PHOTOELECTRIC OBSERVATIONS OF THE FLARE
STAR EV Lac IN 1982

   Continuous photoelectric monitoring of the flare star EV Lac has been
carried out at Stephanion Observatory during the autumn 1982 in the frame-
work of the Program for Scientific and Technical Co-operation between the
Department of Geodetic Astronomy, University of Thessaloniki – Greece and
the Department of Astronomy with National Astronomical Observatory, Bulgarian
Academy of Sciences – Bulgaria.

   Observations have been made with the 30-inch Cassegrain reflector at
Stephanion Observatory with a Johnson dual channel photoelectric photometer
in B colour of the international UBV system. The telescope and the photometer
have been described elsewhere (Mavridis et al., 1982). The transformation of
our instrumental ubv system to the international UBV system for the year
1982 is given by the following equations:

$$V = v_o - 0.011 \ (b-v)_o + 3.288$$

$$B - V = 0.597 + 1.010 \ (b-v)_o$$

$$U - B = -1.899 + 1.031 \ (u-b)_o$$

   The monitoring intervals in U.T. as well as total monitoring time for
each night are given in Table I. Any interruption of more than one minute
has been noted. In the fourth column of Table I   the   standard deviation
of ramdom noise fluctuation $-\sigma(mag) = 2.5 \log \ (I_o + \sigma)/I_o$, for different
times (U.T.) of the corresponding monitoring intervals is given.

   During the 11.15 hours of monitoring time 6 flares were observed the
characteristics of which are given in Table II. For each flare the following
characteristics (Andrews et al., 1969) are given:

   a. the date and universal time of maximum,

   b. the duration before and after maximum (t_b and t_a, respectively) as well
as the total duration of the flare.

c. the value of the ratio $(I_f-I_o)/I_o$ correspondig 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 integral intensity 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 of 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.

g. the air mass at flare maximum.

