

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

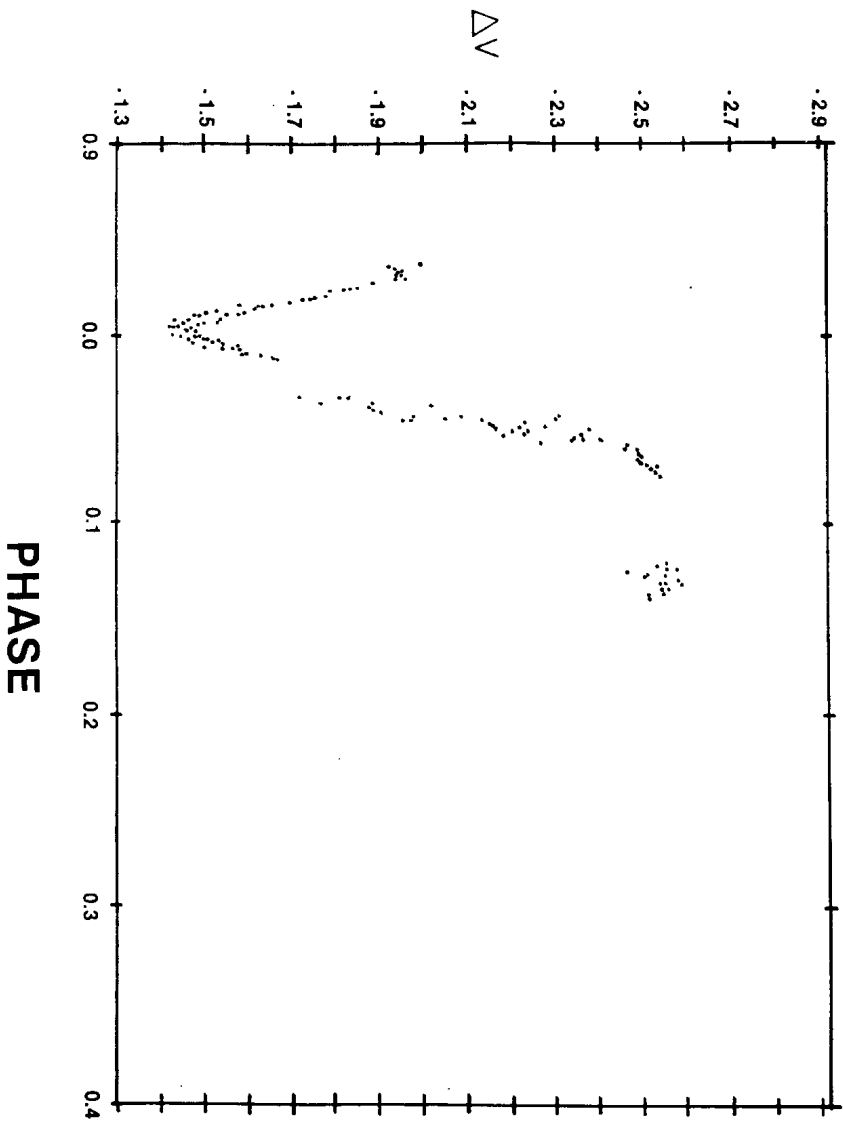
Number 2127

Konkoly Observatory
Budapest
1982 April 21
HU ISSN 0374-0676

PHOTOELECTRIC MINIMUM TIMINGS OF ALGOL

The Algol system was observed from July, 1981 through December, 1981 with the 20 cm Newtonian reflector and photoelectric photometer described by Bower (1982). The Optec photometer uses a silicon photodiode and has a diaphragm which covers an area of sky 2.9 in diameter. The comparison star was Pi Persei which is approximately 3° away from Algol. The sequence of observation was: comparison - comparison background - variable - variable background - comparison - comparison background. All observations were corrected for differential extinction, with an assumed extinction coefficient of 0.25^m , and were transformed to V of the UBV system. Since the comparison and variable stars are close together and were observed when both were at least 30° above the horizon, the error in the assumption that the extinction coefficient was 0.25^m is reduced.

Figure 1 presents the observations, plotted as a function of phase according to the ephemeris that will be calculated from the times of minimum presented here. A list of the observations is available as IAU Commission 27 File No. 98. Assuming that the light curve described a parabolic function, a least-squares fit of the light curve yielded the following times of minimum: HJD 2444904.60 \pm 0.05 and HJD 2444947.62 \pm 0.05. A minimum between the two



determined minima, HJD 2444924.68 \pm 0.05, was selected as the epoch for equation (1). (O-C) residuals were calculated for the ephemerides from Guinan et al. (1976) and Kukarkin et al. (1969) and are listed in Table I.

A new period was determined from each of these two ephemerides by the following method. Each (O-C) residual was divided by the respective number of cycles that had elapsed since the given epoch. This value was added to the published value of the period, and the new periods are listed in Table I.

Table I

Paper	(O-C)	(O-C)/E	Period
Guinan et al. (1976)	0.0635	0.000044813	2. ^d 8672208
Kukarkin et al. (1969)	-0.0489	-0.000025750	2. ^d 8673643

The average of the new periods is 2.^d86729 \pm 0.^d00010. The ephemeris calculated from the analysis of this light curve is:

$$\text{Pr. Min.} = \text{HJD } 2444924.68 + 2.^d86729 E \quad (1) \\ \pm 0.05 \pm 0.^d00010$$

The analysis of this light curve does not take into account the three types of variation in the interval between times of minimum in the Algol system: one with a period of 1.^y8 due to the orbital motion of Algol AB around Algol C; one with a period of 33y, due to apsidal motion; and a long-term variation described by Batten (1973).

I am grateful to R. M. Genet and N. D. Morrison for their assistance in the preparation of this paper.

GARY A. BOWER
Fulton Observatory
1203 Labrador Blvd.
Garden City, KS 67846
USA

References:

- Batten, A. H.: 1973, Binary and Multiple Systems of Stars (Oxford: Pergamon Press), pp. 86-92.
- Bower, G. A.: 1982, IAPPP Communications, in press.
- Guinan, E. F., McCook, G. P., Bachmann, P. J., and Bistline, W. G.: 1976, Astron. J., 81, 58.
- Kukarkin, B. V. et al.: 1969, Gen. Cat. of Var. Stars, Moscow.