NSV 10892 IS A W UMa ECLIPSING BINARY

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Name of the object:
NSV 10892 = HD 170451

Equatorial coordinates:	Equinox:
R.A.= $18^h29^m13^s016$ **DEC.**= $06°47'13''76$	2000

Observatory and telescope:
M. Koppelman: Starhouse Observatory, MN USA, 102-mm refractor;
T. Droege: Private Observatory TASS TOM1, IL USA, dual 100-mm refractors;
D. West: West Skies Observatory, KS USA, 0.2m SCT

Detector:	M. Koppelman: SBIG ST-237A; T. Droege: Custom built dual CCD 442A; D. West: SBIG ST-9E

Filter(s):	M. Koppelman: Johnson V; T. Droege: Johnson V and Cousins I_c; D. West: Johnson/Cousins BVR_cI_c

Date(s) of the observation(s):
2002.06.08 − 2002.08.08

Comparison star(s):	GSC 00445-01017, GSC 00445-01293, SAO 123778

Transformed to a standard system:	M. Koppelman: no; T.Droege: no; D.West: Johnson/Cousins
Standard stars (field) used:	SAO 123778

Availability of the data:
Through IBVS Web-site as file 5327-t1.txt

Type of variability:	EW

Remarks:

Variability of HD 170451 was noted in 1958 (Hiltner, 1958) and it is currently designated NSV 10892 in the Combined General Catalogue of Variable Stars (Kholopov, 1998). Variability was clearly demonstrated by data acquired from the TASS survey (Droege, 2002; Henden, 2001) in June of 2002. The period and nature of the variability was not immediately apparent. The difference of the simultaneous V and I_c TASS observations is constant with a standard deviation of less than $0\overset{m}{.}01$ in the variation of the difference.

Over 1400 V observations were made at Starhouse Observatory to characterise the light curve. The V magnitudes were derived from differential photometry against GSC 00445-01017 and GSC 00445-01293 using Tycho-2 V magnitudes calculated from $V=V_t - 0.090(B_t - V_t)$ (Hog, 2000). These observations put the amplitude of the star at $0\overset{m}{.}36$, with a maximum of $V=9\overset{m}{.}36$ and a minimum of $V=9\overset{m}{.}72$. Standard deviations of the comparison stars' magnitudes were less than $0\overset{m}{.}02$.

Using data from TASS and Starhouse, the period was determined by least-squares Fourier fitting. A preliminary ephemeris for the system is

$$\text{Min. I} = \text{HJD } 2452454.7107 + 0\overset{d}{.}375296 \times E$$
$$\pm 0.0004 \pm 0.000003$$

(1)

Figure 1 shows the characteristic shape of a W UMa binary. The system is most likely associated with the bright X-ray source 1RXS J182912.6+064717, giving further evidence that it is a W UMa system with X-ray emission arising from coronal activity.

BVR_cI_c photometry from West Side Observatory using the Cousins standard SAO 123778 (Cousins, 1980) resulted $B - V=0\overset{m}{.}65$, $V - R_c=0\overset{m}{.}32$, and $V - I_c = 0\overset{m}{.}69 \pm 0\overset{m}{.}03$ colour indices of the variable. These observations were taken near the primary minimum at HJD 2452492.6222.

Coordinates are from the Tycho catalog, adjusted for proper motion by VizieR.
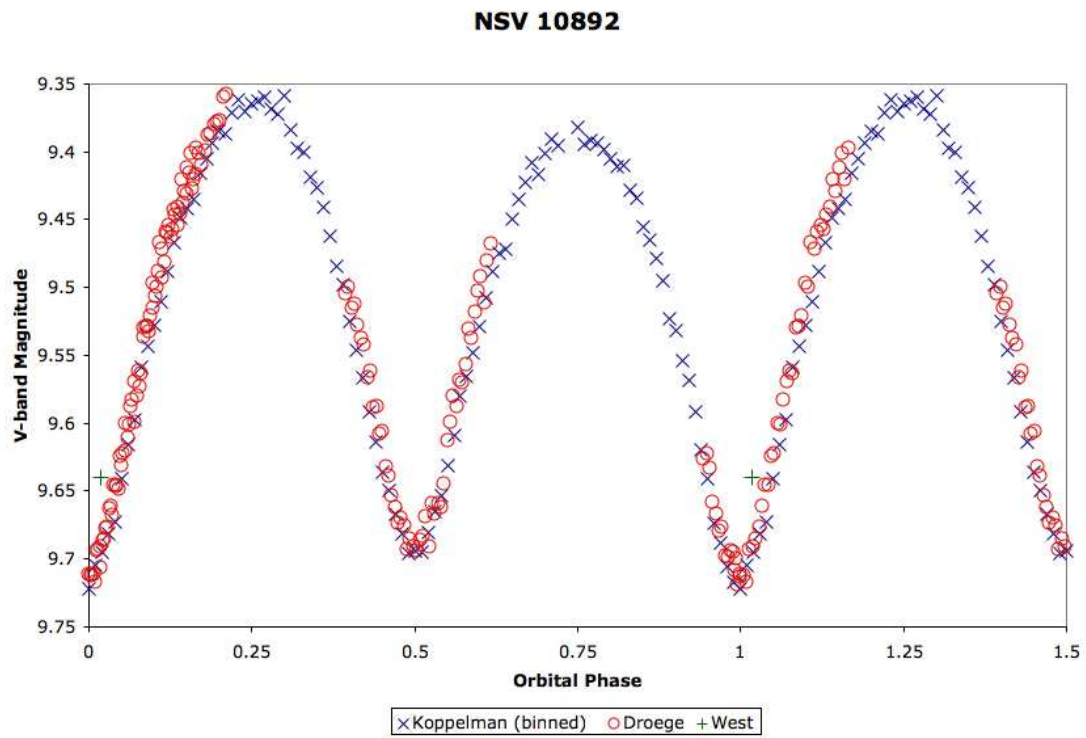
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Figure 1. *V* magnitude vs. orbital phase.

References:

Cousins, A. W., 1980, *South African Astr. Obs. Circ.*, **No. 5**, 234
Droege, T., 2002, The Amateur Sky Survey (TASS), http://www.tass-survey.org/
Henden, A. A., 2001, *JAAVSO*, **29** , 118.
Hiltner, W. A. et al., 1958, *ApJ*, **127**, 539
Hog, E. et al., 2000, *A&A*, **355**, L27
Kholopov, P.N., 1982, New Catalogue of Suspected Variables, (Moscow: Nauka)