

COMMISSION 27 OF THE I. A. U.
 INFORMATION BULLETIN ON VARIABLE STARS

NUMBER 831

Konkoly Observatory

Budapest

1973 October 3

PHOTOELECTRIC OBSERVATIONS OF 31 CYGNI

DURING THE 1972 ECLIPSE

On seventeen nights between April and July, 1972, photoelectric observations of 31 Cygni were obtained in three colors (UBV) by Landis at his observatory in East Point, Georgia, with a 20.3 cm reflector. An unrefrigerated 1P21 photomultiplier was used with the cathode at -800 volts. The filters used to reproduce the UB system are Corning 3384 (4.5 mm) for visual, Corning 5030 (4.9 mm) plus Schott GG13 (2 mm) for blue, and Corning 9863 (3 mm) for ultraviolet. A full description of the photoelectric equipment used has been made elsewhere (PASP 85, 133, 1973).

All observations were transformed from the natural instrumental system to the standard UB system. The transformation coefficients and their mean errors were found to be $\epsilon = -0.01 \pm 0.01$, $\mu = 1.05 \pm 0.01$, and $\psi = 1.00 \pm 0.02$. Mean extinction coefficients for the Atlanta area were determined from standard stars and were found to be 0.364, 0.471 and 0.765 for yellow, blue and ultraviolet respectively. The data reduction was done by Williamon through the facilities available to the Fernbank Science Center.

Table I

UBV Photoelectric Observations of 31 Cygni

J.D. Hel 2441000+	ΔV	ΔB	ΔU	J.D. Hel 2441000+	ΔV	ΔB	ΔU
431.8855	-1.298	-1.122	-1.671	483.7468	-1.188	-0.752	-0.070
.9024	-1.289	-1.120	-1.691	.7683	-1.191	-0.753	-0.091
432.8835	-1.275	-1.126	-1.671	490.7459	-1.174	-0.728	-0.050
.9043	-1.268	-1.110	-1.685	.7616	-1.167	-0.740	-0.061
433.8838	-1.323	-1.133	-1.644	491.7255	-1.191	-0.736	-0.053
.9060	-1.352	-1.153	-1.668	.7417	-1.189	-0.733	-0.046
441.8857	-1.202	-0.757	-0.084	492.7714	-1.188	-0.750	-0.055
.9042	-1.218	-0.786	-0.143	.7888	-1.182	-0.738	-0.042
442.8818	-1.205	-0.779	-0.114	498.7253	-	-0.764	-0.092
.8990	-1.202	-0.757	-0.065	.7413	-1.176	-0.742	-0.078
446.8679	-1.191	-0.777	-0.130	.7568	-1.185	-0.756	-0.059
.8852	-1.219	-0.712	-0.099	.7730	-1.175	-0.738	-0.065
447.8566	-1.210	-0.786	-0.089	501.7388	-1.268	-1.003	-1.057
.8760	-1.244	-0.798	-0.137	.7548	-1.279	-0.999	-1.063
469.8031	-1.189	-0.760	-0.097	.7702	-	-0.983	-1.065
.8186	-1.166	-0.735	-0.077	504.6875	-1.304	-1.082	-1.528
470.8018	-1.225	-0.739	-0.097	.7019	-1.264	-1.088	-1.551
.8247	-1.176	-0.745	-0.019	519.6520	-1.271	-1.116	-1.728
				.6659	-1.271	-1.120	-1.739

All observations of 31 Cygni were made differentially with respect to 26 Cygni. 30 Cygni was used as an early type check star on several nights and gave no indication of any variability of 26 Cygni. The magnitude differences in each of the three colors are listed in Table I. The first column contains the heliocentric Julian date and the second column the differential magnitude for each color.

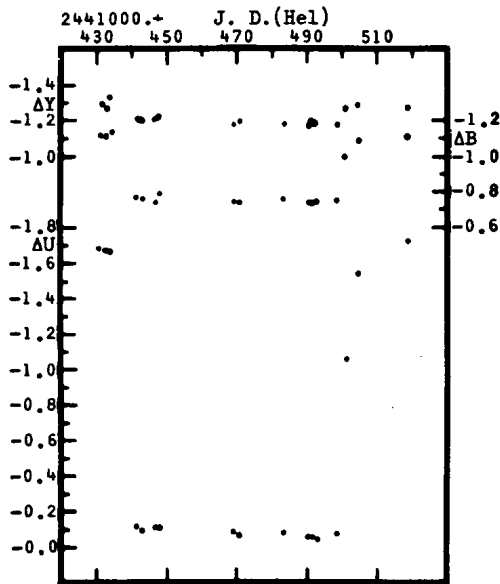


Table II
Properties of the Light Curves

	ΔV	ΔB	ΔU
Light outside eclipse	-1.2934 (8)	-1.1251 (8)	-1.6870 (8)
Light during eclipse	-1.1935 (23)	-.07526 (24)	-0.0797 (24)
Depth	0.0999	0.3625	1.6073

() gives the number of observations

From the average values of ΔV , ΔB , and ΔU during totality and outside of eclipse, the corresponding depths of the eclipses were deduced and are given in Table II. The light curve shown in the figure uses the average value of ΔV , ΔB , and ΔU for each night.

20 August, 1973

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