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SIMULTANEOUS TWO CHANNEL PHOTOELECTRIC
OBSERVATIONS OF EV Lac

The flare star EV Lac has been observed photoelectrically with the 30 cm reflector at the Oslo Solar Observatory, ($\lambda=0^h43^m02^s$, $\phi=+60^\circ12'30''$, $h=585$ m). The observations were carried out in the period from October 7 to October 12, giving a total coverage of 685 minutes. The detailed coverage is given in Table 1.

The monitoring was done with a simultaneous two channel photoelectric photometer. The light is split by a dichroic mirror, wavelengths shorter than 5000 \AA are registered by an EMI 9698 BG cell wavelengths longer are measured with a RCA C31034 cell. The blue measurements were performed through a Schott BG12 filter (see Andersen and Pettersen 1975 for further description). Combined with a Schott RG630 filter the red cell gives a flat spectral response from 6400 \AA to 8600 \AA . Thus it includes both H α and the Ca II triplet at 8500 \AA .

During the monitoring two definite and one suspected event were observed, the physical properties of the definite events are given in Table 2.

In flare no.1 there are several interesting details to be noted. In the blue channel it seems as if the postflare intensity has dropped below the preflare level. It does not reach the original level during the rest of this night. Furthermore there is a decrease (dip) in the intensity below the preflare level in the red channel immediately before the outburst. This dip in the red channel is associated with a decrease in the blue channel. Both the previously mentioned properties can possibly be explained if there is a significant contribution to the total intensity in both channels from line features.

The postflare decrease is then caused by an overall decrease in the blue emission lines, (Balmer and Ca II lines). The preflare dips must be caused by a short time overpopulation of the lower

levels in the dominating transitions. These dips and the following outbursts may be caused by the passage of a shock front through the emitting medium.

In flare no.2 it worth noting that there is no detectable increase in the red channel during the outburst in the blue one.

The suspected outburst occurred October 10 approximately 20h37^m, the maximum intensity in blue was less than 0.1.

Table 1. Detailed Coverage of EV Lac

7/10-1975	1851-1858 ($\sigma_b=.1, \sigma_r=.02$), 1903-1931 ($\sigma_b=.08, \sigma_r=.02$)
	1933-1948 ($\sigma_b=.08, \sigma_r=.02$), 2005-2020 ($\sigma_b=.09, \sigma_r=.02$)
8/10	1850-1910 ($\sigma_b=.06, \sigma_r=.01$), 1913-1944 ($\sigma_b=.05, \sigma_r<.01$)
10/10	1928-1951 ($\sigma_b=.07, \sigma_r=.02$), 1958-2019 ($\sigma_b=.05, \sigma_r=.01$)
	2028-2050 ($\sigma_b=.06, \sigma_r=.01$), 2103-2232 ($\sigma_b=.06, \sigma_r=.01$)
11/10	1914-2018 ($\sigma_b=.08, \sigma_r=.02$), 2022-2043 ($\sigma_b=.08, \sigma_r=.02$)
	2047-2051 ($\sigma_b=.09, \sigma_r=.02$), 2108-2126 ($\sigma_b=.08, \sigma_r=.02$)
	2158-2332 ($\sigma_b=.05, \sigma_r=.02$)
12/10	1847-1852 ($\sigma_b=.10, \sigma_r=.03$), 1900-1954 ($\sigma_b=.10, \sigma_r=.02$)
	2022-2036 ($\sigma_b=.06, \sigma_r=.01$), 2100-2122 ($\sigma_b=.08, \sigma_r=.02$)
	2124-2220 ($\sigma_b=.07, \sigma_r<.01$), 2226-2252 ($\sigma_b=.07, \sigma_r=.01$)
	2256-2300 ($\sigma_b=.05, \sigma_r=.01$)

Table 2. Flare Characteristics

Flare no.	Colour	Date 1975	t_{start}	t_{max}	t_{end}	$\frac{I_{0+f}-I_0}{I_0}$	P sec.	σ/I_0
1	b	7/10	1923	192507	1933	>0.8	75	0.07
	r		1925	192507	1928	>0.07	6	0.02
2	b	11/10	2206	220707	2209	0.24	14	0.05
	r		-	-	-	<0.02	-	0.02

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References:

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