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PHOTOELECTRIC OBSERVATIONS OF THE ECLIPSING VARIABLE β PERSEI

The famous eclipsing binary system Algol was observed during 26 nights, Sept.-Dec. 1983, with the new 40 cm Cassegrain telescope of Al-Battani Observatory, (Iraq, Tarmiya, Latitude $33^{\circ}47'32''$ N, Longitude 44° $22'28.6''$E) using a photoelectric photometer equipped with an unrefrigerated IP 21 photomultiplier tube. The observations were made in UBV filters which are approximately in the standard system. The probable errors of a single observation were estimated to be about ± 0.01 in the three colours, i.e. corresponding to a measure of the observational scatter at a particular phase. The variable was observed differentially with respect to the comparison star σ Per. The star α Per was observed occasionally in order to check the comparison for any variability but no significant variations were detected between σ and α Per.

The raw data were reduced to about 450 points in each filter. Since the variable and comparison were separated by about 10°, a great care was taken in applying the differential extinction corrections. The extinction coefficients were calculated from the observed apparent magnitude and the outside atmosphere magnitude of the comparison for each night, i.e.,

$$k_u = 0.48, \qquad k_b = 0.36, \qquad k_v = 0.25$$

Figures 1 and 2 show the UBV light curves and the colour indices U-B, B-V for Algol, respectively. Minimum times were determined:

J.D. Hel. 2445614.2740, O-C = 0.002 Min II
J.D. Hel. 2445641.5135, O-C = 0.002 Min I
J.D. Hel. 2445654.4163, O-C = 0.002 Min II

The phases of the present observations, Epochs and O-C's were calculated according to the light elements given by Ashbrook (1976) as:

$$J.D. = 2440953.4657 + 2^{d}.8673075\ E$$

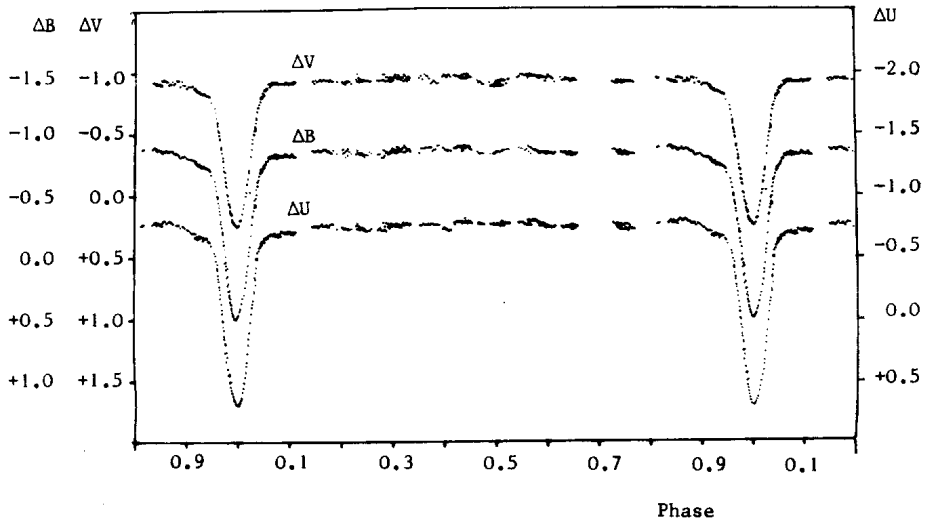

Figure 1

UBV Light Curves for Algol (β Persei)

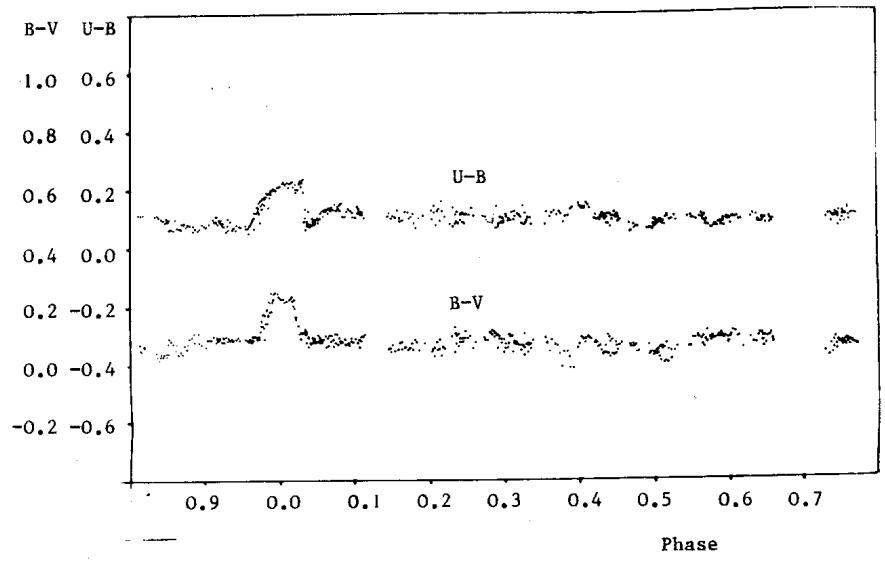

Figure 2

Colour Indices for Algol (β Persei)

The amplitude in V was (1.27 ± 0.01) magnitude. Our observations indicate the existence of asymmetry, especially in the beginning of the descending part of primary minimum. The difference was approximately $0^m.12$, (Figure 1). This phenomenon can be explained as a result of the presence of a gaseous stream flowing from the secondary to the primary component, starting off roughly in the vicinity of the inner Lagrangian point and falling behind the primary as that star moves round in its orbit (Walter, 1980, or Al-Naimiy and Budding, 1977).

HAMID M.K. AL-NAIMIY, ALI A.A. MUTTER, HASSAN A. FLAIH
and ALIA H.A. AL-ROUBAIE

Council for Scientific Research
Space and Astronomy Research Centre
Jadriyah, P.O. Box 255, Baghdad,
Iraq

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