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PHOTOELECTRIC OBSERVATIONS OF THE FLARE STAR EV Lac IN 1985

Photoelectric monitoring of the flare star EV Lac has been carried out at the Stephanion Observatory during the year 1985 using the 30-inch Cassegrain reflector of the Department of Geodetic Astronomy, University of Thessaloniki. Observations have been made with a Johnson dual channel photoelectric photometer in the B colour of the international UBV system. The telescope and photometer used have been described elsewhere (Mavridis et al., 1982).

The transformation of our instrumental ubv system to the international UBV system is given by the following equations:

a) For the period June 20-July 10, 1985
$V = v_o + 0.086\ (b-v)_o + 2.160,$
$B-V = 0^o.376 + 1.035\ (b-v)_o.$

b) For the period August 7-14, 1985
$V = v_o + 0.037\ (b-v)_o + 2.020,$
$B-V = 0^o.393 + 1.050\ (b-v)_o.$

c) For the period September 2-8, 1985
$V = v_o - 0.020\ (b-v)_o + 1.953,$
$B-V = 0^o.451 + 1.007\ (b-v)_o.$

The monitoring intervals in UT as well as the total monitoring time for each night are given in Table I. Any interruption of more than one minute has been noted.

During the 31.82 hours of monitoring time one flare was observed, the characteristics of which are given in Table II. In this table following characteristics (Andrews et al. 1969) are given: a) the date and universal time of flare maximum, b) the duration before and after the maximum (t_b and t_a, respectively), as well as the total duration of the flare, c) the value of the ratio $(I_f-I_o)/I_o$ corresponding to flare maximum, where I_o is the intensity deflection less sky background of the quiet star and I_f is the total intensity deflection less sky background of the star plus flare, d) the integrated inten-

Table I

Monitoring Intervals

Date	Monitoring intervals (U.T.)	Total Monitoring Time
1985		
June		
21-22	23^h42^m-00^h13^m, 00^h17^m-01^h00^m,	1^h14^m
23-24	23 33 -00 04 , 00 07 -00 37 ,	
	00 39 -01 06 .	1 28
24-25	23 30 -00 02 , 00 05 -00 32 ,	
	00 45 -01 10 .	1 24
26-27	23 51 -00 24 , 00 27 -01 00 .	1 06
27-28	23 22 -23 37 , 23 39 -23 50 ,	
	23 53 -00 26 , 00 38 -01 00 .	1 21
29	00 01 -00 31 , 00 33 -01 01 .	58
July		
7-8	22 51 -23 20 , 23 23 -23 59 ,	
	00 14 -00 45 , 00 48 -01 12 .	2 00
8-9	22 51 -23 25 , 23 28 -00 02 ,	
	00 15 -00 46 , 00 49 -01 12 .	2 02
9-10	23 04 -23 36 , 23 38 -00 13 ,	
	00 33 -01 06 .	1 40
August		
7	22 37 -23 01 , 23 03 -23 30 ,	
	23 35 -23 44 .	1 00
8	23 04 -23 20 .	16
9-10	22 01 -22 29 , 22 32 -22 46 ,	
	22 48 -23 02 , 23 05 -23 19 ,	
	23 21 -23 41 , 23 43 -23 57 ,	
	00 57 -01 08 .	1 55
10-11	22 01 -22 20 , 22 22 -22 41 ,	
	22 43 -23 05 , 23 07 -23 23 ,	
	23 25 -23 41 , 23 43 -00 02	1 51
11-12	22 23 -22 47 , 22 49 -23 06 ,	
	23 11 -23 41 , 23 44 -00 14 ,	
	00 17 -00 50 , 00 52 -01 19 .	2 41
14	22 14 -22 28 , 22 30 -22 57 .	41

Table I (continued)

Date 1985 September	Monitoring intervals (U.T.)	Total Monitoring Time
2	21^h36^m-22^h10^m, 22^h15^m-22^h54^m, 22 58 -23 47 .	$2^h\ 2^m$
3-4	22 20 -22 45 , 22 50 -23 41 , 00 06 -01 03 .	2 13
4-5	22 45 -22 59 , 23 45 -00 22 , 00 29 -01 11 .	1 33
6-7	22 24 -22 58 , 23 04 -23 46 , 00 14 -01 00 .	2 2
7-8	22 02 -22 37 , 22 43 -23 36 , 00 05 -00 35 , 00 38 -01 02 .	2 22
	TOTAL	31^h49^m

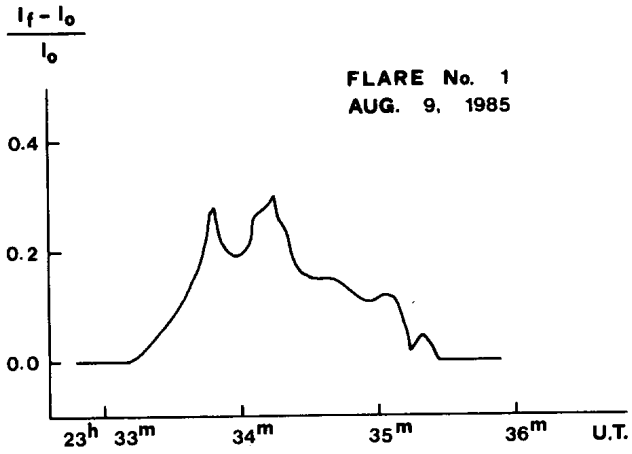
Table II
Characteristics of the Flare Observed

Flare No.	Date	U.T. (max)	t_b (min)	t_a (min)	Duration (min)
1	1985 August 9	$23^h\ 34^m.24$	1.10	1.16	2.26

$(I_f-I_o)/I_o$ (max)	P (min)	Δm (mag)	σ (mag)	Air mass
0.30	0.30	0.29	0.03	1.019

sity of the flare over its total duration, including pre-flares, if present, $p = \int (I_f - I_o)/I_o dt$, e) the increase of the apparent magnitude of the star at flare maximum $\Delta m(b) = 2.5 \log (I_f/I_o)$, where b is the blue magnitude of the star in the instrumental system, f) the standard deviation of random noise fluctuation $\sigma(mag) = 2.5 \log (I_o+\sigma)/I_o$ during the quiet - state phase immediately preceding the beginning of the flare and g) the air mass at flare maximum.

The light curve of the observed flare in the b colour is shown in Fig. 1.



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