

MR SER: PHOTOMETRIC PORTRAIT OF UNUSUAL POLAR

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ABSTRACT. Based on the CCD photometry (R) of MR Ser obtained in 1999-2001, the period was corrected with a corresponding ephemeris $\text{Min.HJD} = 2451369.9664 + 0.0787966E$. The phase curve exhibits drastic changes with luminosity.

Key words: Stars: variable: cataclysmic: polar: MR Ser

We present a result of 3-year detailed photometric investigations of the polar MR Ser. Totally 1773 brightness estimates have been obtained during 24 nights. Based on these data, we corrected its photometric period, as listed in the abstract, with the initial epoch corresponding to the season 1999. The data from 1999, 2000 and 2001 folded with this period are shown in Fig. 1. Over 3 year MR Ser displayed light variations up to $2^{\text{m}}5$ in maximum and up to $1^{\text{m}}5$ in minimum.

The mean profile for 1999 shows a sharp minimum and wide maximum with two "shoulders", where the right shoulder is higher than the left one. Amplitude of this profile is $1^{\text{m}}7$. In 2000 the amplitude decreased up by 1^{m} , the left "shoulder" practically disappeared. The system became brighter. One may note a significant shift of the phase by $\sim 0.1P$, which may be possibly explained by the orientation changes of the magnetic axis of the white dwarf in respect to the rotating line of centers. In the first part of 2001 (2001a) the star was in its lowest brightness state and displayed one-humped profile with an amplitude of $0^{\text{m}}5$.

In 20 days, it has shown a dramatical change: being unchanged in minimum, it jumped by $\sim 1^{\text{m}}$. At maximum, it approached the brightness maximum in 1999. However the shape of maximum now is different: the left "shoulder" is higher than the right one. The largest instability occurs at the phase ~ 0.7 , and the curve is most stable at the phase ~ 0.4 . All these changes may be explained by variations of the structure and orientation of the accretion column.

Table. Journal of observations.

year	days	N	t_{min}	t_{max}
1999	12	1301	51364.4280	51375.5071
2000	6	330	51665.3759	51748.4307
2001(a)	3	80	52083.4017	52100.4622
2001(b)	3	62	52124.3082	52128.2935

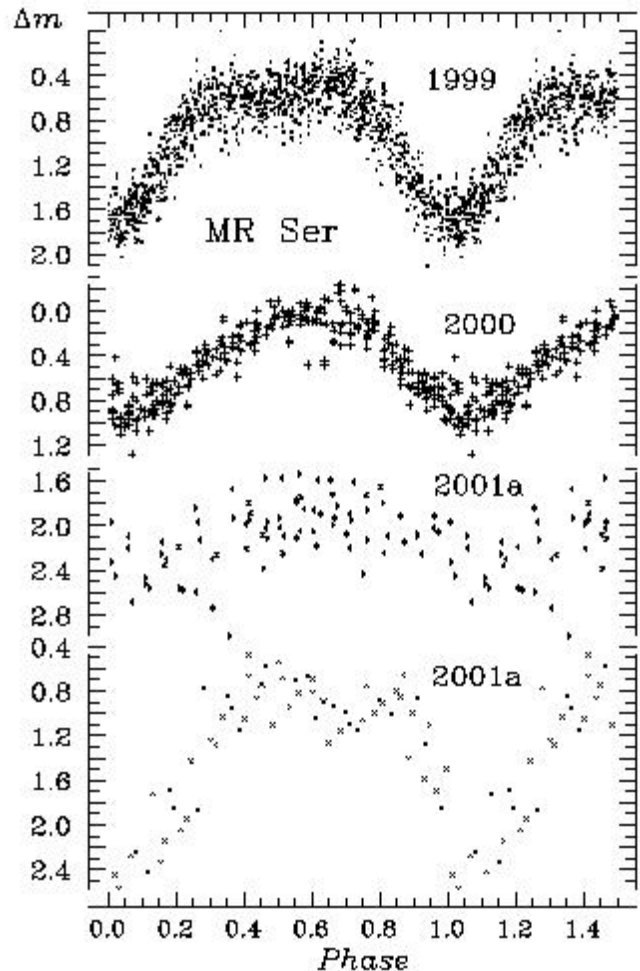


Figure 1: Phase light curves of MR Ser in different seasons