

CCD OBSERVATIONS OF THE POLAR AM HERCULIS

S.Yu. Shugarov¹, N.I. Ostrova²

¹ Sternberg State Astronomical Institute, Moscow State University, Moscow 119899 Russia

² Department of Astronomy, Odessa National University

T.G.Shevchenko Park, Odessa 65014 Ukraine, *astro@paco.odessa.ua*

ABSTRACT. Results of two CCD runs of V observations of AM Her obtained on August 1 and 2, 1998 are reported. The moment of minimum brightness at HJD 2451027.4014 \pm 0.^d0012 is in a good agreement with an ephemeris by Andronov et al. (2001).

Key words: Stars: binary: cataclysmic; stars: individual: AM Her

AM Her was observed at the 38cm telescope of the Crimean Astrophysical Observatory equipped with a CCD camera ST-7 in the V filter with the exposure varying from 60 to 90 sec. These runs were obtained on August 1 (HJD 2451027.3369 – .4234) and 2 (HJD 2451028.3423 – .3914), 1998 as a part of the campaign of the observations simultaneous with that obtained at the 6m telescope of the Russian Academy of Sciences by N.N.Somov and T.A.Somova.

The star was in its intermediate state, varying in the range Δm from 0.^m76 to 2.^m04 during the first run and 0.^m68 – 1.^m19 during the second run. The amplitude in the second interval is underestimated, as the observations cover only 0.4 of the cycle, being close to the maximum of brightness. The comparison star is "d" (Liller, 1977) with $V = 13.^m10$.

We have used the recent ephemeris

$$Min.HJD = 2446637.0510(6) + 0.12892711(3)E \quad (1)$$

(Andronov et al., 2001), which was based on 267 timings. The latest review on AM Her may be found in this volume (Andronov, 2001). The extensive multi-wavelength photometric and polarimetric study of AM Her is presented by Shakhovskoy et al. (2001).

The light curve is shown in Fig. 1. To avoid systematic differences of the fits owed to various methods, we have used the method of "Running parabolae" with a filter half-width $\Delta t = 0.^d035$ adopted in previous studies (Shakhovskoy et al., 2001).

The broad minimum was observed at HJD 2451027.4014 \pm 0.^d0012 $\Delta m = 2.^m043 \pm 0.^m014$ at the phase -0.035 ± 0.009 , i.e. in an excellent agreement with the ephemeris. At the second night, the secondary minimum occurred at HJD 2451028.3708 \pm 0.^d0044 ($\Delta m = 0.^m965 \pm 0.^m026$) at the phase 0.485 ± 0.034

close to 0.5. However, during the first run, at the same phase the *maximum* is observed, which is followed by an interesting narrow minimum at HJD 2451027.353 at the phase 0.59. If interpreting both secondary minima as eclipses of the column of the same nature, the phase difference of $0.1P$ corresponds to the angle difference of $\sim 36^\circ$. Such drastic changes of the structure and position of the accretion column may be owed to the instability of the trajectory of the flow, rather than to the years-scale variations of the orientation of the magnetic axis of the white dwarf.

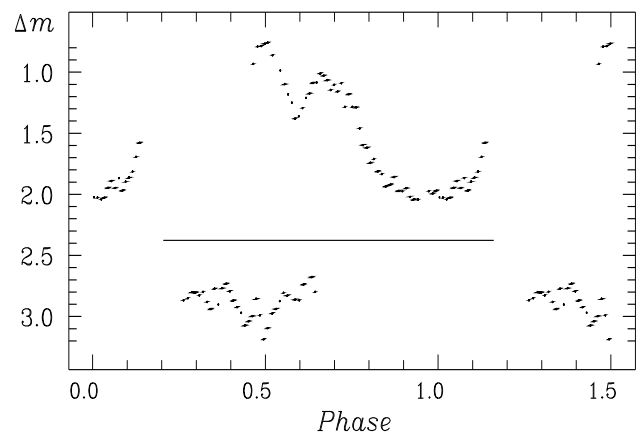


Figure 1: Light curves of AM Her on August 1 (up) and 2 (bottom), 1998. The bottom curve is shifted by 2^m to avoid overlapping.

Acknowledgements. The authors are thankful to I.L.Andronov and V.P.Goranskij for their programs for time series analysis and CCD reduction, respectively.

References

- Andronov I.L.: 2001, *Odessa Astron. Publ.*, **14**, ??.
- Andronov I.L., Kolesnikov S.V., Shakhovskoy N.M.: 2001, *A.S.P. Conf. Ser.* (in press).
- Liller W.: 1997, *Sky Tel.*, **53**, N 5, 351.
- Shakhovskoy N.M., Andronov I.L., Kolesnikov S.V.: 2001, "Atlas and catalogue of the polarimetric and photometric characteristics of the magnetic cataclysmic variable star AM Her", Odessa, Astroprint, 240pp. (in preparation).