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TWO NEW CONTACT BINARY STARS

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When performing the unfiltered photometric CCD observations of the minor planet (5690) we discovered two new field variable stars in October, 2000. We made follow-up multicolour observations through BVR_C filters of these stars on four nights in December, 2000. In this paper we report the results of these observations. The new variable stars have been named continuing the designation system of Csák et al. (2000b).

The observations were carried out with the 60/90/180 cm Schmidt-telescope of the Piszkéstető Mountain Station of the Konkoly Observatory. The detector was a Photometrics AT200 CCD camera (1536×1024 pixels) giving a $29' \times 18'$ field of view. The reduction of the discovery frames was the same as has been described in Csák et al. (2000a), while in December we made differential photometry relative to selected local comparison stars GSC 3762-0061 and GSC 3762-0231 (Guide CD-ROM Star Chart, 1997). Individual data are avaliable at the IBVS website as files 5049-t3.txt (V31) and 5049-t4.txt (V32).

Due to instrumental difficulties we could not transform the measurements to the standard system, but the light curve shape of the new variables and the lack of colour variations (constant amplitude in every band) suggested that these ones are W UMa type stars. We have got a relatively good phase coverage for both stars so we could do an accurate period search for each stars using the Period98 software (Sperl, 1998). We present the obtained phased light curves in Figs. 1-2. It is notable that both of primary and secondary minima of V32 are total eclipses. It means that the inclination of the eclipsing system should be near to 90 degrees, so – for example – the inclination ambiguity is almost completely exluded from the light curve modelling and stellar mass determination. The basic data of the new variables (celestial coordinates, epochs, periods etc.) are summarized in Table 2. We have collected 13 times of minimum of the stars using low order polynomial fitting for V31 and bisecting chords method for V32. The obtained times of minimum are collected in Table 1.

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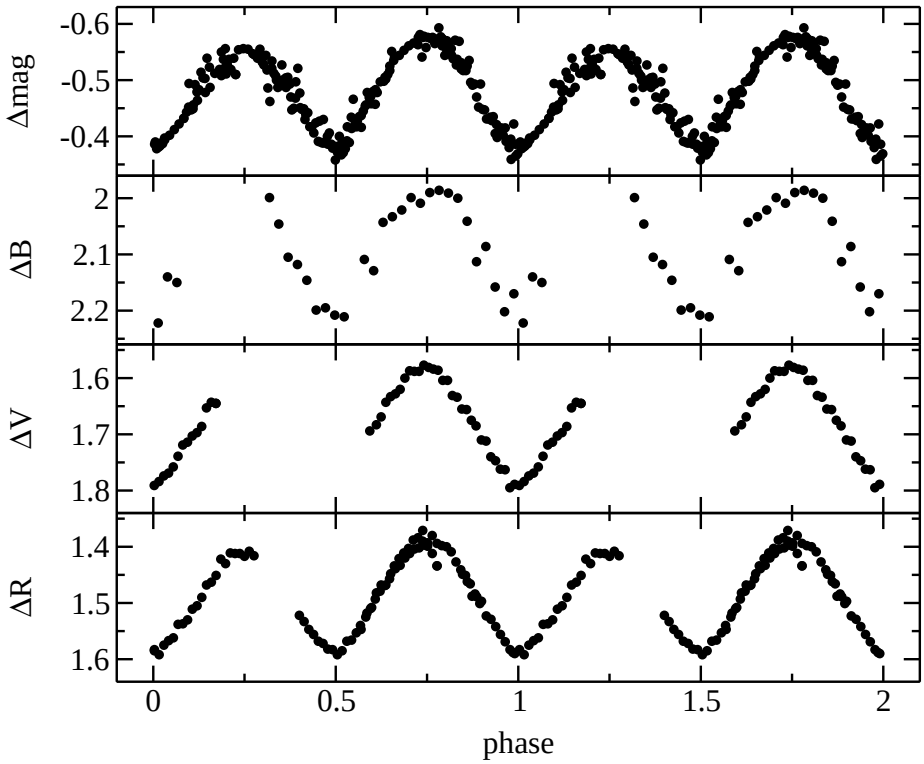

