

STUDY OF THE VARIABILITY OF SOME GALACTIC B[E] STARS

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ABSTRACT. The photometric investigation of B[e]-stars MWC 84, MWC 342, MWC 623, and MWC 930, close to them on spectral characteristics, has been made. A brightness variability in the optical and near IR regions has been studied. Regular parts of the variability were detected for all the objects. The variability mechanisms are considered. Binarity evidences for MWC 84, MWC 342, and MWC 930 are presented. A comparison of objects spectral energy distribution (SED) with star models having circumstellar shells was carried out and main system parameters have been defined.

Key words: Stars: emission-line, circumstellar matter, photometric variability, binaries.

The research program on strong emission-line objects with IR-excesses has been carried out jointly by the Central Astronomical Observatory of RAS and the Astrophysical Institute of Kazakhstan AS since 1984. Our results for B[e]-s MWC 84, MWC 342, MWC 623, and the related object MWC 930 are reported here. Photometric UBVR_IJHK observations were made with the 1-m telescope of the Astrophysical Institute (Assy) using the photometer - polarimeter FP3U (Bergner et al. 1988) between 1988 and 1992. It was obtained about 60 observations of MWC 84, about 40 of MWC 623, about 100 of MWC 342, and 12 of MWC 930. Our colleagues from the Astronomical Institute of Uzbekistan AS obtained for us 90 UBVR observations of MWC 930 and nearly 200 of MWC 342 with 60-cm telescope at Mt.Majdanak during 1989-1990. Polarimetric RI and photometric observations were carried out quasisimultaneously with FP3U.

About 50 ones for MWC 342 and not more than 20 for each of other objects were made. V.A.Lipovetsky acquired the spectra of MWC 84, MWC 342, and MWC 623 in 1986-1988, and the author obtained the spectra of MWC 930 and MWC 342 in 1989-1991 in the range of 4000-7000 Å using the scanner of the 6-m telescope of RAS. The dispersion was 50 and 100 Å/mm. Absorption features in the spectra of MWC 84, MWC 623, and MWC 930 are typical for late-type stars, while in MWC 342 they are of early-type. Photometric observations have shown that all the objects have brightness variability. Majdanak observations show that MWC 930 variability includes a regular part with 58.4 d period and amplitudes of about 0.1^m in VR-bands, and 0.4^m in B. For MWC 84 it was found the regular changes with 11.7 d period and the amplitude of 0.3^m. MWC 342 shows smooth brightness changes with 132 d period and the strongest amplitude of 0.6^m in U. Its polarization changes between 0.2 and 5% in the R-band with the period of 66 days. Photometric period of 5.1 d and the amplitude of 0.2^m was detected for MWC 623 in UB_V. Three of our objects signatures of both hot and cool star in their spectra. We have estimated main parameters of the stars and their shells comparing observed and theoretical SED by the method described by Bergner et al. (1990). The best fit for the SED of MWC 84 is B0 V + G8 II plus a dense gas and dust shell. Almost the same result we have obtained for MWC 930 (B0 V + K0 Iab-Ib). We suppose that MWC 342 is also a binary system with a hot (B0) primary and a compact secondary. The X-ray source 4U 2019+39 is situated in 19' of MWC 342 in UHURU error-

box. The best fit for the SED of MWC 623: B2 V+K7 III, $A_v=1.4^m$, and the optically thin dust shell. The nature of its photometric variability remains unknown. Additional observations with more high spectral resolution and more wide spectral range are needed to obtain more refined models.

References

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GEOMETRICAL SCALE OF THE R CORONAE BOREALIS TYPE VARIABLES

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ABSTRACT. The radii of R CrB and RY Sgr are obtained on published radial velocity measurements: 90 radii of the Sun. They are not differed from the Feast' data. The distance of permanent dust shell unconnected with visual

minima is estimated: 100 radii of star. A dust connected with visual minima is formed at the distance of about 60 radii of star.

Key words: Stars: R CrB: diameters – circumstellar dust.