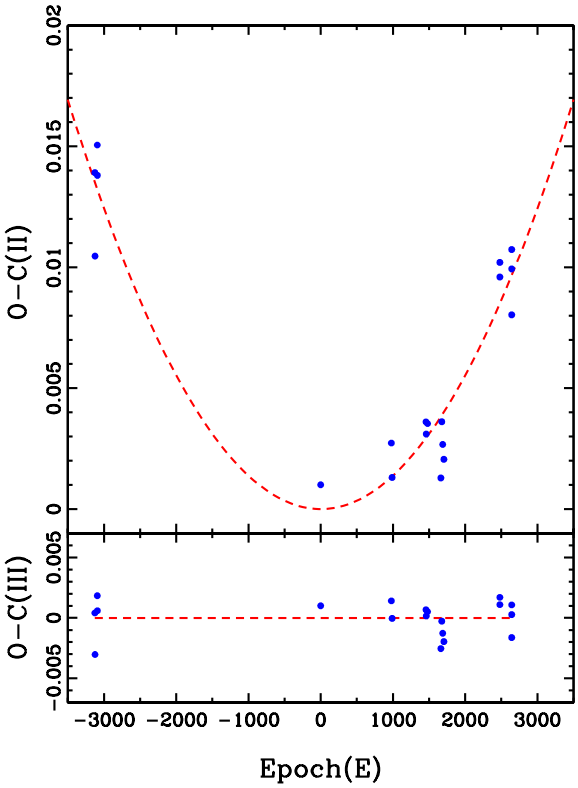

Fig. 3. The O-C(II) residuals plotted versus the epoch number for V1898 Cyg. A least-squares quadratic fit to the residuals is shown by the dashed line (upper panel). In the lower panel the O-C(III) residuals, the deviations from the quadratic fit, are also plotted. The color figure can be viewed online.

tober 26, 2004. The star was observed by DM from July 22, 2003 to September 17, 2004. Only the V-band light curve and observational data of CS were published. However, DM published the B and V light curves. The V light curves obtained in these studies are asymmetric in shape, and they differ from each other. The brightness of the system shows a fast decrease from phase 0.75 up to external contact. However, the increase in brightness following the primary eclipse is no steeper. The distortion of the light curve preceding the primary eclipse is larger in the CS light curve. A remarkable change in the light curve is seen at the phase interval between 0.09 and 0.42. The total brightness of the system in the V-bandpass at this phase interval is greater by about $0^m.03$ in the CS light curve than in DM's. However, CS report that the brightness of their primary comparison star showed light variations during the observations. Moreover the depth of the secondary eclipse is larger by about $0^m.007$ in the light curve of CS than in that of DM. We should note that there is also a slight asymmetry in both the DM's B- and V-passband light curves. This feature is attributed to the transfer of material from the cool secondary to the high temperature primary star which occults a small area of the primary star just before the deeper eclipse.

Acerbi & Barani (2007) analysed the DM's light curves. Since the spectroscopic mass-ratio was not available at that time, they started the analysis by deriving the photometric mass-ratio. Their preliminary analysis indicated that the mass-ratio for the system was about 0.30. Assuming an effective temperature of 20183 K for the primary component and that the secondary, less massive, star fills its corresponding Roche-lobe, i.e. a semi-detached configuration, they arrived at preliminary elements for the system. Their orbital parameters were: $i = 70°$, $r_1 = 0.3196$ and $r_2 = 0.2795$ and $T_2 = 7500$ K. Since the light curves were asymmetric they reported that the agreement between the computed and observed light curves was not very satisfactory: the sum of the squares of the residuals was about 0.814.

In order to analyse the light curves we choose the Wilson-Devinney (W-D) code implemented into the PHOEBE package tool by Prsa & Zwitter (2005). A preliminary analysis indicates that the system is a classical Algol, the secondary component filling its corresponding Roche lobe. Therefore Mode-5 is applied. The WD code is based on Roche geometry which is sensitive to the mass ratio which is taken from RV analysis as 0.192±0.002. Gravity-darkening exponents $g_1 = 1$, $g_2 = 0.32$ and bolometric albedos $\mathrm{Alb}_1 = 1$, $\mathrm{Alb}_2 = 0.5$ were set, i.e. the more massive star has a radiative envelope while the less massive secondary has a convective atmosphere. We used the non-linear square-root limb-darkening and the bolometric limb-darkening coefficients from the tables of Díaz-Cordovés, Claret, & Giménez (1995) and van Hamme (1993).

The orbital inclination (i), effective temperature of the secondary star (T_2), surface potential of the primary (Ω_1), phase shift ($\Delta\phi$), and fractional luminosity of the primary (L_1) were taken as adjustable parameters. The other parameters were fixed. The iterations were carried out automatically until convergence was achieved, and a solution was defined as the set of parameters for which the differential corrections were smaller than the probable errors. The final results obtained by separate analysis of three light curves are listed in Table 3 and the computed light curves are shown as continuous lines in Figure 4. The uncertainties assigned to the adjusted parameters are the internal errors provided directly