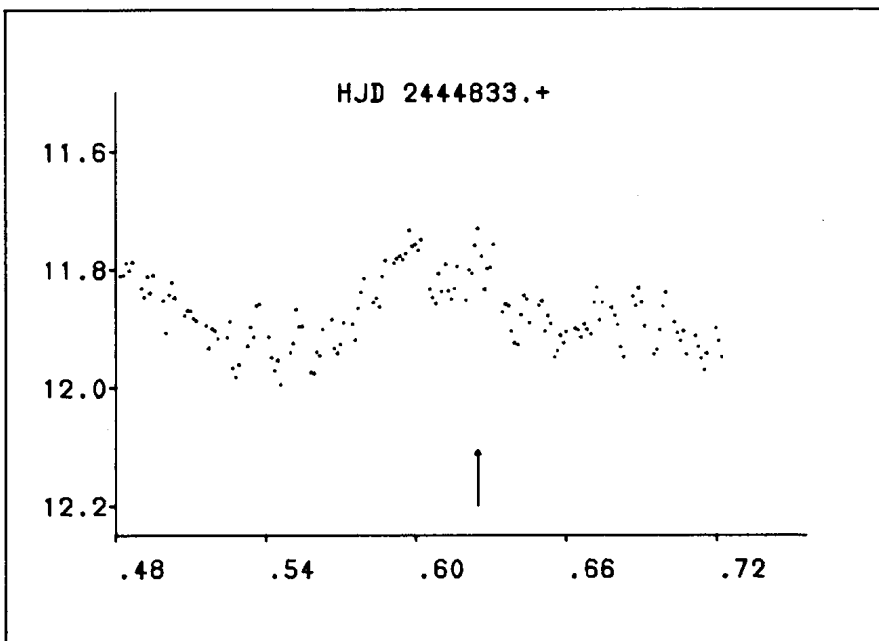


Figure 2/b

Fig. 2 V-magnitudes as a function of Heliocentric Julian Date. The times of maxima are indicated by arrows.

If new spectroscopic observations prove the period found by Kraft (which has been checked to be correct by Slovak (1981) and the author), then the first of the two models proposed by Cook (1981) to explain light variations in a low inclination system is very promising. In that model a small orbital eccentricity modulates the mass transfer and leads, because of apsidal motion, to a variable brightness with a period which is slightly longer than the spectroscopic one. Detailed results of this photometry and the polarimetry will be published elsewhere.

R. HAEFNER
Universitäts-Sternwarte
Scheinerstr. 1
D-8000 München 80
Germany

References:

- Cook, M.C. 1981, Mon. Not. R. Astr. Soc. 195, 51P
Kraft, R.P. 1964, Astrophys. Jour. 139, 457
Rahe, J., Boggess, A., Drechsel, H., Holm, A., Krautter, J.
1980, Astron. Astrophys. 88, L9
Slovak, M.H. 1981, Astrophys. Jour. 246, 1059