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PHOTOELECTRIC OBSERVATIONS OF THE FLARE STAR AD Leo IN 1976

Continuous photoelectric monitoring of the flare star AD Leo has been carried out at the Stephanion Observatory ($\lambda = -22^{\circ}49'44''$, $\varphi = +37^{\circ}45'15''$) during the year 1976, 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 will be described elsewhere. Here we mention only that the transformation of our instrumental ubv system to the international UBV system is given by the following equations:

$$V = v_0 - 0.008(b-v)_0 + 2.292,$$

$$(B-V) = 0.737 + 1.043(b-v)_0,$$

$$(U-B) = -1.798 + 1.131(u-b)_0.$$

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.

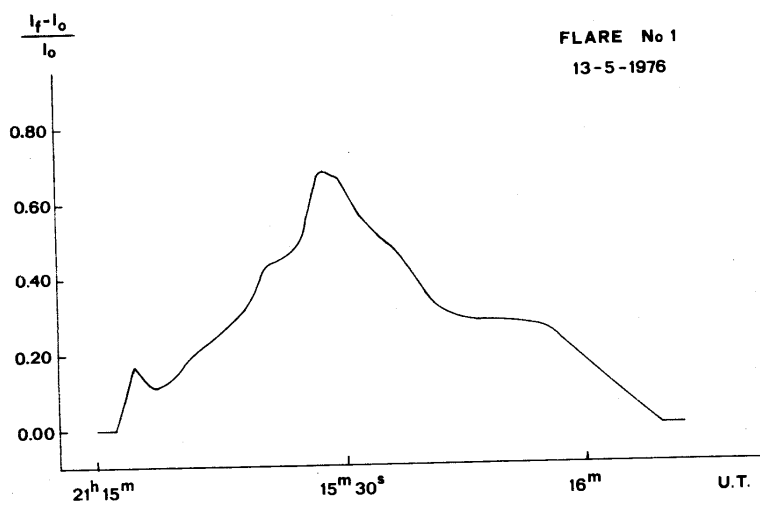
Table I

Monitoring intervals in 1976

Date	Monitoring intervals (U.T.)	Total Monitoring Time	σ (U.T.)
1976			
May 13	19 ^h 56 ^m -20 ^h 33 ^m , 20 ^h 36 ^m -21 ^h 03 ^m , 21 05 -21 24, 21 36 -22 10.	01 ^h 57 ^m	0.06 (19 ^h 58 ^m), 0.09 (20 ^h 39 ^m), 0.09 (21 09), 0.11 (21 38).
27	20 05 -20 35, 20 37 -21 02.	00 55	0.06 (20 17), 0.06 (20 39).
June 2	19 38 -20 15, 20 17 -20 44, 20 46 -21 20.	01 38	0.05 (19 43), 0.07 (20 21), 0.07 (20 57).

Total 04^h30^m=4^h50

In the fourth column of Table I the standard deviation of random



noise fluctuation $\sigma(\text{mag})=2.5 \log(I_0+\sigma)/I_0$ for different times (UT) of the corresponding monitoring intervals is given.

During the 4.5 hours of the monitoring time one flare was observed the characteristics of which are given in Table II.

Table II

Characteristics of the flare observed

Flare No.	Date	U.T.	t_b	t_a	Duration	I_f-I_0/I_0	P	Δm	σ	Air mass
	1976	max	min	min	min	max	min	mag	mag	mass
1	13 May	21:15:47	0.44	0.72	1.16	0.68	0.32	0.56	0.09	1.68

For this flare 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 $(I_f-I_0)/I_0$ corresponding of flare maximum, where I_0 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 intensity of the flare over its total duration, including pre-flares, if present, $P=\int(I_f-I_0)/I_0 dt$, e) the increase of the apparent magnitude of the star at flare maximum $\Delta m(b)=2.5 \log(I_f/I_0)$, where b is the blue magnitude of the star in the instrumental system, f) the standard deviation of random noise fluctuation $\sigma(\text{mag}) = 2.5 \log(I_0+\sigma)/I_0$ 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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