RECENT RESULTS TO BETA LYRAE'S NATURE ON THE BASE OF OBSERVATIONS WITH CCD-DETECTOR

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ABSTRACT. The main results of the investigation of composed spectrum of massive interacting binary β Lyrae are reported. They are based on the study of dynamical and energetical parameters of the emission - absorbtion lines Si II 6347, 6371, Hα, He I 6678, 7065. The high resolution and S/N ratio red spectrogramms of β Lyrae system in general are obtained in 1990-1992 with CCD camera, incorporated into 2.6 m telescope of Crimea Astrophysical observatory.

Key words: Stars: Binary; Stars: Mass transfer

First of all, we revealed first confidently in the silicon doublet the absorption lines of the massive faint component (gainer) that reflecting her the orbital motion (Skulskyj & Topilskaya 1991; Skulskyj 1992). Orbital elements of both components ware calculated for the date 1990-1992. The obtained mass ratio q=4.5 can be considered as final one, the mass of the bright losing component (loser) is 3.0 and the gainer is 13.4 solar masses (Skulskyj 1993c). These data characterize the modern evolutionary status of interacting binary system β Lyrae.

In the second place, the creation of the equipment (Stokesmeter + CCD-detector, Plachinda et al., 1993) allowed us to start (Skulskyj and Plachinda, 1993) the detailed study of β Lyrae magnetic field by odservations of single lines Si II 6347, 6371 in 1991-1992 (the discovery of magnetic of losing component (Skulskyj 1985) has jet not analogy and demands serious reserch). The main result are: the independence confirmation of the fact of presence magnetic field on surface of loser; the confirmation of synchronism of axial rotation loser's with orbital period; the detection of decreasing of magnetic field intensity in internal layers of loser's atmosphere and the elucidation of influence of magnetic field on the formation near the loser's surface her magnitosphere; the revelation of magnetic field at the gainer, that susposses the existence of magnetic interaction between components of β Lyrae system.

Further, we reaveled new factors which affect the profiles and dynamics of aforenamed lines. In particular, of Doppler shifts of center of their emissijon correlate with loser's effective magnetic field variations (Skulskyj & Malkov 1992; Skulskyj 1993b). The variability of equivalent widths of Si II emissions with phase as well as those of the loser's absorptions lines reflects the structure of loser's magnetic field (Skulskyj 1993bc) (the changes of absolute flux in $H\alpha$ emission also are synchronous with the loser's effective magnetic field variations (Burnashev V.I. & Skulskyj M.Yu. 1991). Therefore, the magnetic field on loser's surface markendly effects on the process of matter in β Lyrae system, forming the magnetosphere around of the loser. We revealed that a zone near the loser's magnetic pole which is semiturned to massive gainer is especially important (Skulskyj & Malkov 1992; Skulskyj 1993b). Following along the power lines in outer parts of loser's magnitosphere the gas hits into gravitational zone of the gainer and creates a radial system of streams enveloping gainer. This stream system forms also around the gainer a disc-shaped structure (i.e. satellite-disc). We revealed a shift of local eclipse of the aforenamed zone loser's magnetic field (i.e. the region of the major emission for-

mation) by the satelite-disc surrounding gainer from phase 0.97P in 1991 to the phase 0.93P in 1992 (Skulskyj 1992, 1993c): we derived the valuable conclusion that major axis of this disc is turning and precessing.

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A SEARCH FOR POSSIBLE UNRESOLVED COMPONENTS IN EIGHTEEN ECLIPSING BINARIES

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ABSTRACT. A total of 8507 minima times (6890 visual and 1617 photographic or photoelectric ones) of 18 eclipsing binary stars have been separated and collected from the remarkable collection of late Dieter Lichtenknecker and from the recent literature. Using the Kopal method for the analysis of the obtained (O–C) diagrams of these systems (belonging to different types of eclipsing variables) one can classify them into three categories:

1. "good cases": systems with light–time effect resulting third component with reasonable orbital and astrophysical parameters. They are AB And, TV Cas, XX Cep, AK Her.

2. "probable cases": good candidates of multiplicity but the observational data available up to now are insufficient for obtaining satisfactory description. Light–time analysis of these systems has resulted not so good solutions like for the previous group, but they can be held as noticeable targets for the future studies. These systems are U CrB, W Del, U Peg, AT Peg, ST Per.

3. "problematical cases": These systems either do not have enough data for making unambiguous identification of the sinusoidal (O–C) (due to light–time effect) and thus, we could not find a corresponding good third–body orbit, or the mathematical analysis led to results which are inconsistent with other observational or astrophysical facts. They are RT And, XZ And, OO Aql, Y Cam, RS CVn, TW Cas, CQ Cep, MR Cyg, SW Lac.

Key words: Stars: Binaries: eclipsing – period changes – light–time effect