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PHOTOELECTRIC OBSERVATIONS OF UV CETI

Continuous photoelectric monitoring of the flare star UV Ceti was carried out at Stephanion Observatory during 1981 and 1982 in the framework of the Program for Scientific and Technical Co-operation between Department of Geodetic Astronomy, University of Thessaloniki - Greece and 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 the 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 years and 1981 and 1982 is given by the following equations:

$$V = v_o - 0.023(b-v)_o + 3.202$$
$$B - V = 0.582 + 1.004(b-v)_o \qquad (1981)$$
$$U - B = -1.869 + 1.021(u-b)_o$$

$$V = v_o - 0.011(b-v)_o + 3.288$$
$$B - V = 0.597 + 1.010(b-v)_o \qquad (1982)$$
$$U - B = -1.899 + 1.031(u-b)_o$$

The monitoring intervals in U.T. 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. The standard deviation of random noise fluctuation - $\sigma(\max) = 2.5 \log(I_o+\sigma)/I_o$, for different times (U.T.) of the corresponding monitoring intervals is given in the fourth column of Table I.

During the 5.2 hours of monitoring time 3 flares were observed the characteristics of which are given in Table II. For each flare following characteristics (Andrews et al., 1969) are given:

a. The date and universal time of maximum.

Table I

Monitoring intervals in 1981 and 1982

Date	Monitoring intervals(U.T.)	Total Monit. Time	σ(U.T.)
1981 Sept.30	02^h12^m–02^h58^m, 02^h59^m–03^h03^m,	0^h50^m	0.13(02^h30^m), 0.13(03^h00^m)
1982 Oct.14	00 00 –00 21 , 00 25 –00 40,	1^h07^m	0.12(00 03), 0.12(00 26)
	00 42 –01 00 , 01 03 –01 16.		0.11(00 44), 0.21(00 08)
14/15	23 59 –00 03 , 00 05 –00 23,	0^h43^m	0.10(00 02), 0.08(00 19)
	00 24 –00 36 , 00 38 –00 47.		0.08(00 32), 0.17(00 39)
15	22 45 –23 41 , 23 43 –23 56,	1^h28^m	0.09(23 10), 0.13(23 45)
	23 59 –00 07 , 00 09 –00 20.		0.15(00 04), 0.14(00 14)
17	21 52 –22 02 , 22 04 –22 58.	1^h04^m	0.12(21 54), 0.16(22 17)

Total = 5^h12^m

Table II

Characteristics of the Observed Flares

Flare No	Date 1982	U.T. max	t_b min	t_a min	Duration min	$\frac{I_f-I_o}{I_o}$ max	P min	Δm mag	σ mag	Air mass
1.	Oct.14	$00^h03^m.1$	0.06	1.66	1.72	0.630	0.361	0.53	0.12	1.955
2.	14	00 29.3	0.06	1.48	1.54	2.063	0.525	1.22	0.12	2.101
3.	15	23 46.4	0.08	2.42	2.50	4.505	0.920	1.85	0.13	1.917

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 $(I_f-I_o)/I_o$, 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.

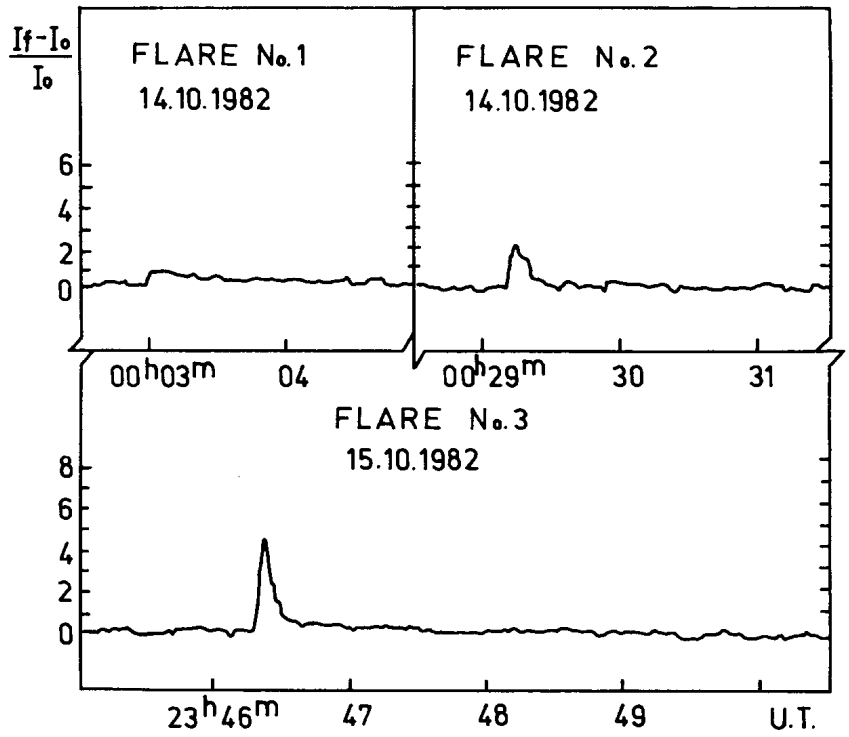
d. The integral intensity of the flare over its total duration, including pre-flares, if present: $P = \int (I_f-I_o)/I_o \, dt$.

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.

The light curves of the observed flares in the b colour are shown in Figures 1-3.



Figures 1-3

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