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PHOTOELECTRIC OBSERVATIONS OF 53 Cam

The peculiar star 53 Cam (=AX Cam=HR3109=HD 63339), classified as an A2p Sr-Cr-Eu star by Bidelman and Böhm (1955) shows a strong magnetic field varying with a period of about 8 days. The variability of the line intensities (Faraggiana 1973) tends to follow the 8<sup>d</sup> period, whereas radial velocities appear to fit at least two different periods: i) a shorter one lying probably in the range 1-8 days; ii) a longer one (on the order of several years) suggesting for 53 Cam a binary nature.

The light variations (Jarzebowski 1960a, 1960b, Rakos 1962, 1968; Preston and Stepien 1968; Wolff and Wolff 1971; Schöneich et al. 1976) evidence a period of about 8 days, in fairly close agreement with what has been derived from magnetic observations. Moreover, Rakos (1968, see also Faraggiana 1973) argued that a period of about 1 day better fitted his own observations than a longer one of about 8 days.

53 Cam was observed by us during 13 nights in 1970, 9 nights in 1971, 11 nights in 1972 and one night in 1974. The observations were mostly carried out with the 30-cm Cassegrain reflector of the Astronomical Observatory of Trieste, equipped with a single beam photoelectric photometer using UBV filters. The 50-cm Newtonian telescope of the Observatory, equipped with a three-channel simultaneous photoelectric photometer, was used only in some nights. Corrections were allowed for differential extinction and the measures were transformed to the standard UBV system.

Table 1

Comparison star	V	B-V	U-B
HD 62522	7.012±.005	0.573±.005	0.021±.011
HD 62976	6.778±.010	0.100±.004	0.137±.011
HD 65429	6.858±.006	0.376±.006	-0.010±.005
HD 66286	6.693±.006	0.091±.008	0.162±.008
HD 68457	6.420±.009	0.199±.010	0.189±.009

Table 2

JD 2440000+	V	$\sigma$	N	JD 2440000+	B	$\sigma$	N	JD 2440000+	U-B	$\sigma$	N
656.3174	6.048	.003	6	656.3178	6.172	.008	6	656.3178	0.096	.011	4
666.3434	6.030	.009	7	666.3431	6.168	.012	7	666.3362	0.065	.005	6
688.3543	6.033	.013	5	688.3555	6.158	.013	5	688.3561	0.089	.009	5
689.3532	6.032	.007	5	689.3550	6.174	.011	5	689.3558	0.059	.011	5
695.3714	6.044	.004	2	695.3725	6.181	.005	2	695.3729	0.085	.011	2
701.4044	6.017	.006	4	701.4058	6.167	.018	4	701.4064	0.096	.007	4
709.3585	6.023	.034	7	709.3542	6.148	.010	6	709.3598	0.084	.013	7
711.4162	6.023	.015	5	711.4235	6.176	.019	6	711.4198	0.083	.031	5
715.3843	6.033	.020	4	715.3853	6.176	.004	4	715.3854	0.065	.024	5
726.3708	6.032	.015	5	726.3648	6.175	.014	4	726.3653	0.080	.011	4
730.3819	6.030	.006	3	730.3833	6.151	.008	3	730.3840	0.072	.035	3
731.3635	6.016	.007	4	731.3652	6.155	.011	4	731.3588	0.084	.001	2
735.3773	6.025	.006	3	735.3773	6.167	.012	3	735.3798	0.066	.008	3
988.4519	6.029	.012	6	988.4527	6.171	.016	6	988.4531	0.066	.008	6
993.3788	6.035	.010	9	993.3841	6.173	.005	8	993.3802	0.071	.005	4
1008.5005	6.029	.010	10	1008.4905	6.165	.009	9	1008.4998	0.060	.008	9
1008.5261	6.033	.005	5	1008.5277	6.177	.006	5				
1035.3710	6.037	.006	12	1035.3710	6.169	.010	12	1035.3710	0.068	.010	12
1048.3600	6.037	.011	7	1048.3609	6.185	.011	7	1048.3614	0.071	.009	7
1048.3457	6.020	.009	8	1048.3457	6.178	.017	8				
1060.3710	6.034	.013	7	1060.3719	6.169	.011	7				
1081.3557	6.023	.020	8	1061.3567	6.175	.026	8	1061.3572	0.073	.007	7
1062.3424	6.022	.009	9	1062.3433	6.185	.014	9	1062.3437	0.066	.008	8
1083.3346	6.033	.022	8	1063.3357	6.174	.024	8	1063.3361	0.071	.009	9
1363.2979	6.025	.004	9	1363.2938	6.159	.006	8				
1364.2779	6.026	.013	4	1364.2799	6.153	.032	4				
1392.2574	6.023	.014	8	1392.2539	6.177	.012	9				
1398.3548	6.032	.015	24	1398.3548	6.181	.016	24				
1399.3566	6.026	.012	26	1399.3566	6.181	.014	26				
1401.3993	6.038	.014	17	1401.4023	6.188	.025	16				
1402.3528	6.036	.010	16	1402.3538	6.175	.013	16				
1414.3483	6.032	.013	18	1414.3495	6.176	.008	18				
1415.3568	6.026	.013	12	1415.3579	6.177	.018	12				
1417.3519	6.030	.008	14	1417.3527	6.180	.005	14				
1648.5015	6.022	.004	11	1648.5024	5.171	.005	11				
2120.4281	6.032	.009	16	2120.4281	5.168	.013	16	2120.4281	0.073	.005	16

Data (together with their standard deviation) of the five comparison stars adopted are given in Table 1. No variability of these stars has been detected within the errors. The normal points of the photoelectric data of 53 Cam together with their standard deviation  $\sigma$  and the number N of observations are listed in Table 2.

The character of brightness variations is noticeably less remarkable in U light than in B and V, since U data are affected by considerable observational errors. The observational scatter along with the small amplitude of light variations makes it impossible to determine with precision the shapes of the B and V lightcurves. A rough analysis of our data reveals that brightness variations fit two different periods, a longer one of about 8.0 days and a shorter one of about 1.14 days; this latter period may be an effect due to aliasing.

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