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NSV 6044: A W UMa STAR

During April 1984 a number of suspected variables were observed with the Danish 50cm telescope on Cerro La Silla, Chile. Among these was NSV 6044, the variability of which was originally discovered by Hoffmeister (1949) who designated it S4963 Cen and classified it as an Algol type variable of magnitude 9-10. The spectral type given by Houk (1982) is G5V.

NSV 6044 was observed seven nights during a period of generally poor photometric quality. Nevertheless, the data can be used to obtain an ephemeris and, as the figure shows, they provide ample information on the general shape of the lightcurve, though it must be emphasized that the data are neither sufficiently numerous nor of adequate quality to justify a proper lightcurve analysis.

Information on the two comparison stars used, including their uvby indices on the standard system, is listed in Table I. There is no indication of variability of the comparison stars. For the variable, average values of the indices are given in Table I and individual magnitude differences in Table II. *u* magnitudes have been omitted because their typical mean errors are larger than 0.01 mag and twice as large as those for *y*, *b*, and *v*.

One time of minimum light could be determined by the method of Kwee and van Woerden (1956). The period was found by using the period analysis program of Jørgensen and Gyldenkerne (1975). The resulting ephemeris is:

$$\text{Min I: } \text{HJD } 2445805.7721 \pm 1 + 0^{\text{d}}.33092 \pm 1 \text{ E}$$

The indices of NSV 6044 show only small variation with phase, and the mean values in the instrumental system are well

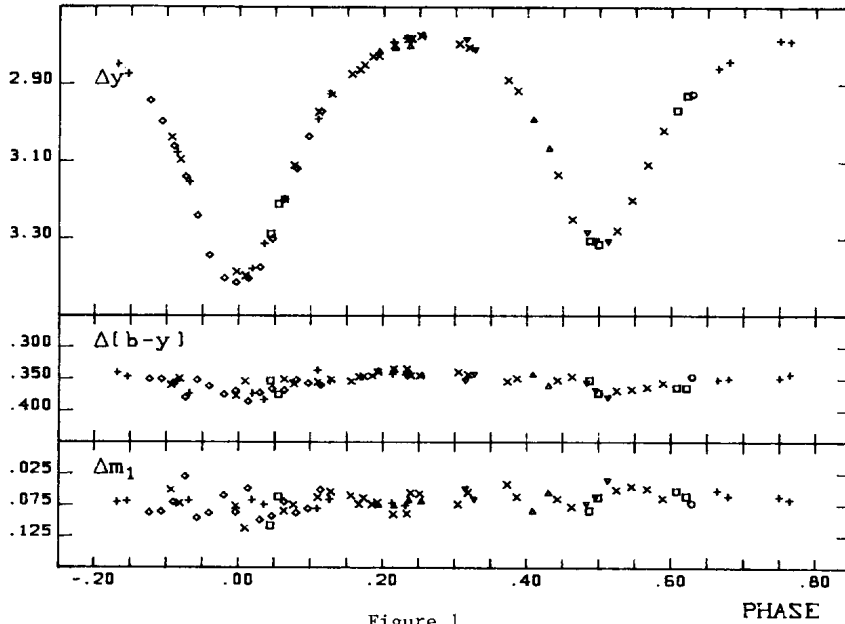


Figure 1

determined. Thus, the dominant contribution to the mean errors comes from the transformation. Mean errors are:  $\sigma(b-y) = 0.009$ ,  $\sigma(m_1) = 0.008$ , and  $\sigma(c_1) = 0.015$ .

TABLE I

	Comparison 1	Comparison 2	Variable
HD number	112563	110653	112669
HR number	-	4838	-
Spectral type	A3V	B8/9V	G5V
No of obs.	92	51	75
V	6.724	6.394	9.51-10.13
b-y	0.071	-0.009	0.433
$m_1$	0.160	0.095	0.210
$c_1$	1.124	0.872	0.296

