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**GSC 02757-00769 - A NEW EW BINARY SYSTEM**

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<b>Name of the object:</b>	
GSC 02757-00769 = TYC 2757 769 1	
<b>Equatorial coordinates:</b>	<b>Equinox:</b>
R.A.= 22 <sup>h</sup> 56 <sup>m</sup> 30 <sup>s</sup> .899 DEC.= 33°55'12"/07	2000
<b>Observatory and telescope:</b>	
Piwnice Observatory of the Nicholas Copernicus University, 135 mm f/2.8 semi-automatic CCD camera	
<b>Detector:</b>	SBIG ST-7 CCD camera
<b>Filter(s):</b>	SBIG CFW-8 V
<b>Date(s) of the observation(s):</b>	
2002.09.15 – 2002.12.07	
<b>Comparison star(s):</b>	GSC 02757-00477 = SAO 72866 = BD+33°4614 (C1), GSC 02757-01283 = SAO 72860 = BD+33°4612 (C2), GSC 02757-00871 (C3)
<b>Transformed to a standard system:</b>	No
<b>Availability of the data:</b>	
Upon request (aniedzi@astri.uni.torun.pl).	
<b>Type of variability:</b>	EW

**Remarks:**

GSC 02757-00769 (TYC 2757 769 1) was found to be variable by Semi-Automatic Variability Search<sup>1</sup> sky survey operating at the Piwnice Observatory. 243 individual photometric measurements were collected during 18 nights between September and December 2002. The obtained light curve, shown in Figure 1, indicates variability of the W Ursae Majoris type.

According to the Guide Star Catalogue (Morrison et al. 2001) GSC 02757-00769 is a 10.03 photographic magnitude star. In the TYCHO-2 Catalogue (Høg et al. 2000) it is recorded as a star of  $V_T=10^m586$  with the  $(B - V)_T=0^m53$ . The calculated Johnson  $V$  magnitude is  $V=10^m53$  and the  $(B - V)=0^m49$ . The 184 epoch photometry data points listed in Tycho are not available because of low quality (F. Ochsenein - priv.com.)

At the maximum light GSC 02757-00769 reaches  $m_V=10^m50$  and varies in brightness with an amplitude of  $\Delta m_V=0^m24$ . The secondary minimum seems to be shallower and the maximum following the primary minimum is noticeably fainter. Presented here magnitudes were determined with the differential aperture photometry against comparison stars for which  $V$  magnitudes were calculated from TYCHO-2 Catalogue with formula:  $V = V_T - 0.090(B_T - V_T)$ .

The period search was performed with the ANOVA method of Schwarzenberg-Czerny (1996). The time of the primary minimum was computed with the Kwee-van Woerden method (Kwee, van Woerden 1956). A preliminary ephemeris is following:

$$\text{Min. I} = \text{HJD } 2452555.49881 + 0^d419195 \times E. \quad (1)$$

$$\pm 0.00023 \pm 0.000031$$

GSC 02757-00769 is not present in the SIMBAD data base, therefore for proper identification we present a finding chart in Figure 2. The sky image comes from our sky survey and shows a  $30' \times 30'$  field centered at the star of interest.

Practically all W UMa stars in the Solar neighborhood are identified as X-ray emitters (Stępień, Schmitt and Voges 2001). It is also the case of GSC 02757-00769. In the angular distance of 8 arcsec from this object there is an X-ray source 1RXS J225630.4+335507. We suggest that GSC 02757-00769 and 1RXS J225630.4+335507 are in fact the same object. Due to positions coincidence we also identify GSC 02757-00769 with the IR source observed within 2MASS survey - 2MASS J2256308+335512.

**Acknowledgements:**

This research made use of the SIMBAD data base, operated by the CDS at Strasbourg, France.

<sup>1</sup>For further information on SAVS see <http://www.astr.uni.torun.pl/~gm/SAVS/>.