Figure 1. Unfiltered, B, V and R light curves of V31

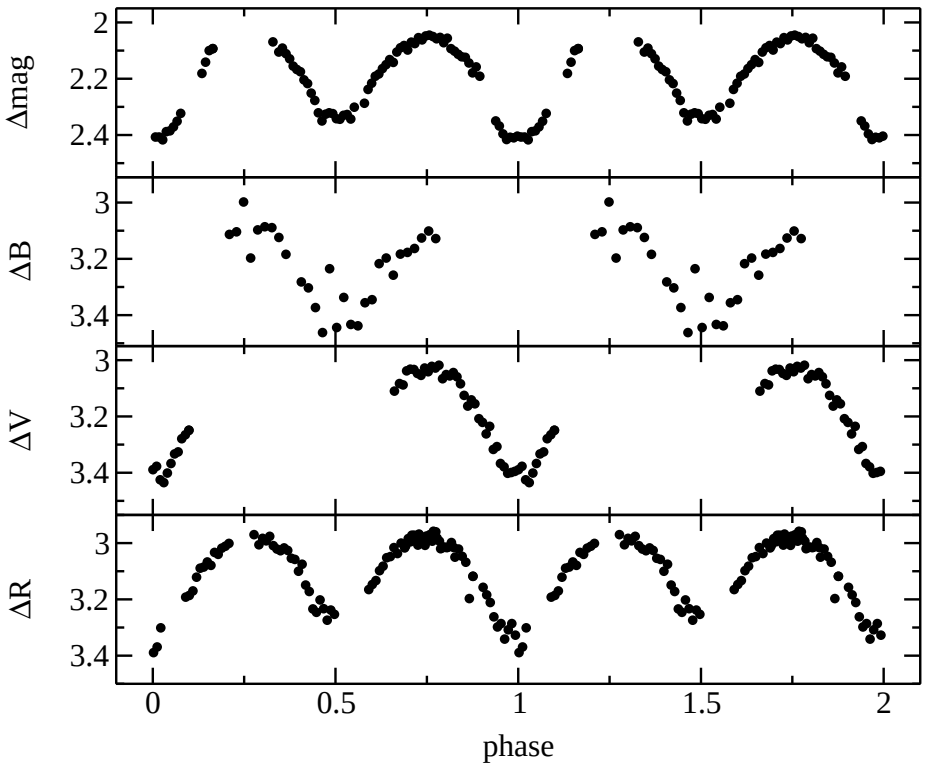

Figure 2. Unfiltered, B, V and R light curves of V32

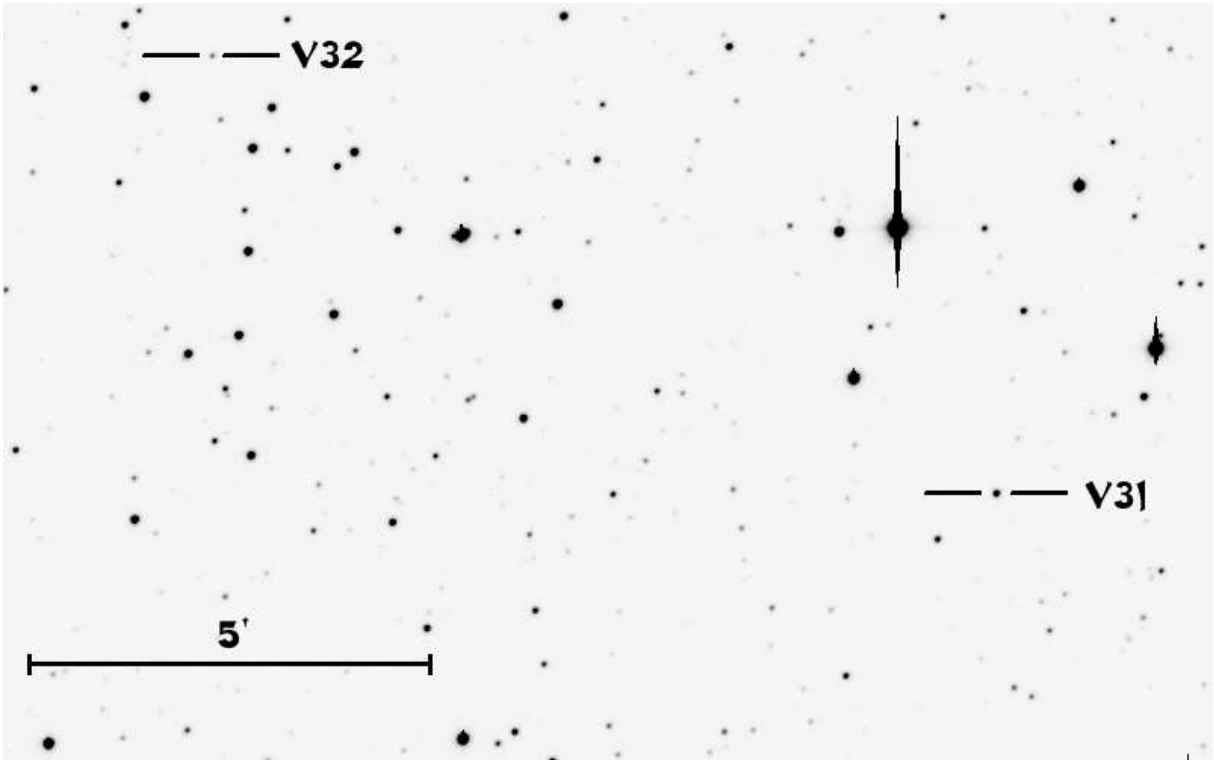

Figure 3. Finder chart for V31 and V32. The center of the frame is $\alpha(2000) = 05^{\rm h}58^{\rm m}50\overset{\rm s}{.}0$, $\delta(2000) = +59^\circ\,48'\,00\overset{''}{.}0$, North is up, East is to the left

Table 1: Times of minimum for V31 and V32

Star	HJD	Type	Star	HJD	Type
V31	2451830.4310	–	V31	2451883.5383	–
V31	2451830.5730	–	V32	2451880.3732	
V31	2451880.3583	–	V32	2451880.5571	
V31	2451880.4936	–	V32	2451881.2853	II
V31	2451881.3242	–	V32	2451881.4668	I
V31	2451881.4662	–	V32	2451883.4788	
V31	2451883.3975	–			

Table 2: Basic data of the new variables. The coordinates were taken from USNO-A1.0

	V31	V32
R.A. (2000)	$05^{\rm h}58^{\rm m}15\overset{\rm s}{.}56$	$05^{\rm h}59^{\rm m}25\overset{\rm s}{.}69$
Dec. (2000)	$+59^\circ46'22\overset{''}{.}46$	$+59^\circ51'23\overset{''}{.}95$
Epoch	2451830.4310	2451881.4668
Period (days)	0.276593	0.365721
V magnitude	14.5	16.0
V amplitude	0.2	0.4
Type	EW	EW

References:

Csák, B., Kiss, L.L., Szabó, Gy., Sárneczky, K., Sziládi, K., 2000a, *IBVS*, No. 4875
Csák, B., Kiss, L.L., Sziládi, K., Sárneczky, K., Szabó, Gy., 2000b, *IBVS*, No. 4881
Guide CD-ROM Star Chart, 1997, Project Pluto, `http://www.projectpluto.com`
Sperl, M., 1998, *Comm. Astr. Seis.*, No. 111