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The Multiple System SZ Cam

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Abstract. The multiple stellar system SZ Cam is solved using the method of spectral disentrangling. Hα line profiles of three components are obtained and spectroscopic orbit elements are redetermined.

Keywords. Binaries: spectroscopic – stars: individual (SZ Cam)

1. Introduction

The multiple hierarchical system SZ Cam is one of the brightest members of the open cluster NGC 1502 and is the B component of the visual double ADS 2984. It is composed of four stars: an SB2 eclipsing binary, which is physically bound to an SB1 binary pair. The multiple nature of SZ Cam has been studied by many authors (Mayer *et al.* 1994; Lorenz *et al.* 1998; Harries *et al.* 1998; Gorda 2002). We present the results obtained from the spectroscopic analysis of the system.

2. Data

The spectroscopic data we used in the analysis were taken at two different sites:

- 17 new spectra obtained with the 2-m telescope at the Ondřejov Observatory between 2004 and 2006 at the coudé focus (for a description of the spectrograph see Šlechta & Škoda 2002);
- 19 spectra provided by P. Mayer, obtained at Calar Alto Observatory in 1993 and 1995 (Lorenz *et al.* 1998).

3. Analysis

We use the KOREL code (Hadrava 1995, 1997, 2004, 2006) in our analysis. This program is a powerful tool for the decomposition of spectra, as well as for the determination of orbital parameters. For the disentangling the spectra we have chosen the Hα (6564Å) line. The decomposed spectra of three components of SZ Cam, obtained for the Hα line, are shown in the Figure 1. Radial velocities for the primary and secondary components are shown in Figure 2, while for the tertiary, in Figure 3. In Table 1, the orbital parameters of the system obtained using KOREL are given.

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We thank P. Mayer for providing the spectra of SZ Cam. We are grateful to P. Hadrava

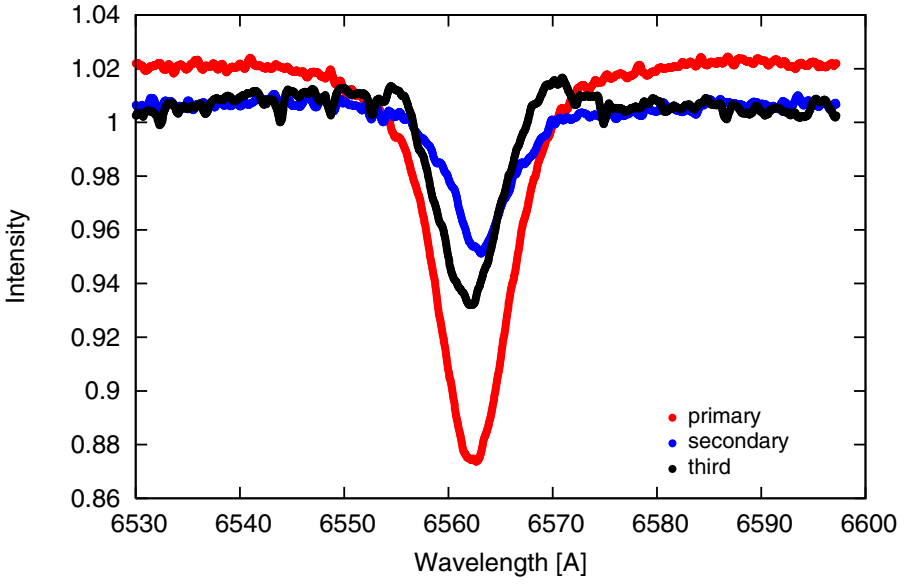

Figure 1. Decomposed Hα spectrum of SZ Cam for the primary (red), secondary (blue), and tertiary (black) components.

