

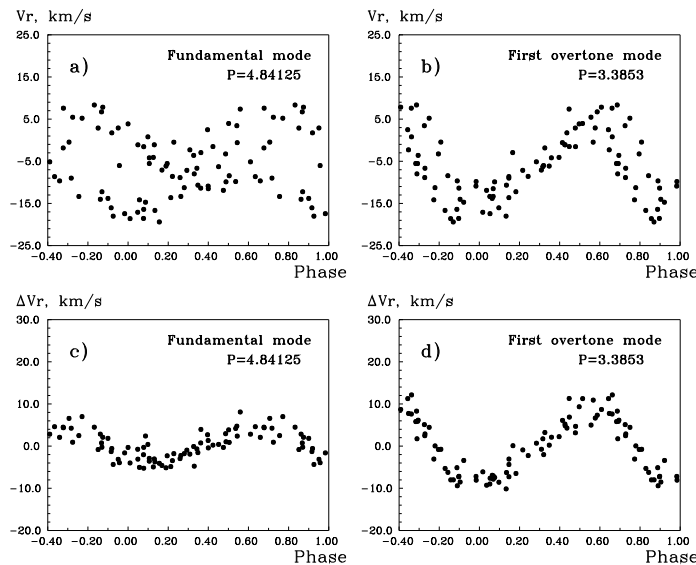
**THE RADIAL VELOCITY OF DOUBLE-MODE CEPHEID BD –10°4669**

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CEP(B)-type variability of BD –10°4669 was recently discovered by Antipin (1997). The star was bright enough to include it in our programme of Cepheid radial velocity measurements, so the new variable became the sixth beat Cepheid in our observations along with CO Aur, TU Cas, EW Sct, V367 Sct, and BQ Ser. In 1997–98 we obtained 70  $V_r$  measurements at the 60-cm and 1-m reflectors of Simeiz Observatory equipped with the correlation spectrometer (Tokovinin, 1987). Table 1 contains HJD, heliocentric  $V_r$  values and their internal r.m.s. errors. The value of gamma-velocity from these observations is  $V_\gamma = -5.6 \pm 0.4$  km/s.



**Figure 1.** The phased radial-velocity variations. See description in text

In Figure 1 we present phased  $V_r$  curves for the elements taken from Antipin (1997):

$$\begin{aligned} \text{JD}_{\max} &= 2447733.42 + 4^{\text{d}}.84125 \times E \quad (\text{fundamental mode Fig. 1ac}) \text{ and} \\ \text{JD}_{\max} &= 2441177.37 + 3^{\text{d}}.3853 \times E \quad (\text{first overtone mode Fig. 1bd}). \end{aligned}$$

Figures 1ab are based on original measurements. Figures 1cd are constructed for deviations from the mean phased curve of the other oscillation (from the first overtone for

Table 1: Radial velocities of BD  $-10^{\circ}4669$ 

HJD 24. . .	$V_r$ , km/s	$\sigma$	HJD 24. . .	$V_r$ , km/s	$\sigma$	HJD 24. . .	$V_r$ , km/s	$\sigma$
50614.441	0.8	0.7	50732.202	-1.5	0.5	51020.391	2.9	0.9
50617.468	5.5	0.4	50976.417	6.7	0.7	51021.383	-19.4	0.7
50621.430	3.4	0.5	50977.433	-16.4	0.8	51022.384	-2.9	1.1
50623.439	-6.0	0.6	50981.416	-13.8	0.5	51023.335	7.4	0.6
50625.398	-11.4	0.6	50982.413	-4.2	0.6	51024.363	5.2	0.8
50634.434	-0.5	0.9	50983.388	-2.3	0.7	51025.388	-17.4	1.0
50636.397	-8.6	0.7	50987.389	-16.7	0.6	51026.387	-6.1	0.9
50640.352	-6.3	0.6	50988.427	-10.7	0.6	51027.386	2.5	0.8
50642.344	-14.0	1.6	50989.372	-0.6	1.3	51039.365	-12.2	0.8
50645.364	-3.3	1.1	50992.400	-7.1	0.5	51040.369	-1.5	0.6
50648.366	-5.5	0.8	50996.423	3.9	0.4	51045.257	-14.7	0.8
50690.238	-13.3	0.6	50998.360	-11.5	0.8	51046.252	-7.1	0.7
50705.224	2.9	0.3	51000.450	8.3	1.2	51047.261	4.0	0.5
50706.222	-14.1	0.6	51002.334	-8.6	0.5	51048.255	-0.4	0.8
50707.222	-13.3	0.5	51006.340	-1.1	0.5	51051.258	-3.6	0.9
50709.228	7.6	0.7	51007.360	-8.9	0.7	51069.273	-17.1	0.6
50713.227	-8.4	0.6	51008.404	-11.9	0.6	51072.230	-9.7	0.5
50714.259	-9.0	0.5	51009.384	-1.8	0.5	51075.238	-11.3	0.6
50715.236	1.7	0.4	51010.338	7.8	1.7	51076.243	-9.9	0.4
50726.257	-5.5	0.6	51011.317	-18.6	0.6	51083.203	-18.0	0.8
50727.243	-10.9	1.6	51015.380	-16.0	0.6	51084.199	-1.1	0.4
50728.264	-5.1	0.9	51016.396	-4.1	0.8	51085.225	-6.6	0.9
50730.201	-18.6	0.4	51017.383	-8.0	1.0			
50731.185	-13.6	0.4	51018.383	-9.8	1.2			

Fig. 1c and from the fundamental mode for Fig. 1d); additionally, the frequency connected with non-linear interaction of the two main modes ( $1/P_0 + 1/P_1$ ,  $P = 1^d9922$ ) has been whitened. The first overtone mode strongly dominates in variations of radial velocity as well as in light variations. The semiamplitudes of  $V_r$  are  $K_0 = 4.3$  km/s and  $K_1 = 9.4$  km/s.

Using the modification of Balona's (1977) method described in Sachkov (1997), we derived the radius of BD  $-10^{\circ}4669$  from the radial-velocity measurements (Table 1) and 164 photoelectric BVI measurements obtained in JD 2450541–51286 by one of the authors (L.N.B.). Two color indices,  $B - V$  and  $V - I$ , were used as indicators of the effective temperature; the results from them are in excellent agreement and with low *formal* errors ( $57 \pm 1 R_{\odot}$  from  $B - V$  and  $58 \pm 1 R_{\odot}$  from  $V - I$ ). The resulting  $\log R$  value is 1.76, in agreement with the value 1.73 predicted from the period–radius relation derived by Sachkov (1997).

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