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PHOTOELECTRIC OBSERVATIONS OF EV Lac

Between 1972 and 1976 a series of photoelectric observations was made on the flare star EV Lac at the Stephanion Observatory by the staff of the Department of Geodetic Astronomy, University of Thessaloniki, with a 30 inch reflector equipped with a cooled Johnson dual channel photometer (RCA 1P21 multiplier) and Johnson standard UBV filters. The measurements were secured by a Hewlett-Packard 7100 B chart recorder.

The data of the comparison stars are given in Table I, the observations of the variable (nightly means) in Table II. The tie-in observations were also made at Stephanion Observatory.

Table I

Comparison	V	B
a = BD +43 ^o 4299	9.16	10.33
b = BD +43 ^o 4296	9.97	10.83

The characteristics of the flares observed during the period 1971-1975 and 1978 have been already published (Contadakis, Mavridis 1972; Asteriadis, Mavridis, Stavridis 1973; Arabelos, Kareklidis, Mavridis, Stavridis 1978; Contadakis, Kareklidis, Tsioumis 1979; Contadakis, Mahmoud, Mavridis, Stavridis 1980; Avgouloupis, Kareklidis, Mavridis, Phylactopoulos, Varvoglis 1980).

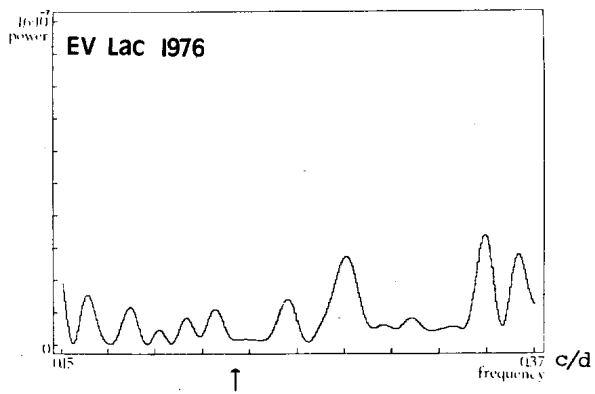
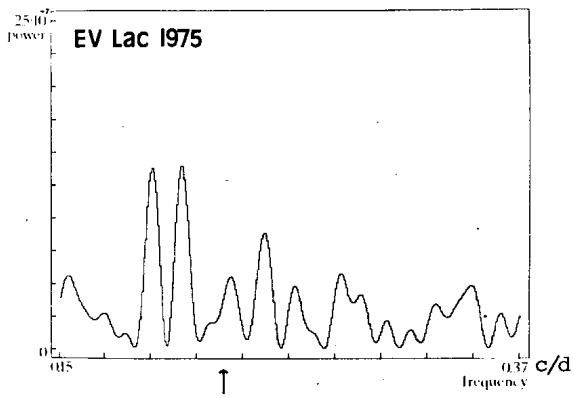
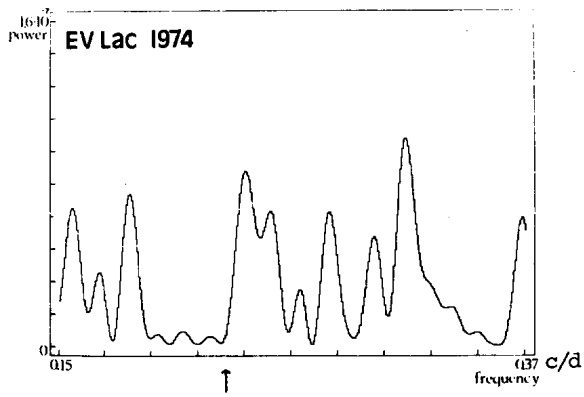
Mahmoud (1978) determined the quiet state magnitudes of the flare star EV Lac corresponding to the period 1972-1976 for a discussion of the photoelectric behaviour of the star during quiescent state. His material has been used in this present paper for the purpose of periodicities detection in the variation of the quiet state luminosity of the star.

In order to find any periodic variation in the star's brightness during quiescent light, Fourier analyses of the observed data

