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SOME REMARKS ON THE CLOSE BINARY X-RAY SOURCE AM Her

In studying the long time behaviour the star was inspected on 56 blue-sensitive plates (ORWO-ZU 21 + GG13 + BG 12) taken with the 50/70/172 cm Schmidt camera of Sonneberg Observatory covering the time interval between 1982 April 15 and 1982 September 24. The exposure time of these plates varies between 5 and 30 minutes. In 11 nights more than one exposure per night were obtained. The used sequence of comparison stars in B is given by Hudec and Meinunger (1977).

The long time light curve in B is shown in Figure 1.

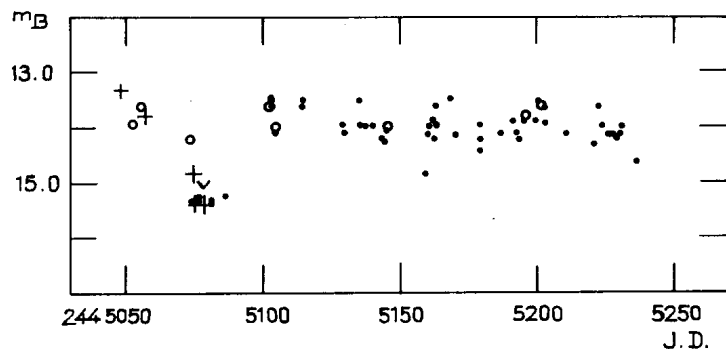


Figure 1

There, the plotted estimations from Schmidt plates (·) are supplemented and completed by observations on blue-sensitive sky patrol plates (o) of Sonneberg Observatory and by visual observations (+) published by Verdenet (1982), Mattei (1982)

and Magalhaes (1982) and reduced to B according to the statements of Patterson and Price (1980) and Szkody (1978).

In the long time light curve of Figure 1 two different states of the behaviour of AM Her can be seen. The low state could be observed from 1982 April 15 to 1982 April 27; according to the light curve it could not have lasted longer than 4 weeks and was thus extremely short. This state is identical with the inactive state of the system which is characterized by minimum brightness of AM Her at about $B = 15^m.3$. In this state the amplitude of the occultation light curve is very small.

The high and active state of AM Her is closely combined with the increase of brightness caused by X-ray heating. In such phases the star can keep a maximum brightness of approximately $B \approx 13^m.0$ with variations of about 0.5 mag on the average (Hudec, Meinunger). In the given long time light curve the high state is characterized by a broad band of observations between $B \approx 13^m.5$ and $B \approx 14^m.4$ beginning at 1982 May 13 after the low state. Also remarkable is the well pronounced decline from the high to the low state.

In order to study the influences of occultation light changes to the overall light curve, in particular at the high state, all observations, were reduced by means of the orbital elements

$$\text{min.}_{\text{hel.}} = 244\,5180.440 + 0.^d.12892774 \cdot E$$

to one common epoch.

The result is given in Figure 2 where the magnitudes m_B are plotted against the phases. The activity of the orbital period, given by Szkody, Raymond and Capps (1982), can be confirmed evidently at the high state. The mean occultation light curve in B (marked by circles) is in conformity with that given by Szkody (1978). In the low state, however, no periodical variation can be seen in our observations because of their small amplitude and of the long exposure times of the plates used.

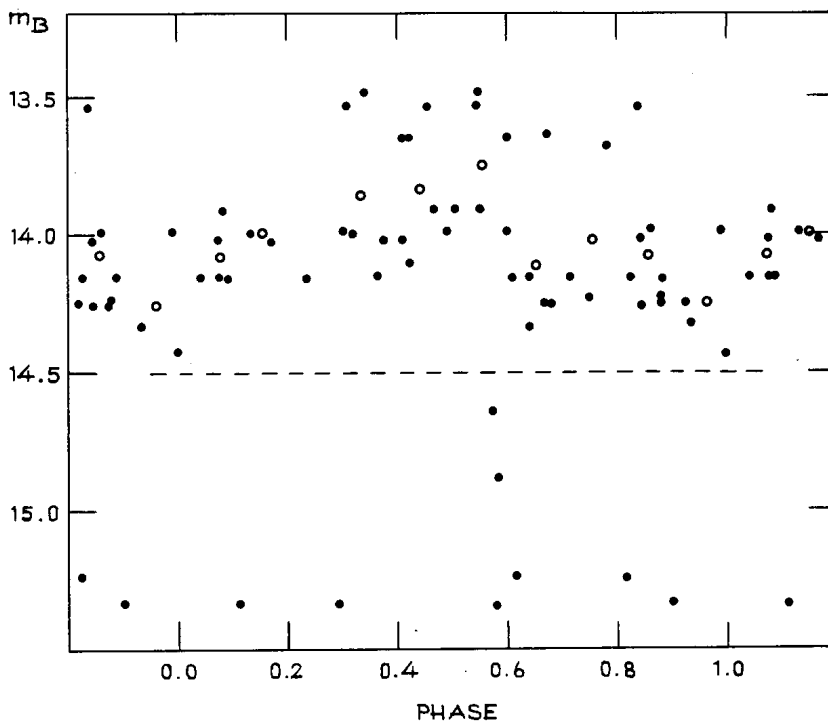


Figure 2

More details about the behaviour of AM Her in the past year will be published in MVS. We thank Mr. Boller, guest student at our observatory, for taking a series of plates at the Schmidt camera.

W. GÖTZ

Akademie der Wissenschaften
der DDR Zentralinstitut für
Astrophysik, Sternwarte
Sonneberg

References:

- Hudec, R., Meinunger, L., 1977, MVS 7, 194
Magalhaes, A.M., 1982, IAU-Circ. No. 3698
Mattei, J.A., 1982 IAU-Circ. No. 3689
Patterson, J., Price, C., 1980, PASP 93, 71
Szkody, P., 1978, PASP 90, 61
Szkody, P., Raymond, J.C., Capps, R.W., 1982, Ap.J. 257, 686
Verdenet, M., 1982, IAU-Circ. No. 3693