

THE NEW OVERCONTACT SYSTEM GSC 3273.0761 IN ANDROMEDA AND A STAR SHOWING AN OPTICAL TRANSIENT

Following a variable star search program, the variability of GSC 3273.0761, a 12.6 photovisual (PAL-V1) magnitude star according to Guide Star Catalogue, was found when taking CCD frames of the field of PPM 43860.

In the New Catalogue of Suspected Variable Stars (Kholopov, 1982), NSV 00461 = WR 97, a Cepheid with a photographic variation range between 12.9 and 14.0, is about 4 arcminutes to the west of GSC 3273.0761. However, in the identification chart originally published by Weber (1962), WR 97 can be unambiguously identified with GSC 3276.1206 which is about 1 degree to the north of the position given by Kholopov. Therefore, GSC 3273.0761 and NSV 00461 are different objects. Figure 1, prepared from the Palomar-National Geographic Society Sky Survey, shows the region of GSC 3273.0761. No other catalogued object was found in the position of GSC 3273.0761.

The star was observed for 20 nights, from 17 November 1995 to 23 February 1996 in the V and B bands with the 0.4-m telescope of Monegrillo Observatory (Spain) and a CCD Starlight Xpress camera. GSC 3273.0992 was used as comparison star and GSC 3273.0330 as check star. Figure 2 shows the B, V, and B–V phase curves.

Observations show that GSC 3273.0761 is an overcontact eclipsing binary system. The average amplitude in the V band is of 0^m.45 for minimum I and 0^m.44 for minimum II. The light curve in the V band also shows an O'Connell effect (O'Connell, 1951), that amounts to $\Delta m = \text{Max.I} - \text{Max.II} = -0.037 \pm 0.003$, where Max.I is at phase 0.25 and Max.II at phase 0.75.

