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REPORT ON THE OBSERVATIONS OF THE FLARE STAR
AD Leo OBTAINED DURING 1969

The results obtained from our photoelectric observations of AD Leo carried out from February, 9 to May, 24 at the Catania Observatory stellar station (Serra La Nave, 1700 m above sea level), are here reported.

The Cassegrain reflectors with photomultiplier + filters combinations utilized are indicated in the following Table:

Telescope (aperture)	Photo- multiplier	Spectral response	Schott filters	Light
30 cm	EMI 6256 A	S 13	GG 14 (2 mm)	v
61 cm	EMI 6256 S	S 13	BG 12 (1 mm) + + GG 13 (2 mm)	b
91 cm	EMI 6256 A	S 13	BG 12 (1 mm) + + GG 13 (2 mm)	b

Considering only once the period of simultaneous observations at different instruments, we have gathered a total combined coverage of 58.4 hours in 18 nights. During this period 10 flares were observed.

No systematic measurements of the comparison star BD +20°2475 were made, but its luminosity was checked with BD +21°2193.

The data referring to the observations made during the international patrol planned by the Working Group on flare stars (Andrews, et al. 1968) have already been published (Cristaldi, et al. 1969), but they were included in this report in order to give all our observed data according

to the standardised one proposed by Andrews, et al. (1969). The light curves of the flares no.1 to no.5 are here omitted because they have been already published on the $(I_{o+f}-I_o)/I_o$ scale (Cristaldi, et al. 1969).

The characteristics of our observations and the obtained data are given in Tables I and II. No transformation equations to the standard UBV system were applied, therefore the b and y lights quoted in the Tables are in our instrumental system. The accompanying Figures show the light curves of the observed flares. Unfortunately, the upper part of the most intense flare (no.10) was lost because the operator could not switch the instrumental sensitivity; therefore, the t_{max} , t_e , $I(m)_{max}$ and P data given in the Table II, are determined from a free-hand extrapolation of the light curve (broken line).

Finally, we should like to point out that in the case of a complex flare light curve (like the one indicated in the Figure as curve no.8-9) we consider the peaks as belonging to independent flares when separated by even a small interval of time during which the $(I_{o+f}-I_o)/I_o$ value drops to zero.

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1969, July 14

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Cristaldi, S., Narbone, M. and Rodono, M. 1969, Comm.27 IAU, Inf.Bull.var.Stars, No.333
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TABLE II

Observed Flares													
M	D	CC	No	Tl	L	t_b	t_{max}	t_e	Δm_{lim}	$I(m)_{max}$	P	sec z	
Feb.	13	132 ^a	1	91	b	21 ^h 26 ^m 9	21 ^h 29 ^m 1	?	+3.7	+2.08	?	1.205	
"	14	46	2	"	"	19 08.0	19 08.8	19 ^h 10 ^m 6	+3.7	+2.25	0.19 ^{min}	2.164	
"	"	"	3	"	"	19 10.0	19 12.2	19 17.0	+3.7	+2.08	0.50	2.138	
"	15	272	4	"	"	20 54.4	20 55.2	21 10.0	+4.2	+1.62	0.57	2.184	
"	"	"	5	"	"	23 25.4	23 25.6	23 31.0	+4.2	+2.12	0.09	1.088	
Mar.	01	483	6	"	"	22 59.0	22 59.9	23 00.0	+3.0	+2.12	0.06	1.051	
Apr.	04	158	7	"	"	01 01.7	01 02.1	01 09.8	+4.4	+1.70	0.31	2.061	
May	01	159	8	"	"	20 44.5	20 44.7	20 45.0	+3.8	+2.00	0.02	1.184	
"	"	"	9	"	"	20 45.1	20 45.3	21 45.5	+3.8	+1.38	0.04	1.185	
"	"	"	10	"	"	21 27.9	21 29.1	22 05.0	+3.8	-1.80	18.78	1.318	

M = month; D = day; CC = combined coverage from different instrument; Tl = cm aperture of telescope; L = light; t_b = UT of the beginning; t_{max} = UT of the maximum intensity; t_e = UT of the end; $\Delta m_{lim} = -2.5 \log(3\sigma/I_0)$, where σ represents the standard noise fluctuation and I_0 represents the intensity of the quiet star; $I(m)_{max} = -2.5 \log [(I_{0+f} - I_0)/I_0]_{max}$; $P = \int (I_{0+f} - I_0)/I_0 dt$ (integrated intensity in minutes).

