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CALIBRATION OF A UBVRI SEQUENCE AROUND NOVA Cyg 2006

FRIGO, A.[1]; OCCNER, P.[1]; TOMASONI, S.[1]; MORETTI, S.[2]; TOMASELLI, S.[2]; GRAZIANI, M.[2]; DALLAPORTA, S.[3]; HENDEN, A.[4]; SIVIERO, A.[5]; MUNARI, U.[5]

[1] Museo Civico di Rovereto, Borgo S. Caterina, 38068 Rovereto (TN), Italy

[2] ARAR, Circoscrizione 3, Via Orceoli 15, Forli, Italy

[3] Via Filzi 9, I-38034 Cembra (TN), Italy

[4] AAVSO, 25 Birch St., Cambridge, MA USA

[5] INAF, Osservatorio Astronomico di Padova, Sede di Asiago, I-36032 Asiago (VI), Italy

Nova Cygni 2006 (= V2362 Cyg) was discovered by H. Nishimura, as reported in Nakano (2006), at mag 10.5 on photographs obtained on April 2.807 UT. Spectroscopic confirmation was given by Yamaoka (2006, and references therein).

The peak brightness reached by the nova ($V \sim 8.5$ on April 5.5 UT) and its slow decline make it a favorable target for protracted observations during the whole summer 2006 season of visibility. To assist interested observers we have calibrated an accurate $UBV(RI)_C$ photometric comparison sequence around the nova, which is identified in Fig. 1 and tabulated in Table 1. The sequence extends over a 6×6 arcmin field centered on the nova itself and the photometric stability of the comparison stars has been checked by repeated observations in twelve independent nights between April and May 2006.

The UBV magnitudes have been calibrated with CCD observations obtained with a variety of private instruments during nine different nights with respect to the Hoag et al. (1961) photoelectric photometry of the nearby open clusters NGC 6910, NGC 6913, NGC 7062, NGC 7063 and NGC 7209. Hoag et al. photometry was obtained with the same instrumentation that was used originally in the definition of the UBV system of Johnson & Morgan (1951, 1953), and it is tightly linked to it. The nova and cluster fields were observed at very similar air-masses during good photometric nights. Color transformation equations were characterized by slopes always within the margins 0.91–1.06. For only two nights the difference in air-mass would project into a ≥ 0.01 mag effect on the derived magnitudes, and for them observations of the reference clusters were protracted long enough to derive the atmospheric extinction coefficients. The telescopes we used were: (a) a 0.50-m f/8 Cassegrain reflector equipped with an Apogee Alta 260e CCD camera and Optec UBV filters located on Mt. Zugna, Rovereto (TN), Italy, (b) a Newton 0.42-m f/5.5 reflector with an Apogee Alta 260e CCD camera and Schuler UBV filters, located in Bastia (RA), Italy, and (c) a Meade RCX 400 12″ f/8 telescope equipped with an SBIG ST-9 CCD camera and native B, V Johnson filters.

The R_C/I_C magnitudes were obtained from the Sonoita Research Observatory (SRO) in southern Arizona (USA), using a 0.35-m robotic telescope and SBIG STL-1001 CCD system. Observations on each photometric night included following an extinction star from

Table 1: Magnitudes and their errors for the stars in the photometric sequence. N indicates the number of nights in which the given star has been measured in the given band. Star a corresponds to TYC 3181-1159-1 = GSC 03181-01159

	U	N_U	B	N_B	V	N_V	$V-R_C$	N_{VR}	$R-I_C$	N_{RI}
a	12.57 ± 0.03	3	11.15 ± 0.01	9	9.70 ± 0.01	9				
b	11.44 ± 0.04	3	11.52 ± 0.01	9	11.23 ± 0.01	9	0.167 ± 0.010	6	0.212 ± 0.018	6
c	11.98 ± 0.04	3	11.94 ± 0.01	9	11.55 ± 0.02	9	0.225 ± 0.014	6	0.261 ± 0.019	6
d	12.89 ± 0.02	3	12.70 ± 0.01	9	12.10 ± 0.01	9	0.338 ± 0.013	6	0.335 ± 0.018	6
e	13.69 ± 0.04	3	13.44 ± 0.01	9	13.05 ± 0.02	9	0.223 ± 0.009	6	0.276 ± 0.017	6
f	14.18 ± 0.04	3	13.95 ± 0.02	9	13.33 ± 0.01	9	0.367 ± 0.014	6	0.364 ± 0.014	6
g	14.46 ± 0.09	3	14.24 ± 0.01	9	13.82 ± 0.01	9	0.244 ± 0.011	6	0.305 ± 0.015	6
h	15.54 ± 0.10	3	14.18 ± 0.02	9	12.70 ± 0.02	9	0.822 ± 0.017	6	0.749 ± 0.019	6
i	14.73 ± 0.05	3	14.32 ± 0.01	9	13.71 ± 0.01	9	0.407 ± 0.014	6	0.421 ± 0.013	6
j	15.52 ± 0.09	3	14.40 ± 0.02	9	12.86 ± 0.01	9	0.910 ± 0.010	6	0.855 ± 0.016	6
l			14.77 ± 0.03	4	14.20 ± 0.04	4	0.326 ± 0.022	6	0.375 ± 0.024	6
m			14.95 ± 0.04	7	13.55 ± 0.01	7	0.783 ± 0.010	6	0.746 ± 0.018	6
n			15.06 ± 0.04	7	14.29 ± 0.02	7	0.476 ± 0.018	6	0.476 ± 0.016	6
p					13.45 ± 0.02	3	0.937 ± 0.010	6	0.862 ± 0.020	6
q					14.56 ± 0.05	6	0.541 ± 0.015	6	0.526 ± 0.019	6

low to high airmass, along with BVR_CI_C exposures of Landolt standard fields (Landolt 1983, 1992). The results were cross-checked using the Asiago 1.82-m and the USNO Flagstaff 1.0-m telescopes and the corresponding equipments.

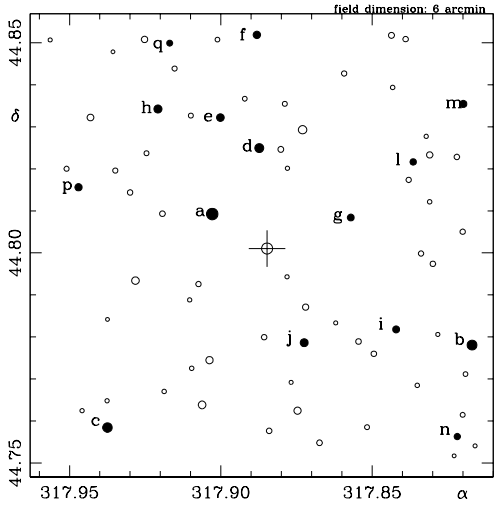

Figure 1. B band finding chart for the photometric sequence. The cross indicates the nova

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