

Two new SB2 systems among the Am binaries studied at Rozhen NAO

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Abstract. The secondary components of two new SB2 systems were detected at Rozhen NAO as a result of long term program for investigations of Am binaries.

Key words: spectroscopic binaries; metallic-line stars

Две нови SB2 системи сред Ам двойните звезди изучавани в НАО-Рожен

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В НАО - Рожен са открити вторичните компоненти на две нови SB2 системи като резултат от дълговременна програма за изследване на Ам двойни звезди.

Introduction

CCD-observations of many unresolved SB1 systems reveal their binary nature. Since more of the Am stars were confirmed as binaries in the last decade, the importance of investigation the role of duplicity in driving peculiarity in metallic line stars becomes crucial. Such findings lead again to the "tidal mixing + stabilization" hypothesis (Budaj [1997]) and give an opportunity for a search for possible abundance anomalies driven by tidal interaction and an adequate explanation of Am phenomenon. Thus, new Am binary stars were added for the extended study our group started on the subject before (Budaj & Iliev [2003]; Iliev et al. [2006]).

1 Observations, Data Reduction

The observations were carried out with the 2-m RCC telescope of the Bulgarian National Astronomical Observatory Rozhen during the period 2003–2006. The Photometrics AT200 camera with a SITe S1003AB chip (1024×1024 , $24\mu\text{m}$ pixels) was used in the Coudé spectrograph in order to obtain spectra in 100 \AA wide spectral regions centered at 6440 \AA and 6507 \AA with a resolving power $R = 32000$. The typical S/N ratio reached was about 300. Standard IRAF procedures were used for bias subtraction, flat-field division and wavelength calibration.

2 The Observables

Sample stars list was extracted as specific criteria were applied: stars must be brighter than 7th magnitude in V filter and with declination $< -10^\circ$. In order to have full range of eccentricities and to avoid MS targets with circularized orbits, only stars with orbital periods $10^{\text{d}}0 < P_{\text{orb}} < 180^{\text{d}}0$ were considered.

Thus, the number of Am stars suitable for full investigation of orbits and chemical abundances at NAO–Rozhen was reduced to 27.

HD 17581 is a SB1 system in SB9 catalogue. Only one CCD–spectrum of it has been found in Elodie (OHP) archive. We have very good resolution of the secondary and keep collecting more spectra for its detailed study (see Fig.2).

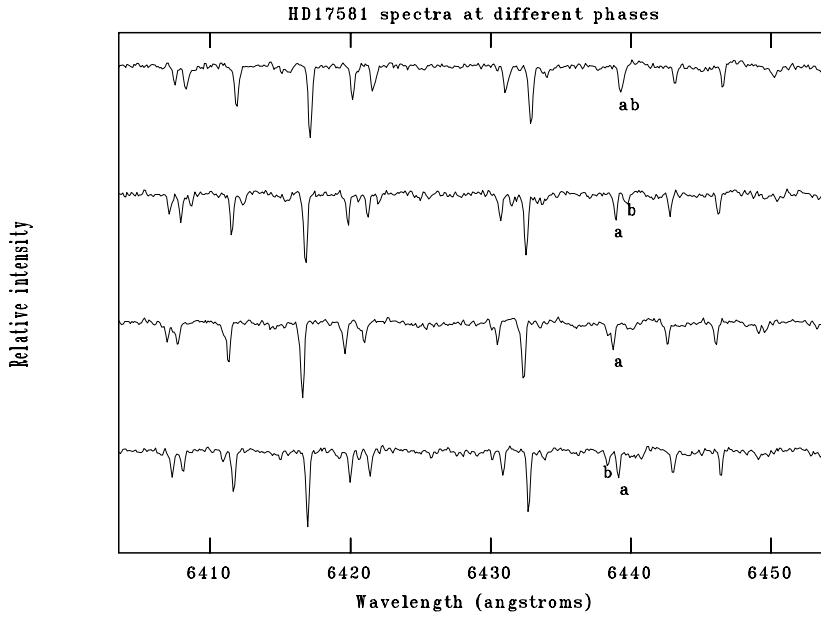


Fig. 1. HD 17581– three spectra were shifted in relative intensity and show the movement of the components. "a" denotes the primary, "b" denotes the secondary.

HD 20210 (see Fig.2) is reported as a SB1 system in SB9 catalogue too. Elodie (OHP) archive extracts ten spectra and a good radial-velocity curve. Its SB2 nature is not published yet. Our Coudé spectra have better quality. Our S/N ratio is about three times better than ELODIE's. We continue observing it for future chemical abundance analysis and better orbital solution.

Conclusion

This brief report shows the need of high-quality spectroscopic data for Am binaries in order to understand metallic-line phenomenon. CCD–observations in the Coudé focus of 2–m RCC telescope give a great advantage in this peculiar subject.

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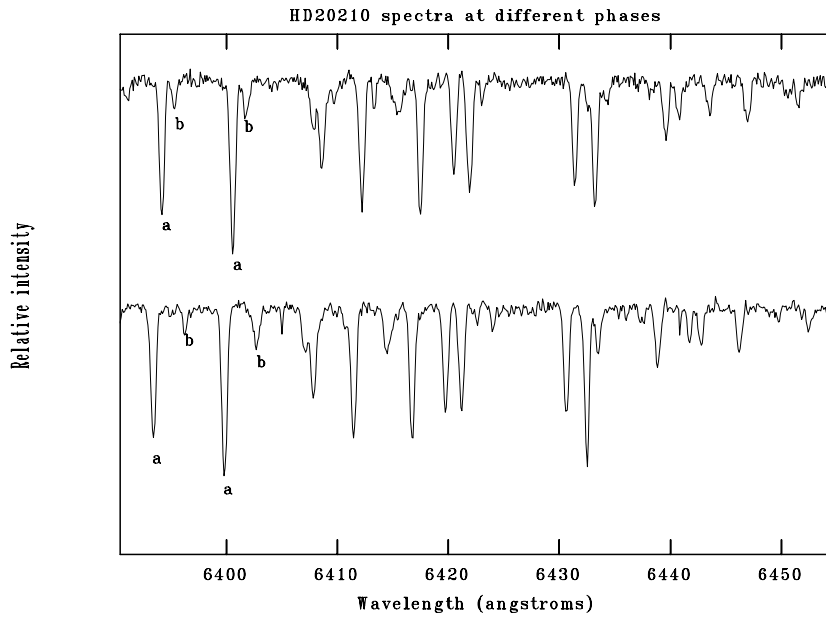


Fig. 2. HD 20210– two spectra reveal the binary nature of this Am star. Again "a" denotes the primary, "b" denotes the secondary.

References

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