

THE 2003.5 POST-PERIASTRON BRIGHTENING OF ETA CARINAE

ALLEN, W. H.¹; VAN GENDEREN, A. M.²; STERKEN, C.³

¹ Alvine Estate, Vintage Lane, RD 3, Blenheim, New Zealand

² Leiden Observatory, Postbus 9513, NL-2300 RA Leiden, The Netherlands

³ Vrije Universiteit Brussel, Pleinlaan 2, B-1050 Brussels, Belgium

After the photometric coverage of the optical light curves at the 2003.5 periastron passage, we continued our *UBV* monitoring of η Car with the same telescope and equipment as described by van Genderen et al. (2003). The spectroscopic event, characterized by the disappearance of high-excitation lines, follows one to two weeks after the periastron passage (JD 245 2808: Steiner & Daminieli 2004). The passage almost coincides with the peak in visual light called the *flare-like event* by van Genderen et al. (2003).

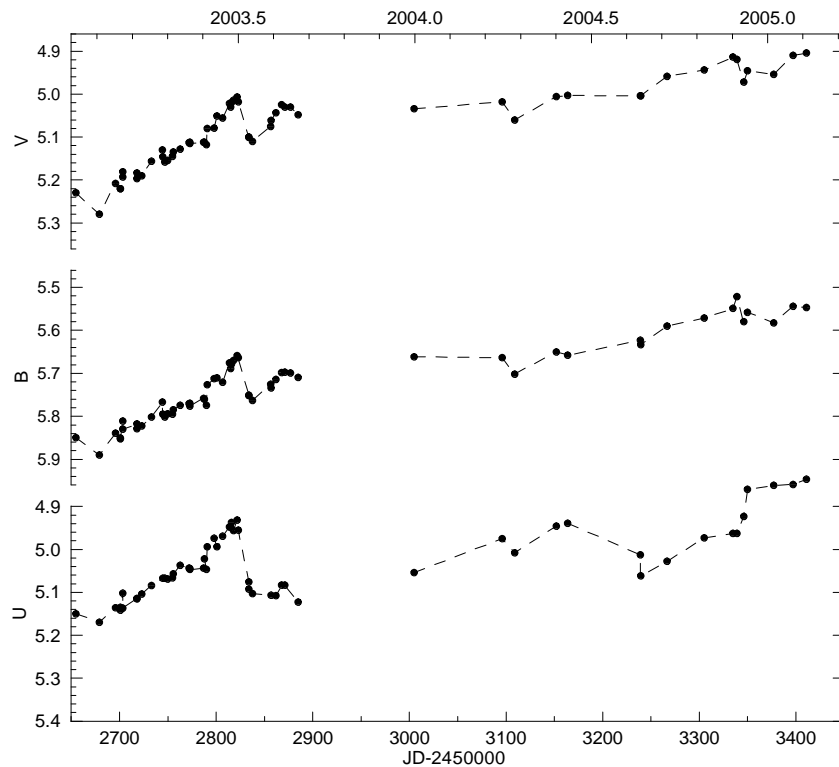


Figure 1. η Car in *UBV*: new data since 2004.0 together with the data by van Genderen et al. (2003).

Figure 1 shows from 2004 onward the new UBV data as a function of Julian date. Mean errors in V , B and U are 0^m02 , 0^m04 and 0^m06 , respectively. As discussed by van Genderen et al. (2003), our $U - B$ scale for η Car is systematically too blue by $\sim 0^m25$, due to filter transmission differences with respect to the standard UBV system and because of incomplete standardisation.

It is evident that after the egress from the eclipse-like dip at JD 245 2840, the brightness in V and B continued to rise – even more so in B than in V . Around JD 245 3340 the brightness reached $V = 4^m9$, the highest level so far, with $B - V = 0^m62$. The U magnitude behaved differently, as usual: after the eclipse-like dip, which is much deeper than in the other bands, there is hardly a recovery to a secondary light peak as observed in V and B . However, during 2004 the U brightness rose as well.

The colour indices (Figure 2) show a most interesting behaviour: $U - B$ declines sharply (in fact a hint of a weak decline appeared already during the maximum of the flare-like event). Part of this sharp decline is presumably due to an UV-deficit reaching us a couple of months after the occurrence of the UV-shadow of the primary (shielding ionizing photons of the approaching secondary, see Smith et al. 2004; van Genderen & Sterken 2005).

After periastron, U shows an oscillation, as seen in our new $U - B$ data of 2004. This oscillation is exclusively present in the Balmer continuum radiation, and its cause is still unclear. In the well-covered cycle 1992–1998, the successive maxima in this flux usually were separated by about 200 d, sometimes 400 d (van Genderen et al. 1999; 2001). So far, the new $U - B$ data presented here are compatible with these time scales.

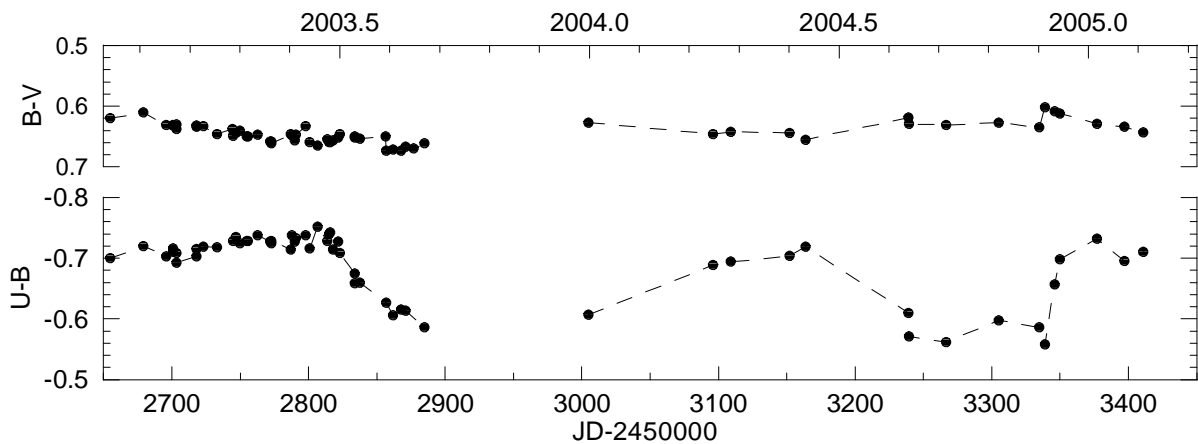


Figure 2. Colour index behaviour of η Car.

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