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An abundance analysis of the single-lined spectroscopic binaries with barium stars-like orbital elements*

II. The spectroscopic data

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Abstract. High–resolution spectroscopic observations are presented for 19 single–lined binaries (giants and dwarfs) with orbital elements and mass functions similar to those of barium stars, two radial velocity non–variable barium stars, and two standards. All binary systems contain an unseen low–mass component, presumably, a white dwarf. The equivalent widths and oscillator strengths are given for all measured spectral lines.

Key words: binaries: spectroscopic — stars: chemically peculiar — stars: abundances

1. Introduction

During the years 1993–94 the observation of a large sample of single–lined spectroscopic binaries with barium stars like orbital elements and unseen companions have been carried out. The program stars were selected with the aim to define a sample of binary systems with orbital parameters similar to those of barium stars but for a range of orbital periods, mass function and eccentricity. The purpose of this project is to obtain a well represented abundance pattern for long period binaries to compare these abundances with solar ones and to analyze the influence of the unseen companion on the atmosphere of the primary star to understand better the sufficient conditions for the formation of barium stars. This paper presents the spectroscopic data analyzed in Paper I (Začs et al. 1997).

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* Tables 2 and 3 are only available in electronic form at the CDS via anonymous ftp to cdsarc.u-strasbg.fr (130.79.128.5) or via http://cdsweb.u-strasbg.fr/Abstract.html

Table 1. A journal of observations. The number, identification, visual magnitude, date of each exposure, the telescope, spectrograph, and wavelength range are given

No.	HD	V	Date	Tel.	Spectr.	Sp. range (Å)
1	6582	5.15	2-12-93	1 m	CEGS	4400 – 6900
2	13530	5.31	2-12-93	1 m	CEGS	4400 – 6900
3	21754	4.10	29-11-93	1 m	CEGS	4400 – 6900
4	61421	0.37	20-01-94	1 m	CEGS	4400 – 6900
5	76943	3.97	3-12-93	1 m	CEGS	4400 – 6900
6	113226	2.83	19-05-94	1 m	CEGS	4400 – 6900
7	116594	6.44	26-05-93	6 m	LYNX	5000 – 7200
8	119185	8.89	27-05-94	6 m	LYNX	5000 – 7200
9	120539	4.91	20-05-94	1 m	CEGS	4400 – 6900
10	121370	2.68	19-05-94	1 m	CEGS	4400 – 6900
11	130255	8.86	25-05-94	6 m	LYNX	5000 – 7200
12	155410	5.08	5-09-93	1 m	CEGS	4400 – 6900
13	160538	6.55	21-08-94	6 m	LYNX	5000 – 7200
14	166478	7.97	22-05-93	6 m	LYNX	5000 – 7200
15	168532	5.27	4-09-93	1 m	CEGS	4400 – 6900
16	170737	8.08	9-08-94	6 m	LYNX	5000 – 7200
17	176155	5.38	6-09-93	1 m	CEGS	4400 – 6900
18	176524	4.82	1-09-93	1 m	CEGS	4400 – 6900
19	179558	7.94	11-08-94	6 m	LYNX	5000 – 7200
20	181602	7.55	11-08-94	6 m	LYNX	5000 – 7200
21	204934	8.7	9-08-94	6 m	LYNX	5000 – 7200

2. Observations

High resolution spectra of the programm stars were obtained with the 6 m and 1 m Telescopes at the Special Astrophysical Observatory (SAO) using the Nasmyth echelle spectrometer LYNX (Panchuk et al. 1993) and coude–echelle spectrometer CEGS (Musaev 1993) equipped with the 580×530 pixels CCD detectors. Table 1 provides a journal of all observations. Apparent magnitudes are from Hoffleit (1982).

3. The spectroscopic data

The reduction and interpretation of the spectra have been explained in detail in Paper I. In the Tables 2 and 3, we give the list of lines used in the abundance analysis, the atomic oscillator strengths (log gf), and measured equivalent widths (in mÅ) for each star. The equivalent widths were measured by interactively fitting single Gaussian functions to the line profiles. The atomic oscillator strengths were taken from Luck & Bond (1985); Thevenin (1989, 1990) and Gurtovenko & Kostik (1989).

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