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ON THE PRIMARY MINIMUM OF ECLIPSING BINARY AY Cam

The eclipsing binary AY Cam (= BV 363 = BD + 77° 0328) was discovered by Strohmeier and Knigge (1961). They assigned it a period of $1^d.367485$. The photographic light curve is of Algol type with no indication of secondary minimum, the range of light variation being $9^m.9$-$10^m.75$. According to McDonald (1964) the spectral type of AY Cam is GO, while GÖtz and Wenzel (1966) reported its spectral type as A5. Tempesti (1969) gave photoelectric light curve of the system in V light along with the geometrical elements based on Russell- Merrill method. The period given by him is $2^d.7349658$.Using Wood's method, Milano and Russo (1979) reanalysed the normal points given by Tempesti (1969) to get a set of photometric and geometric elements for AY Cam. Brancewicz and Dworak (1980) gave the elements of AY Cam based on a period of $1^d.367480$. However, the General Catalogue of Variable Stars Vol. I. 1985 (Editor-in-Chief Dr. P.N. Kholopov), reports the period determined by Tempesti (1969).

AY Cam has been observed on five nights in 1978 and 1979 on the 56 cm reflector of Uttar Pradesh State Observatory, Naini Tal through Standard U, B and V filters, using 1P21 photomultiplier and employing d.c. technique. BD + 77°329 has been used as the comparison star. The standard error of observations is $0^m.008$ for B, V and $0^m.018$ for U filter. The time of minimum (primary) has been determined by Kwee and Van Woerden (1956) method and the mean for U, B and V is as follows : -

Prim. Min. = JD(Hel) 2443876.3233 $\pm$.0003

The differential magnitudes (Comp. - Var.) in all the three filters U, B and V have been plotted in Fig. 1.
The duration of totality in V filter is about $0^d.05$. The depths of the primary minimum in U, B and V filters are $0^m.51$, $0^m.55$ and $0^m.65$ respectively.

Tempesti (1969) published the observed light curve and normal points in V filter. From the observations he concludes that the consecutive minima differ both in depth and in shape. The secondary minimum is $0^m.03$ brighter than the primary and shows a constant light lasting $0^p.02$, while the primary minimum shows no constant light.

This led him to double the period given by Strohmeier and Knigge (1961).

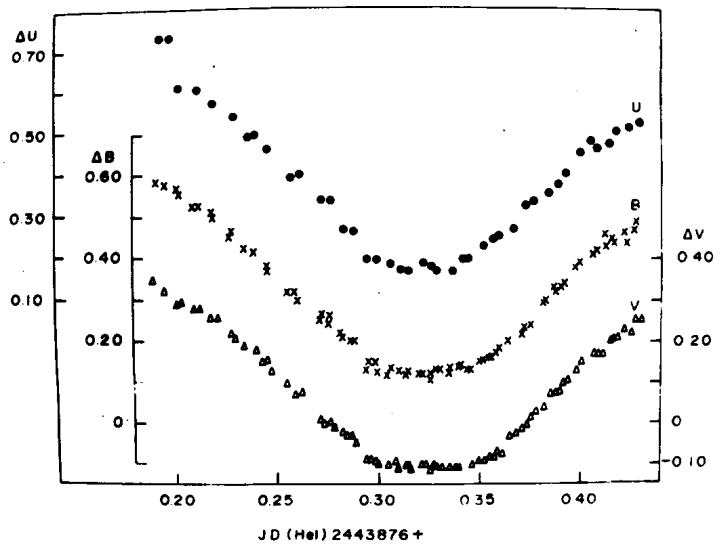

Figure 1: Primary minimum of AY Cam.

The light curve of AY Cam given by Tempesti (1969) shows a scatter of $0^m.05$ outside the eclipse. Therefore, it is possible that the magnitude difference of $0^m.03$ between consecutive minima may be due to this scatter as the star is not bright ($10^m.26$ at minimum) enough for a 15.5 in. refractor, and due to this scatter the constant light during primary minimum is not noticeable for a particular night's observations or else the depth and shape of primary minimum is variable. This remark is based on the fact that our light curve of the principal minimum of AY Cam shows a constant light of $0^d.05$ which is almost equal to the duration of constant light in the secondary minimum by Tempesti (1969).

Therefore , we conclude that the period of AY Cam is $1^d.367485$

as given by Strohmeier and Knigge (1961).

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