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THE OPTICAL BEHAVIOUR OF THE POLAR AM Her IN 1984

On the base of the sequence of comparison stars given by Hudec and Meinunger (1977) the star was measured on 160 blue-sensitive (ORWO-ZU21+GG13+BG12) and on 17 photovisual(ORWO-RP1+GG14) plates from 53 nights taken with the 50/70/172 cm Schmidt camera of Sonneberg Observatory covering the time interval between 1984 March 3 and 1984 November 29. In 37 nights more than one plate per night were obtained.

The long time light curve in B and V are shown in Figure 1. Like in the series of the years 1982 and 1983 two different states of the brightness behaviour of AM Her can be seen there. Concerning the active state, which is characterized by increased brightness caused by X-ray heating it is remarkable that the mean brightness amounts to $\bar{B}\approx14^{m}.0 \pm 0^{m}.5$. This brightness behaviour which is similar to that of the series 1982 and 1983 is situated about 1.2 mag below the known maximum brigthness obtained from sky patrol plates and known from the long time light curve of former years given by Hudec and Meinunger (1977).

Numerous plates are obtained in the low state of the star. They permit to study the occultation light changes in that state.

A relationship given in Figure 2 was found between the measured B magnitudes and the derived colour indices B-V. The diagram, where increasing brightness goes with decreasing colour index contains also the data of the flare, which was observed in 1983 (Götz, 1984a) and in its lower part photometric observations published by Mazeh, Kieboom and Heise (1983).

The circles drawn in Figure 2 represent mean colour indices from more than one determination per night while colour indices (B-V) which were derived from nearly synchronous observations of our own series (B) and visual estimations given by Verdenet (1982-1984) are marked by crosses. But up to now the given relationship is still incomplete especially in the lower ranges of brightness.

In order to study the influences of occultation light changes to the overall light curve, all observations were reduced by means of the improved orbital elements.

Figure 1

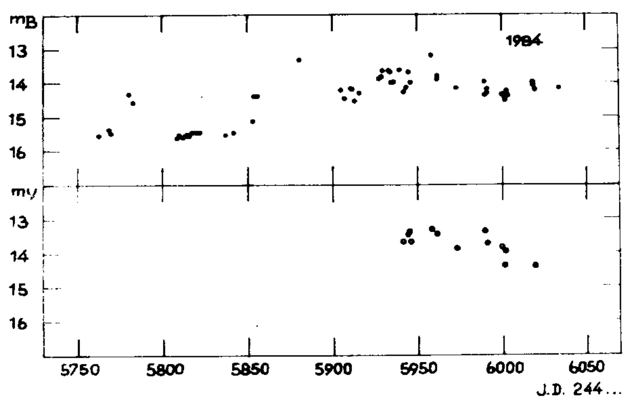


Figure 2

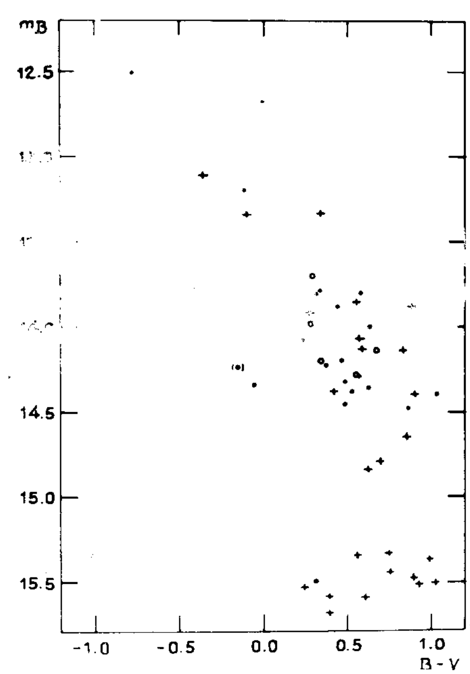


Figure 3

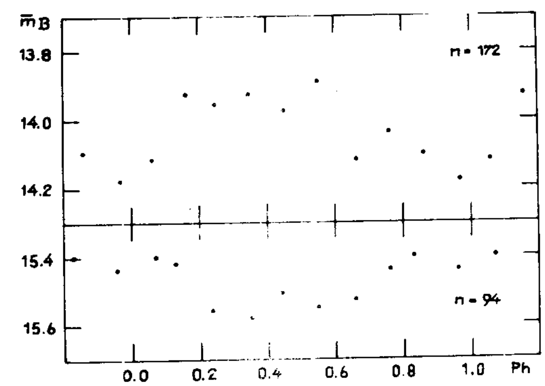
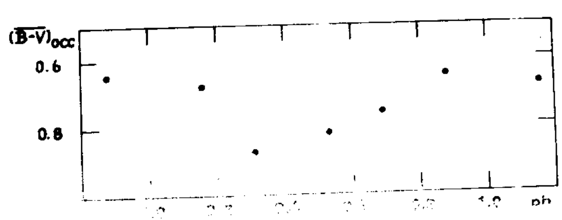


Figure 4



$$Min_{hel} = 244\ 5406.576 + 0^{d}.1289273 \cdot E \quad \text{(Götz, 1984b)}$$

to one common epoch.

The result is given in Figure 3, where the mean magnitudes $\bar{B}$ obtained separately from all observations of the high and the low states are plotted against the phases. The number of observations used from each state are drawn in. From Figure 3 it can be seen that in the low state the minimum phase is displaced to ph = 0.35.

The behaviour of the colour indices caused by the occultation light changes is shown in Figure 4. There, the mean colour indices $(\overline{B-V})_{occ}$ obtained reducing the observational data to $B = 14\overset{m}{.}5$ by means of the given colour magnitude relation are plotted against the phases. The result is nearly in agreement with that given by Priedhorsky and Krzeminski (1978). After that the largest colour indices can be expected at the phase ph≈0.30 while the lowest values are attributed to the minimum phase.

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