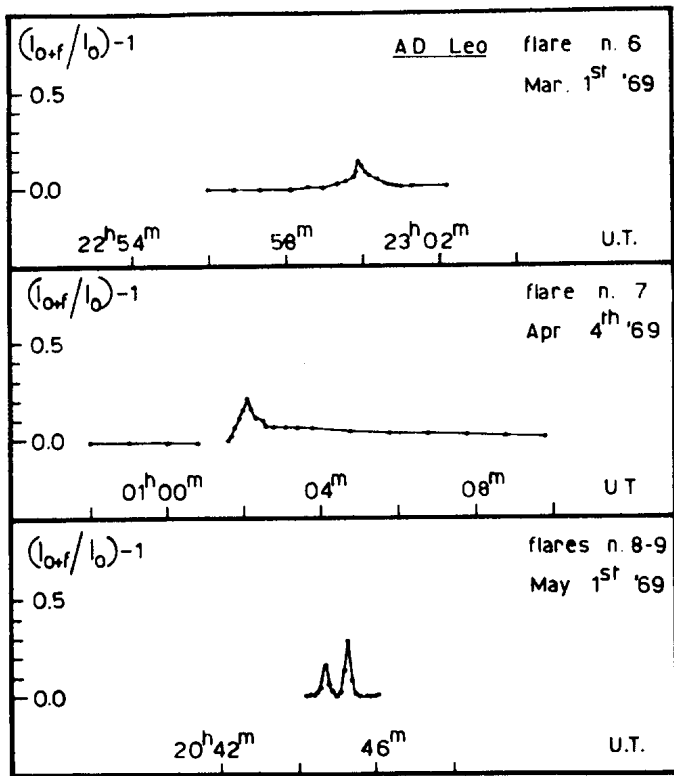


Fig. 1

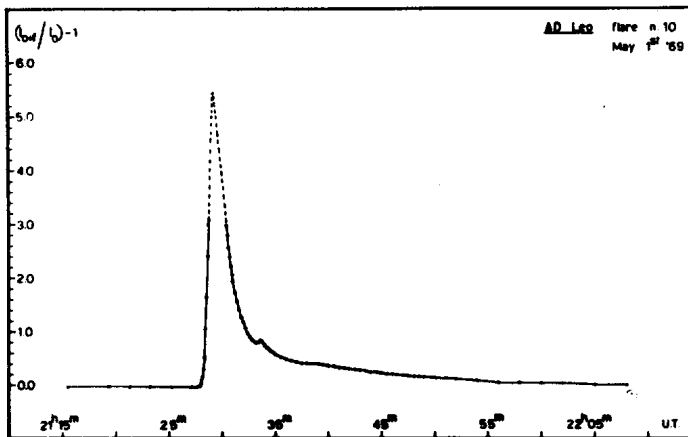


Fig. 2

						TABLE I		
M	L	TI	L	Detailed Coverage (UT)	TC	Δ	lim	CC
Feb.	09	91	b	01 ^h 31 ^m -0255; 0258-0328; 0331-0411; 0413-0454.	195 ^m	+4.62	195 ^m	
Feb.	13	"	"	2008-2142; 2147-2225.	132	+3.68	132	
Feb.	14	"	"	1902-1948.	46	+3.72		
		30	v	1906-1927; 1932-1948; 1958-1959.	38	+4.05	47	
Feb.15-16		91	b	2025-2035; 2037-2205; 2212-2307; 2313-0008; 0013-0044.	239	+4.25		
		30	v	1945-2032; 2042-2046; 2053-2231; 2238-2330; 2339-2349.	211	+4.08	292	
Feb.17-18		91	b	1938-1957; 1959-2035; 2041-2056; 2104-2134; 2136-2147; 2153-2210; 2213-0040; 0045-0139; 0142-0151; 0201-0220; 0224-0349.	442	+4.25	442	
Feb.21-22		"	"	1911-2036; 2038-2134; 2141-0126; 0140-0225; 0228-0300.	443	+4.35	443	
Mar.01-02		"	"	1923-2131; 2133-2218; 2220-0015; 0017-0206; 0209-0226; 0230-0344; 0347-0401.	502	+2.82	502	
Mar.	11	"	"	1951-2111; 2113-2126.	93	+4.48	93	
Mar.	18	"	"	1850-2017; 2022-2057; 2105-2204.	181	+4.40	181	
Mar.21-22		"	"	22 ^h 56 ^m -2319; 2324-0007; 0010-0018; 0021-0051.	104	+4.40	104	
Mar.31-01		"	"	2220-2249; 2251-2318; 2320-2349; 2351-0007; 0012-0055.	144	+3.08	144	
Apr.02-03		"	"	1944-2208; 2210-2302; 2304-2312; 2314-2333; 2335-0015; 0018-0118.	323	+3.58	323	
Apr.03-04		"	"	2216-2234; 2236-2317; 2322-0010; 0014-0034; 0039-0044; 0046-0116.	163	+4.56	163	

TABLE I (cont.)

M	D	Tl	L	Detailed Coverage (UT)	TC	Δ_{lim}	CC
May	01	91	b	2004-2250.	166 ^m	+3.75	166 ^m
May	03	"	"	1941-2003.	22	+3.85	22
May	16	61	"	2028-2103.	35	+3.20	35
May	18	61	"	2009-2027; 2029-2142; 2145-2221; 2223-2301; 2304-2307.	168	+3.08	168
May	24	61	"	2058-2106; 2108-2129; 2132-2133; 2135-2155.	50	+2.62	50

M = month; D = day; Tl = cm aperture of telescope; L = light; TC = total coverage per night; $\Delta_{lim} = -2.5 \log(3\sigma/I_0)$, where σ represents the standard deviation of the random noise fluctuations and I_0 represents the intensity of the quiet star; CC = combined coverage from different instruments.