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The Line Profile Variations of 60 Cyg (HD 200310)*

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Abstract. Results of the preliminary investigation of the monitoring of line-profile variations of the Be star 60 Cyg are reported. At least three apparent absorption or emission bumps moving from blue to red were detected.

1. Introduction

60 Cygni (HD200310, V1931 Cyg) is a variable Be star (sp. type B1 Ve, v sin i = 300 km/s). Variable radial velocity was reported by various authors. Harmanec et al. (1986) from the coincidence of photometric and spectroscopic periods concluded that 60 Cyg might be a SB1 with a period 2.48257 days.

Helium profiles on spectra taken at Ondřejov and OHP have shown variable asymmetries reminiscent of "moving bumps" observed in OB stars . In this paper we present the first detection of moving subfeatures in the HeI 447.1 nm line of 60 Cyg.

2. Variability of the HeI 447.1 line profile

Spectra were obtained in August 1994 with the Aurélie/T152 instrumentation at OHP by D.B. Two helium lines were observed - 447.1 and 667.8 nm. Mean profiles for the particular night were then subtracted from the individual spectra. Results of this subtraction during the night (JD 49570.5) are shown in Fig. 1. Features moving from blue to red through the HeI 447.1 line are identified by numbers: 1, 2, 3 and 4. It was not possible to construct similar figure for series covering the HeI 667.8 line. The reason might be instrumental (lower S/N ratio) and/or it might reflect the influence of the Be star envelope. The "moving bumps" were measured for radial velocity (displacement from the centre of HeI 447.1 line). The bump crossing rate is about 80 km/s/hr (in both nights where 447.1 line was observed. This is in good agreement with other stars (c.f., e.g., θ CrB - Hubert et al. 1990 or η Cen - Leister et al. 1994).

[1†]Jiři Horn died December 13, 1994

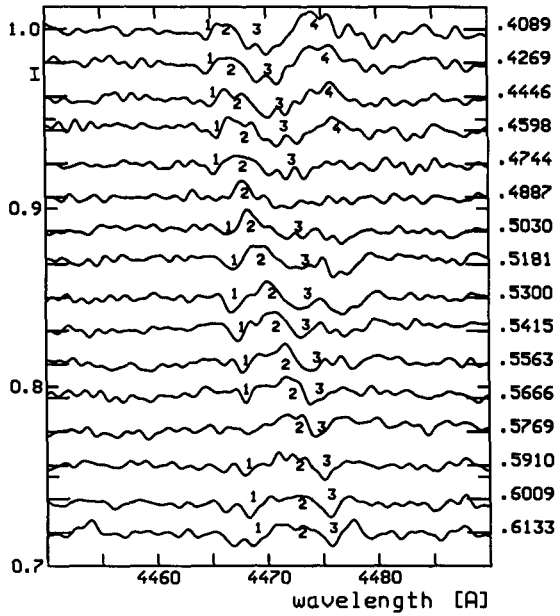

Figure 1. Residuals formed by subtracting the mean night (JD 49570) profile from the individual profiles. Prominent features are identified by numbers. Profiles are labelled by fraction of Julian date.

3. Conclusions

High resolution, high S/N spectra of the Be star 60 Cyg revealed the presence of features moving from blue to red across the HeI 447.1 profile. Due to the limitation of only two short data strings we have not made any attempt to explain these variations.

It should be stressed that 60 Cyg is a very interesting object worth of systematic study. The open questions are:

- character of light variations
- correlation between the short term variation of lines like HeI 447.1 and emission components to Hα or HeI 667.8 line.

* Based on observations collected at the Haute Provence Observatory

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