COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS

NUMBER 750

Konkoly Observatory
Budapest
1972 December 30

PHOTOELECTRIC SURVEILLANCE OF THE FLARE STARS YZ CMi, AD Leo AND EV Lac

The results of the photoelectric patrolling of the dMe flare stars YZ CMi, AD Leo and EV Lac on a total of 28 nights, through a standard B filter, on a 56-cm reflector equipped with an unrefrigerated 1P21 photomultiplier, are herein reported. Tables Ia, Ib and Ic give details of the coverage of the stars.

Four flares were recorded on the stars observed. Details of the flares, are given in Table II.

The light curves of the flares show that while the flare of YZ CMi is reminiscent of a Type I flare in Oskanyan's classification (Oskanyan, 1969), those of AD Leo and EV Lac resemble his Type II.

On a few nights the observations were taken by Messers T.R. Bhatt and T.C. Tewari, to whom our thanks are due.

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References:

Erro, B.I.: 1971, Bol.Obs. Tonantzintla y Tacubaya, 6,143.
Oskanyan, V.S.: 1969, Non-periodic Phenomena in Variable Stars, Ed. L.Detre, Academic Press, Budapest 131.
Oskanyan, V.S.: 1970, I.B.V.S. No.488.

TABLE Ia

COVERAGE OF YZ CMi

(Times are rounded to the next minute of U.T.)

Date, 1972				
9 Feb.	17^h15^m-18^m,	17^h21^m-33^m,	17^h35^m-18^h31^m.	
18 Feb.	17 04 -24 ,	17 15 -27 ,		
21 Feb.	17 35 -47 ,	17 51 -18 13,	18 14 -19 ,	18 22 -41,
	18 43 -51 ,	18 53 -56 ,	19 12 -32 ,	19 35 -43.
14 Mar.	15 06 -29 ,	15 33 -38 ,	15 42 -58 ,	15 59 -16 41,
	16 44 -17 02,	17 11 -15 ,	17 18 -22 ,	17 25 -44,
	17 46 -18 09,	18 20 -31 ,	18 34 -19 04.	
16 Mar.	15 02 -23 ,	15 24 -16 09,	16 11 -15 ,	16 18 -23,
	16 30 -52 ,	16 53 -17 18,	17 27 -18 03,	18 06 -23,
	18 39 -19 05,			
17 Mar.	15 03 -16 16,	16 18 -23 ,	16 29 -17 18,	17 26 -18 04,
	18 06 -27 ,	18 39 -19 06,		
18 Mar.	14 46 -53 ,	14 55 -15 37,	15 42 -16 10,	16 17 -17 04.
22 Mar.	14 14 -39 ,	14 40 -15 24,	15 26 -59 ,	16 02 -30,
	16 35 -45 ,	16 59 -17 41,	17 43 -18 28.	
3 Apr.	15 13 -15 ,	15 19 -25 ,	15 28 -43 ,	15 44 -16 22,
	16 28 -17 02,	17 12 -19 ,	17 20 -22 ,	17 25 -29,
	17 36 -39 .			
7 Apr.	14 46 -15 38,	15 39 -50 ,	15 52 -16 18,	16 23 -46,
	16 48 -17 07,	17 08 -30 .		
6 May	14 57 -15 31,	15 37 -43 .		

Total Coverage : 24^h30^m spread over 11 nights

TABLE Ib

COVERAGE OF AD Leo

Times are rounded to the next minute of U.T.

Date, 1972				
11 Apr.	17^h39^m-18^h24^m,	18^h25^m-34^m,	18^h36^m-19^h08^m,	19^h10^m-20^h23^m.
12 Apr.	16 12 -17,	16 29 -45,	16 47 -17 01,	17 05 -12,
	17 17 -53,	17 56 -18 07,	18 10 -23,	18 25 -38,
	18 39 -59,	19 00 -05,	19 07 -18,	19 20 -38,
	19 39 -20 08,	20 10 -21.		
14 Apr.	18 38 -42,	18 44 -49,	18 51 -19 08,	19 10 -16,
	19 28 -40,	19 41 -46,	19 47 -20 04,	20 05 -24,
	20 25 -40.			
3 May	14 46 -52,	14 54 -15 20,	15 24 -35,	15 38 -16 20,
	16 24 -48,	16 51 -17 20,	17 31 -18 00,	18 06 -26,
	18 31 -49.			
6 May	16 13 -33.			
7 May	15 37 -56,	16 01 -08,	16 12 -36,	16 42 -17 12,
	17 13 -35,	17 38 -56,	18 00 -12,	18 14 -28,
	18 31 -35.			
8 May	15 14 -16 29,	16 32 -34,	16 45 -57,	17 04 -07,
	17 14 -55,	17 57 -18 18,	18 26 -48.	
9 May	16 17 -23,	16 30 -36,	16 38 -17 18,	17 23 -39,
	17 52 -18 21,	18 27 -19 09,	19 13 -31.	
10 May	15 37 -39,	16 24 -28,	16 32 -49,	16 52 -17 29,
	17 33 -46,	17 58 -18 08,	18 09 -25,	18 26 -44,
	18 46 -56,	18 58 -19 15.		
12 May	14 42 -44,	14 46 -15 03,	15 04 -21,	15 23 -36.
15 May	15 21 -30,	15 39 -43,	15 45 -51,	15 53 -16 02,
	16 04 -21,	16 26 -30.		
16 May	15 15 -38,	15 40 -45,	16 50 -17 20,	17 22 -36,
	17 39 -46,	17 48 -18 09.		