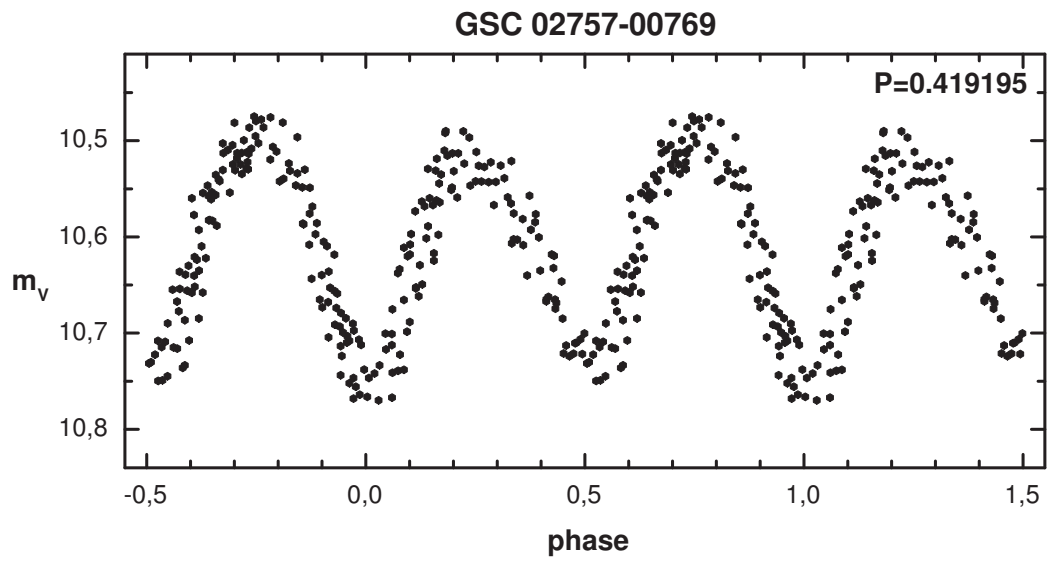


Figure 1. CCD light curve of GSC 02757-00769 obtained in  $V$  filter

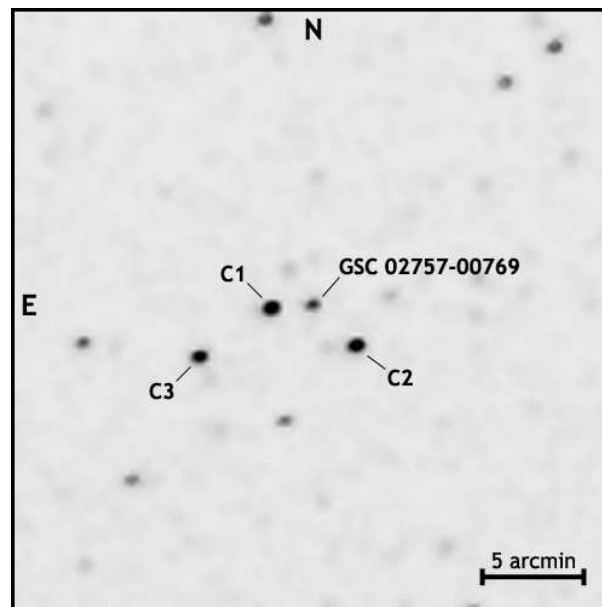


Figure 2. Finding chart for GSC 02757-00769. The field is  $30' \times 30'$  wide.

## References:

- Høg, E., Fabricius, C., Makarov, V. V., Urban, S., Corbin, T., Wycoff, G., Bastian, U.,  
Schwekendiek, P., Wicenec, A., 2000, *A&A*, **355**, L27
- Kwee, K. K., van Woerden, H., 1956, *Bull. Astr. Inst. Netherlands*, **12**, No. 464, 327
- Morrison, J. E., Röser, S.; McLean, B., Bucciarelli, B., Lasker, B., 2001, *AJ*, **121**, 1752
- Schwarzenberg-Czerny, A., 1996, *ApJ*, **460**, L107
- Stępień, K., Schmitt, J.H.M.M., Voges, W., 2001, *A&A*, **370**, 157