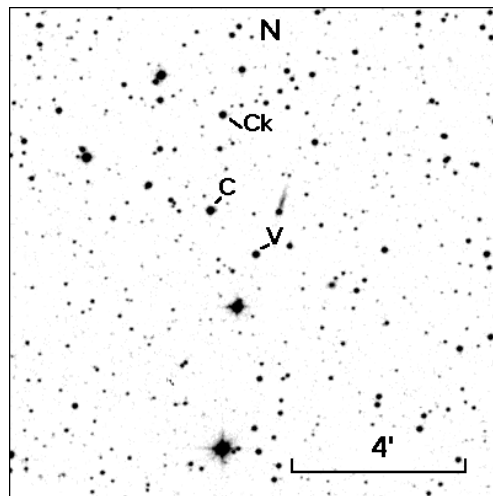


Figure 1. V = GSC 3273.0761, C = Comparison star, Ck = Check star

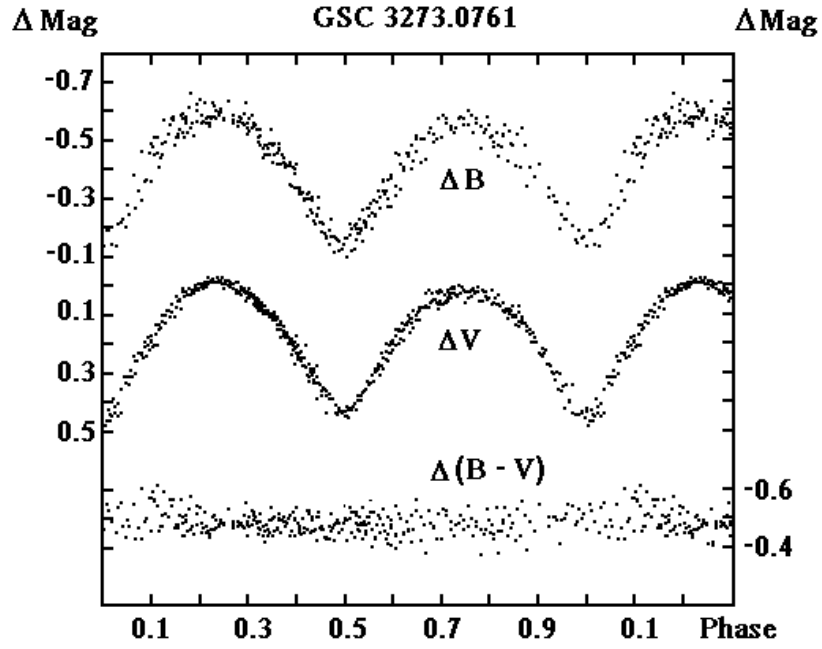


Figure 2. ΔV , ΔB and $\Delta(B - V)$ phase curve of GSC 3273.0761

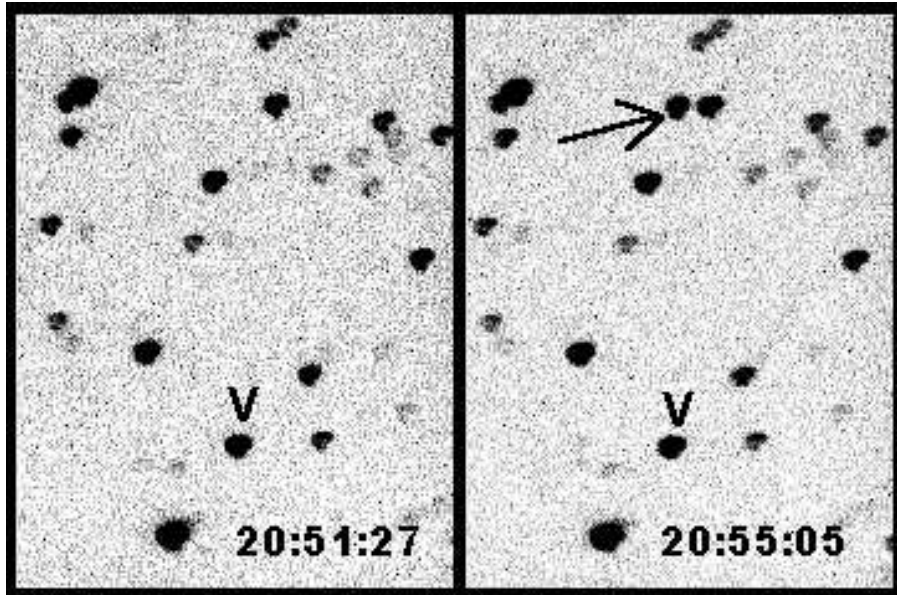


Figure 3. $V = \text{GSC 3273.0761}$ and the transient optical source. North is on top

From the timing of six minima (see Table 1) obtained according to the Kwee–Van Woerden method (1956), the following ephemeris was derived:

$$\text{Min. I} = \text{HJD } 2450053.4277 + 0^{\text{d}}49188 \times E \\ \pm 0.0015 \pm 0.00004$$

Table 1

HJD 2450000+	Minimum	Epoch	O–C	Filter
53.4277	I	0.0	0.0023	V
57.3603	I	8.0	–0.0002	V
69.4096	II	32.5	–0.0019	V
80.4772	I	55.0	–0.0016	V
116.3858	I	128.0	–0.0003	B
130.4065	II	156.5	0.0019	B

In the last CCD frame from the image series obtained on 15 February 1996, a previously unseen starlike object was recorded with an estimated V magnitude of 13. Figure 3 shows the frame which records the object and the frame before (hours are in UT). A thorough examination of the image shows that it is affected by the same telescope driving inaccuracy as the rest of the stars in the same frame, which indicates that it is not an image artifact. During the observation of GSC 3273.0761, about 800 CCD images were recorded but this optical transient does not appear in any other one. A CCD survey to detect the object at minimum light was undertaken. Although the reached limiting magnitude was about 20, nothing was recorded at the position of this optical source whose coordinates are (J2000.0):

$$\text{R.A.} = 01^{\text{h}}18^{\text{m}}52^{\text{s}} \pm 3^{\text{s}} \\ \text{Dec.} = +49^{\circ}43'52'' \pm 10''$$

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