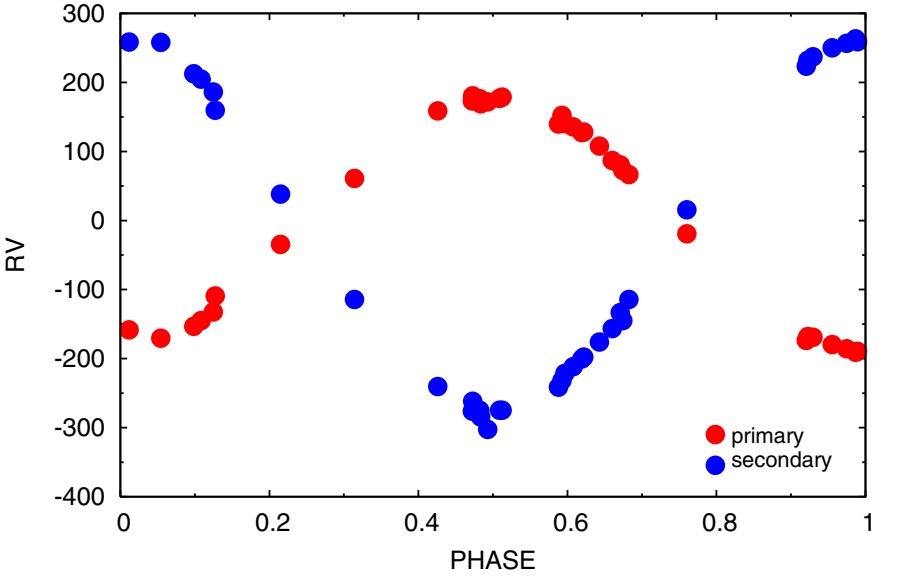

Figure 2. Radial velocities of the primary and secondary components of SZ Cam obtained with the KOREL code after disentangling the spectra.

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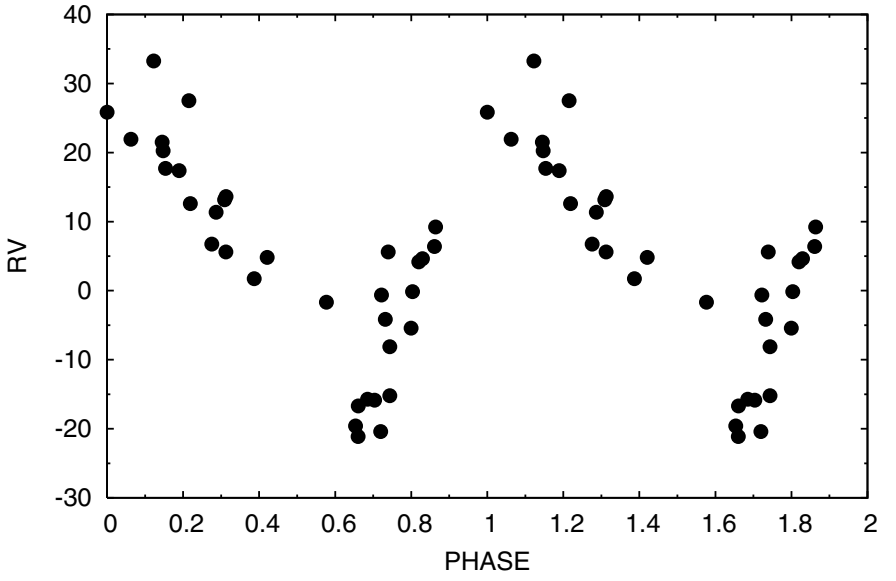

Figure 3. Radial velocity of the SB1 tertiary component of SZ Cam.

Table 1. Orbital parameters of SZ Cam.

eclipsing pair	
P [d]	2.698401
T_0	48933.02658
K_1 [km/s]	181.591
K_2 [km/s]	268.210
M_2/M_1	0.68
SB1 pair	
P_3 [d]	2.798336
$T_{\rm min}$	51478.669
K_3 [km/s]	19.4
$f(M)$ [$M_\odot$]	0.0021

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