Total Coverage : 25^h10^m spread over 12 nights

TABLE Ic

COVERAGE OF EV Lac

Times rounded to the next minute of U.T.

Date			
27 Oct. 1971	16^h29^m-31^m,	16^h43^m-53^m,	16^h55^m-17^h13^m,
	17 16 -33 ,	17 35 -47 ,	17 49 -59 ,
	18 01 -14 ,	18 18 -28 ,	18 30 -19 03,
	19 06 -15 ,	19 16 -18 ,	19 19 -38 ,
	19 45 -49 ,	19 50 -52 .	
2 Nov. 1972	16 10 -19 ,	16 20 -40 ,	16 41 -17 16,
	17 17 -18 03,	18 05 -19 02,	19 03 -19 41.
6 Nov. 1972	16 44 -17 12,	17 16 -27 ,	17 29 -48 ,
	17 52 -18 43,	18 59 -19 30.	
8 Nov. 1972	15 26 -16 30,	16 31 -18 54.	
13 Nov. 1972	15 43 -16 2[illegible],	16 24 -16 51,	17 11 -18 55.

Total Coverage : 14^h33^m spread over 5 nights

FIG. 1

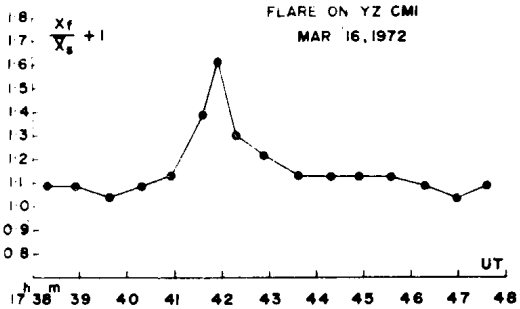

FIG. 2

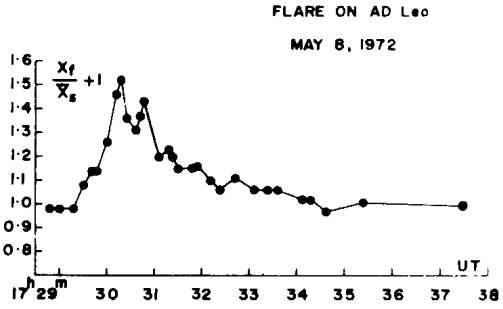

FIG. 3

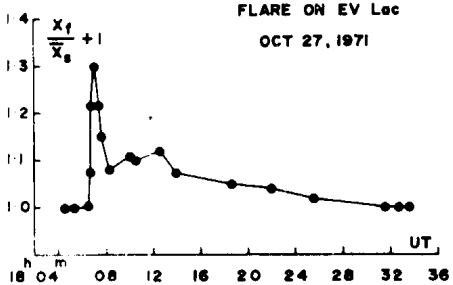

FIG. 4

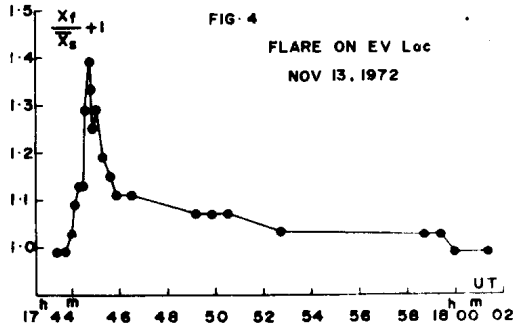

TABLE II

CHARACTERISTICS OF THE FLARES ON YZ CMi, AD Leo AND EV Lac[x]

Star	Magnitude and colour (Erro, 1971)	Date	UT_{max}	Flare duration Before max t_b	Flare duration After max t_a	$\frac{X_{fm}}{\bar{X}s}$	Δm_B	$\frac{\sigma}{\bar{X}s}$	P min	F (z)	Energy released at flare max. (10^{29} ergs/sec)	Excess energy liberated during the event (10^{30} ergs)
YZ CMi	$V=+11^m.20$	16 March 1972	$17^h41^m54^s$	$1^m.6$	$4^m.4$	0.61	0.52	0.006	0.67	1.51	1.75	4.37
	$B-V=+1^m.61$											
AD Leo	$V=+9^m.43$	8 May 1972	$17^h30^m18^s$	$1^m.0$	$4^m.3$	0.52	0.46	0.004	0.90	2.19	7.02	24.81
	$B-V=+1^m.54$											
EV Lac	$V=+10^m.09$	27 Oct. 1971	$18^h07^m09^s$	$1^m.8$	$24^m.6$	0.30	0.26	0.022	1.41	1.28	1.02	6.80
	$B-V=+1^m.36$	13 Nov. 1972	$17^h44^m37^s$	$0^m.9$	$15^m.4$	0.32	0.36	0.005	1.19	1.42	1.12	5.74

[x]Based on notation proposed by Oskanyan (1970).