Physical parameters for NSV 6044 can be estimated following the approach of Rucinski (1983) and making use of the transformations derived by Olsen (1984). This leads to a combined absolute magnitude of 3.9 and a distance of 150 pc, a reddening  $E(b-y) = 0.029$ , reddening corrected indices of  $(b-y)_0 = 0.404$ ,  $(m_1)_0 = 0.219$ ,  $(c_1)_0 = 0.290$ ,  $\delta m_1 = 0.004$ ,  $\delta c_1 = 0.011$ , individual absolute magnitudes (assuming identical components) of  $4.7 \pm 0.1$ ,  $T(\text{eff}) = 5700 \text{ K} \pm 100 \text{ K}$ ,  $[\text{Fe}/\text{H}] = -0.05 \pm 0.08$ ,  $\log g =$

TABLE II: magnitude differences HD 112563 - NSV 6044  
in the instrumental system

HJD-2445000	y	b	v	HJD-2445000	y	b	v
798.69705	2.945	3.298	3.713	801.80005	3.386	3.763	4.217
798.70014	2.925	3.271	3.689	801.80423	3.397	3.751	4.217
799.64595	3.305	3.657	4.093	801.82216	3.199	3.550	3.986
799.65002	3.315	3.687	4.122	801.82649	3.110	3.468	3.901
799.68587	2.967	3.330	3.745	801.85282	2.874	3.228	3.642
799.69044	2.929	3.293	3.718	801.85862	2.851	3.197	3.607
799.83024	3.289	3.642	4.103	801.86513	2.827	3.166	3.576
799.83396	3.211	3.586	4.023	801.87241	2.799	3.133	3.557
800.69746	2.859	3.210	3.613	801.87854	2.783	3.117	3.540
800.70237	2.841	3.190	3.600	803.59088	2.992	3.335	3.763
800.72562	2.786	3.134	3.544	803.59816	3.067	3.428	3.845
800.73053	2.789	3.131	3.540	803.85083	2.816	3.154	3.568
800.75259	2.849	3.189	3.600	803.85812	2.807	3.143	3.556
800.75736	2.874	3.221	3.637	803.86494	2.802	3.145	3.556
800.78011	3.077	3.432	3.860	803.87068	2.773	3.117	3.531
800.78570	3.153	3.526	3.967	805.73124	2.943	3.294	3.733
800.81463	3.378	3.751	4.191	805.73677	2.997	3.348	3.785
800.82012	3.314	3.697	4.155	805.74230	3.062	3.419	3.847
800.84468	2.990	3.326	3.743	805.74766	3.141	3.521	3.931
800.85036	2.924	3.277	3.696	805.75309	3.241	3.593	4.041
800.87906	2.791	3.133	3.547	805.75865	3.344	3.706	4.156
800.88514	2.780	3.123	3.542	805.76543	3.403	3.778	4.213
801.50670	2.972	3.327	3.745	805.77088	3.415	3.784	4.240
801.51273	2.926	3.277	3.682	805.77650	3.404	3.790	4.225
801.52561	2.863	3.210	3.631	805.78193	3.375	3.747	4.218
801.53155	2.829	3.174	3.593	805.78746	3.302	3.668	4.127
801.54930	2.782	3.127	3.528	805.79309	3.198	3.566	4.004
801.55358	2.775	3.120	3.522	805.79865	3.119	3.471	3.911
801.57114	2.796	3.135	3.548	805.80403	3.036	3.393	3.831
801.57567	2.805	3.148	3.546	805.80979	2.970	3.330	3.741
801.59371	2.889	3.243	3.639	809.51628	2.783	3.135	3.535
801.59819	2.917	3.266	3.677	809.52034	2.809	3.150	3.556
801.61674	3.134	3.486	3.903	809.57204	3.282	3.637	4.064
801.62339	3.250	3.596	4.020	809.57614	3.303	3.670	4.098
801.64395	3.279	3.647	4.066	809.58172	3.306	3.684	4.097
801.65081	3.200	3.566	3.977				
801.65790	3.107	3.470	3.882				
801.66513	3.019	3.375	3.795				
801.77024	3.038	3.398	3.809				
801.77423	3.096	3.446	3.869				

$4.46 \pm 0.06$  (cgs). All these values are in good agreement with what one would expect for a G5V star, with the possible exception of  $M_V$  which is 0.4 mag too bright.

In conclusion, NSV 6044 is in all probability a W type W UMa variable of normal metal content and only slightly evolved away from the ZAMS ( $\Delta M_V = 0.14$  mag).

Due to the relative faintness and short period of NSV 6044 no further observations with the Danish 50 cm telescope are planned.

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