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# NEW EPHEMERIS AND LIGHT CURVES OF DD MONOCEROTIS

The first ephemeris of DD Mon (HD 292319) was given by Ahnert et al. (1947). Wachmann (1968) later published a photographic light curve and obtained a revised ephemeris :

$$\text{Min.I} = \text{HJD}\,2430321.453 + 0^{\text{d}}.56801193 \times \text{E} \qquad (1)$$

Yamasaki et al. (1990) gave the first photoelectric light curves, but they did not publish their times of light minima. They used Wachmann's light elements to compute the phases of their observations and applied the correction of $-0^{\text{p}}.108$ in their analysis.

New photoelectric observations of DD Mon were carried out with the 1.0 m telescope at Yunnan Observatory, Academia Sinica, during seven nights in January and February 1996. The B and V filters approximate Johnson's standard UBV system. HD 292321 and HD 48867 were chosen as comparison and check stars, respectively (the same stars were used by Yamasaki et al. 1990). Nightly extinction coefficients were determined from the observations of the comparison star. The observational accuracy throughout the observing period as derived from the magnitude difference between the check star and the comparison star is $0^{\text{m}}.012$. (V) and $0^{\text{m}}.013$ (B). Altogether, 403 V observations and 358 B observations have been obtained for DD Mon.

From Yamasaki et al.'s and our observations, seven times of light minima have been determined by using quadratic fitting method, and have been listed in Table 1. All available times of light minima were introduced into a least squares solution to derive the new ephemeris:

$$\begin{array}{l}\text{Min.I} = \text{HJD}\,2450099.7888 + 0^{\text{d}}.56802738 \times \text{E} \\ \qquad\qquad\quad \pm 17 \qquad\qquad\quad 34\end{array} \qquad (2)$$

In Table 1 the $(\text{O}-\text{C})_2$ residuals were calculated by using this new formula and the $(\text{O}-\text{C})_1$ were calculated by using Wachmann's ephemeris. The determined light minima are too few to study the period change of the system. More observations for DD Mon are necessary to know the period behaviour of this binary.

Table 1. Moments of light minima and O−C residuals of DD Mon

| JD.Hel. | Filter | Min. | $(\text{O}-\text{C})_1$ | $(\text{O}-\text{C})_2$ |
|---|---|---|---|---|
| 2446411.3042(14) | B,V | II | +0.0613 | +0.0011 |
| 2446420.1085(9) | B,V | I | +0.0614 | +0.0011 |
| 2446443.1111(9) | B,V | II | +0.0607 | −0.0012 |
| 2446443.9643(19) | B,V | I | +0.0595 | −0.0014 |
| 2450099.7908(4) | B,V | I | +0.1624 | +0.0020 |
| 2450123.6447(4) | B,V | I | +0.1598 | −0.0012 |
| 2450127.6213(4) | B,V | I | +0.1603 | −0.0008 |

(The first four times of minima were determined from Yamasaki et al.'s (1990) observations)

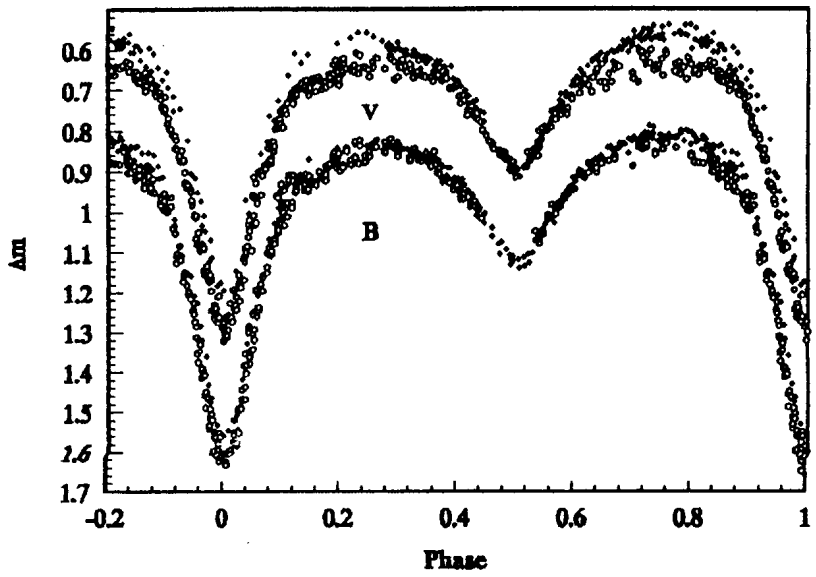


Figure 1. B and V light curves of DD Mon. The open circles show the present observations and the filled circles indicate Yamasaki et al.'s observations in 1985 and 1986

The light variations of DD Mon relative to HD 292321, in the sense variable minus comparison are shown in Figure 1 as open circles. The filled circles indicate the 1985/1986 observations published by Yamasaki et al. (1990). The maximum brightness of our light curves was fainter by $0\overset{m}{.}03$ (B) and $0\overset{m}{.}08$(V), and the minimum brightness was also fainter by $0\overset{m}{.}08$ (B) and $0\overset{m}{.}12$ (V) as compared with the 1985/1986 observations. The photometric asymmetries (O'Connell effect) on Yamasaki et al.'s (1990) light curves are not seen on our light curves. The photometric disturbances between 0.25-0.36 phases on their light curves were shifted to phases 0.16-0.25. The variation of the light curves may be caused by the evolution of the system and/or the stellar activity. The light curve analysis using WD synthesis method will be published elsewhere.

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References:

Ahnert, P., Hoffmeister, C., Rohlfs, E., and van de Voorde, A., 1947, *Veröff. Sternw. Sonneberg*, **1**, No. 2

Wachmann, A.A., 1968, *Astron. Abh. Hamburger Sternw. Bergedorf*, 7, No. 8

Yamasaki et al., 1990, *Astron. J.*, **99**, 1218