Table II

Photoelectric yellow and blue observations of EV Lac

J.D.	V	J.D.	V	J.D.	V	J.D.	V
2440000+		2440000+		244000+		2440000+	
1545.414	10.08	1950.386	9.97	2306.419	10.07	3026.445	10.05
1547.476	10.01	1952.392	10.01	2308.411	10.09	3033.419	9.97
1569.524	9.91	2269.515	10.08	2310.407	10.05	3034.423	9.97
1570.437	10.02	2271.494	10.05	2637.502	10.23	3035.422	9.98
1572.412	10.11	2273.502	10.08	2642.490	10.19	3036.420	9.95
1929.435	10.04	2282.474	10.08	2644.490	10.20	3037.413	9.97
1931.463	10.00	2283.485	10.09	2652.463	10.22	3038.408	9.95
1933.428	10.02	2284.485	10.07	2653.470	10.24	3039.406	9.99
1934.443	10.03	2285.488	10.03	2656.475	10.24	3040.406	9.96
1935.440	10.05	2291.517	10.20	2996.537	9.95	3041.396	10.00
1941.419	9.90	2293.481	10.07	2999.523	9.87	3047.394	9.95
1942.406	9.98	2295.475	10.05	3009.487	9.98	3048.378	9.98
1943.391	10.04	2296.459	10.06	3021.478	9.95	3050.369	9.99
1944.427	9.87	2297.459	10.06	3024.443	9.96	3051.370	9.95
1946.400	10.01	2300.428	10.10	3025.438	9.97	3052.370	10.01
1948.395	9.99	2305.417	10.15				
J.D.	B	J.D.	B	J.D.	B	J.D.	B
1545.414	11.55	2274.363	11.47	2654.348	11.58	3018.486	11.42
1547.476	11.42	2282.446	11.44	2655.332	11.60	3019.448	11.46
1569.524	11.47	2283.449	11.46	2656.419	11.61	3020.451	11.42
1570.437	11.46	2284.413	11.45	2658.488	11.59	3021.469	11.41
1572.412	11.53	2285.457	11.41	2688.429	11.66	3022.502	11.43
1929.435	11.42	2291.464	11.54	2689.397	11.57	3023.451	11.42
1931.463	11.38	2293.426	11.42	2690.337	11.59	3024.473	11.42
1933.428	11.43	2294.468	11.35	2693.415	11.63	3025.459	11.41
1934.443	11.39	2295.474	11.47	2694.392	11.57	3026.443	11.46
1935.440	11.46	2296.426	11.37	2696.276	11.63	3027.429	11.46
1941.419	11.32	2297.461	11.40	2697.349	11.66	3033.459	11.42
1942.406	11.38	2300.444	11.47	2707.289	11.66	3034.452	11.46
1943.391	11.39	2305.420	11.50	2981.521	11.37	3035.444	11.44
1944.427	11.29	2306.419	11.46	2982.488	11.39	3036.430	11.42
1946.400	11.41	2308.398	11.46	2983.531	11.36	3037.435	11.40
1948.398	11.39	2310.365	11.36	2996.531	11.40	3038.454	11.41
1950.386	11.36	2324.478	11.60	2998.421	11.39	3039.385	11.43
1952.392	11.41	2327.436	11.46	2999.529	11.39	3040.454	11.38
2239.514	11.41	2329.454	11.45	3003.458	11.39	3041.417	11.44
2240.514	11.48	2613.458	11.64	3005.456	11.41	3047.438	11.38
2241.543	11.44	2615.430	11.73	3007.457	11.41	3048.400	11.43
2245.513	11.46	2635.479	11.61	3008.475	11.41	3050.405	11.42
2247.477	11.43	2636.487	11.65	3009.491	11.41	3051.411	11.41
2247.560	11.49	2637.455	11.56	3010.403	11.42	3052.400	11.46
2248.435	11.51	2640.465	11.66	3011.444	11.46	3054.436	11.44
2267.496	11.46	2642.535	11.62	3012.503	11.44	3055.407	11.42
2269.479	11.47	2644.466	11.61	3013.500	11.44	3062.320	11.31
2270.506	11.51	2652.402	11.61	3016.447	11.43	3063.438	11.46
2271.462	11.43	2653.440	11.63	3017.464	11.44	3064.453	11.16
2273.465	11.45						



Figures 1, 2 and 3

were made. Since the dMe stars show slow, small amplitude light variations with periods of the order of some days, the period search was made between 0.1 and 1 cycle/day (1 and 10 days) for each year's observations, separately. The calculations were carried out with the TPAI computer of Konkoly Observatory.

A light variation of $4^d.378$ period and about $0^m.07$ amplitude was detected by Pettersen (1980) concerning his 1979 observations.

Figures 1, 2 and 3 display the periodograms of EV Lac. Although there are some peaks in the graphs, all of them are under the significance level. The arrows indicate the value where Pettersen's period was found.

It is mentioned that the average brightness of EV Lac in 1975 seems to be about 0.2 magnitude fainter (both in V and B), and also the flare activity of the star was weaker than in the other years (see Mahmoud, 1980).

In this star during the observed time intervals no periodic light variations have been found. This result means that either the star had constant brightness during the time of observations, or the amplitude of the possible light variations are less than the observational error.

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