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1987 - 1989 UBV PHOTOMETRY OF OO AQUILAE

New UBV observations of a contact binary OO Aql were made in 1987,1988 and 1989 observing seasons with a single channel photometer attached to the 30 cm Maksutov telescope of the Ankara University Observatory. The same comparison star BD +8° 4220 was chosen as in Demircan and Güdür (1981), and Lafta and Gringer (1986) for nearness in position and brightness to OO Aql. However its spectral type A2 is much earlier than the spectral type G5 of OO Aql. The differential extinction correction of the brightness measurements was found negligibly small, due to proximity of the comparison star to OO Aql. The times of the individual observations were also corrected for the light time variation by reducing them to the Sun's center and the phases were calculated by using the light elements given by Demircan and Güdür (1981), as

$$\text{Min I JD Hel. } 2442218.51607 + 0^{d}.5067848 \times E$$

Altogether 488, 494 and 494 differential magnitudes of OO Aql in U,B and V bandpass, respectively were obtained. The observations are shown in Fig. 1 together with the (B-V) and (U-B) color curves. The light curves in Fig.1 show that the eclipses seem partial although Hrivnak's (1989) solution of the Binnendijk's (1968) light curves requires about seven minutes totality in the secondary minimum. The present observations are, in fact, not sensitive to distinguish such short time totality. This prediction could be checked by more sensitive observations in the secondary minimum. The second important point seen in the light curves is the bandpass independent large depths(1.0 and 0.8 mag.) of the primary and secondary minima. An O'Connell

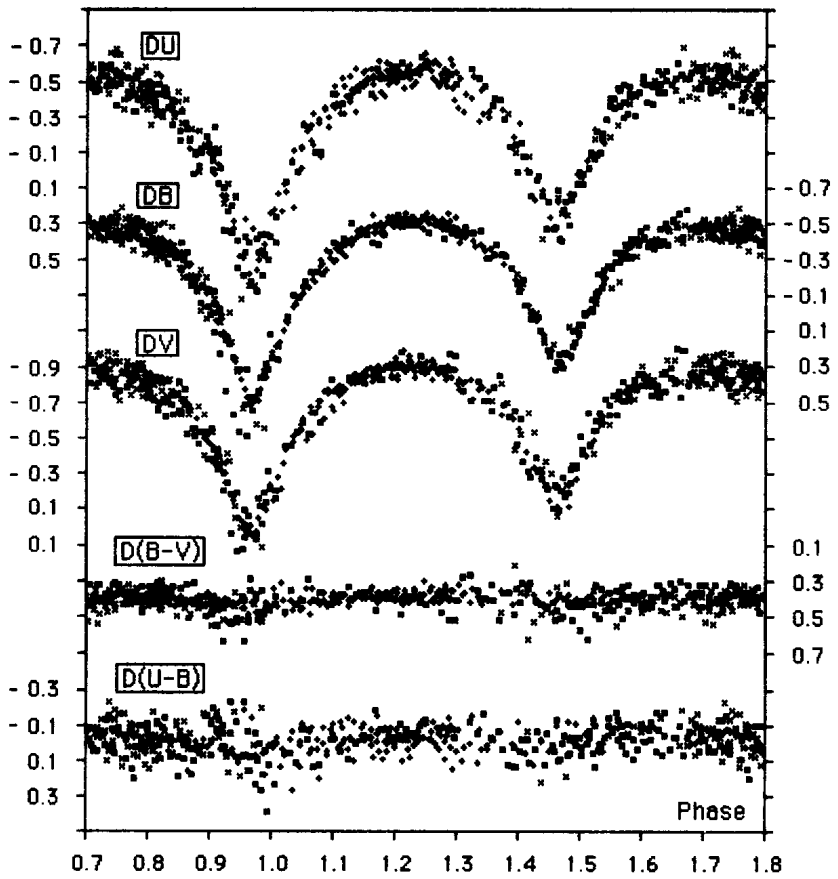

Figure 1. The light and color curves of OO Aql. The cross (x), plus (+), and the square (□) signs are used for the observations of 1987, 1988 and 1989 observing seasons, respectively.

effect as 0.05 mag higher primary maximum is also observable which is probably due to non-homogeneously distributed magnetic starspot activity or a mass transfer from hotter primary to cooler secondary. The system is shown spectroscopically as an A-type contact binary by Hrivnak (1989). The spectroscopic mass ratio q=0.843 of the

components obtained by the same author is one of the largest among the contact binaries is not much different from previously obtained photometric value q=0.824 by Twigg (see Mochnacki 1981). Other photometric observations, all in B and V bandpass, were obtained by Binnendijk (1968), Demircan and Güdür (1981), and Lafta and Gringer (1985). The spectroscopic observations by Hrivnak (1989) showed that the system has G5 spectral type and has no obvious Ca II emission as a measure of magnetic activity.

Our observations show slight reddening in both minima (see the color curves in Fig. 1), and the level of maxima and minima, and thus depths of minima are all variable in time.We think the system deserves further more systematic observations in order to understand the time dependent variability.

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