Table I

Monitoring intervals in 1982

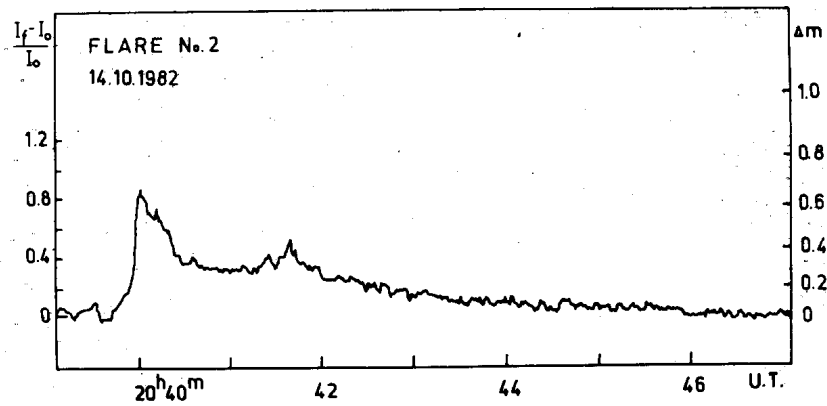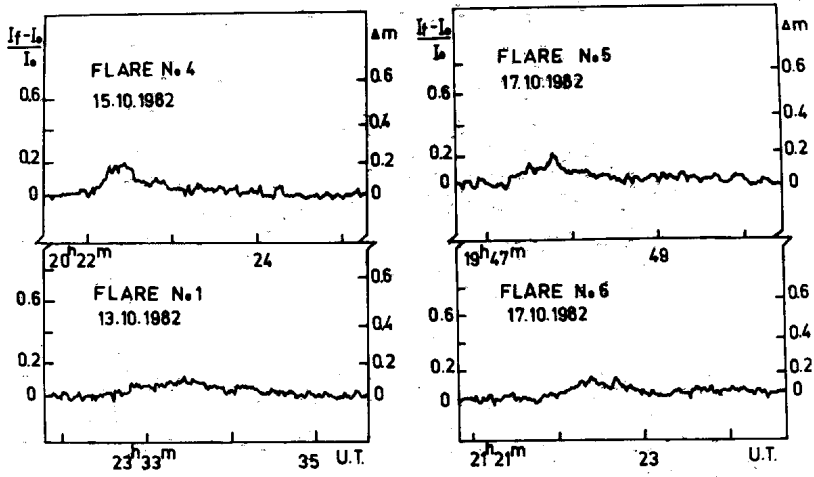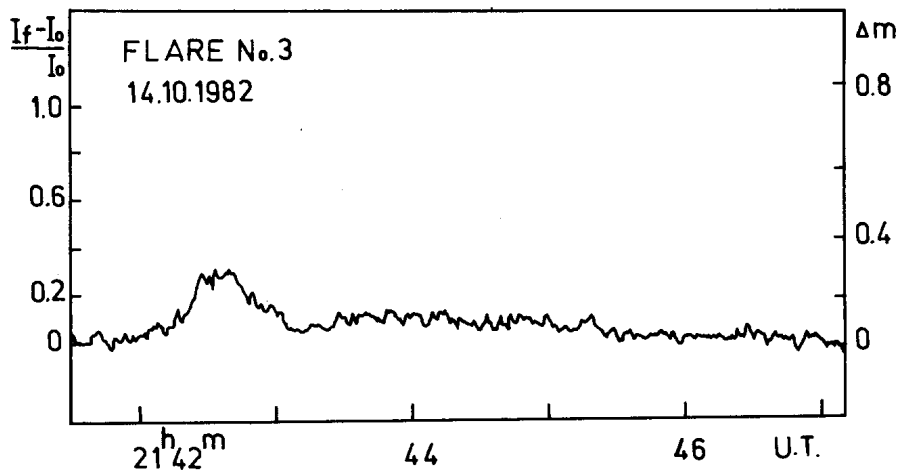| Date 1982	Monitoring intervals (U.T.)	Total Monitoring Time	σ_{mag}(U.T.)
Oct.13	$19^h06^m-19^h49^m,19^h52^m-20^h27^m$, 20 30 -21 09 ,21 28 -21 42 , 21 43 -22 12 ,22 15 -22 57 , 22 59 -23 39 .	4^h02^m	$0.02(19^h24^m),0.02(20^h18^m)$, 0.03(21 05),0.03(21 33), 0.03(22 06),0.03(22 55), 0.02(23 31).
14	20 21 -20 49 ,20 51 -21 00 , 21 03 -21 23 ,21 26 -21 52 , 21 53 -22 36 ,22 39 -22 43 .	2 10	0.03(20 36),0.03(20 55), 0.03(21 10),0.03(21 40), 0.03(22 13),0.07(22 40).
15	19 11 -19 31 ,19 35 -19 56 , 19 59 -20 26 ,20 29 -20 44 , 21 52 -22 01 ,22 03 -22 31 .	2 00	0.02(19 18),0.03(19 53), 0.03(20 20),0.03(20 34), 0.03(21 57),0.03(22 27).
17	18 27 -19 25 ,19 26 -19 52 , 19 54 -20 33 ,20 35 -21 29 .	2 57	0.02(19 00),0.02(19 46), 0.02(20 18),0.03(21 20).

Total = 11^h09^m

Table II

Characteristics of the Flares Observed

Flare No.	Date 1982	U.T. max	t_b min	t_a min	Dura-tion min	$\dfrac{I_f-I_o}{I_o}$ max	P min	Δm mag	σ mag	Air mass
1.	Oct.13	$22^h33^m\!.4$	1.06	1.34	2.40	0.127	0.092	0.13	0.02	1.320
2.	14	20 40.1	0.30	5.90	6.20	0.857	1.389	0.67	0.03	1.025
3.	14	21 42.6	0.60	4.60	5.20	0.311	0.347	0.29	0.03	1.090
4.	15	20 22.4	0.42	1.90	2.32	0.181	0.107	0.18	0.03	1.019
5.	17	19 47.8	0.52	2.32	2.84	0.190	0.110	0.19	0.02	1.008
6.	17	21 22.4	0.60	0.77	1.37	0.155	0.078	0.16	0.03	1.078

The light curves of the observed flares in the b colour are shown in Figs. 1-6.

FLARE No. 4
15.10.1982

FLARE No. 1
13.10.1982

FLARE No. 5
17.10.1982

FLARE No. 6
17.10.1982

FLARE No. 2
14.10.1982

Figures 1-6

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Mavridis L.N., Asteriadis G.A. and Mahmoud F.M., 1982, In: Compendium in
   Astronomy, D. Reidel, Dordrecht, Holland, p. 245