

ELECTROPHOTOMETRIC OBSERVATIONS OF THE EV LAC FLARES IN U, H α AND H β

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ABSTRACT. Results of the patrol observations of the EV Lac flares in U, H α and H β bands are given. The observations are carried out simultaneously in U and H α or in U and H β . During (U,H α) observations 21 U-flares are registered of which only comparatively strong one is accompanied by a real H α -flare. And during (U,H β) observations among 7 U-flares the strongest and a "slow" one is accompanied with an increase of H β -signal. Small amplitude periodic light variations of EV Lac are detected with a period of 3^d.3 and amplitude 0^m.02 in B and V bands.

1. INTRODUCTION

It is difficult to interpret the correlations between the photometric characteristics of the flares observed in the continuum and in the spectral lines. In 1979-1980 and 1985 during 145.5 hours the patrol U,H α and H β observations of EV Lac was organized. H α and H β interference filters with 12A and 6A of FWHM correspondingly were used. The observations were made by the 48-cm cassegrain telescope of the Byurakan Astrophysical Observatory in the analogue system. Using the results of the simultaneous spectral and photoelectric observations of the flares of AD Leo, made by Gershberg and Chugainov [1], the expected amplitudes of the H α and H β flares for our instrumental photoelectric system were estimated. The values of 0^m.4 and 0^m.8 were calculated for the H α and H β flares correspondingly.

2. OBSERVATIONS

21 U flares during the 72.2 hours of (U,H α) observations were registered. The increase of H α -signal was registered in 4 cases, but only one of them was reliable, i.e. only one of 21 U-flares was accompanied by reliable H α flare, with

amplitude $0^m.3$. Probably only the most powerful U-flares were accompanied with the increase of $H\alpha$ -signal. 7 U-flares during the 40 hours of (U, $H\beta$) observations are registered. The increase of $H\beta$ -signal in only one case is registered. The duration of increased $H\beta$ -signal was as long as 45 min.

To search the small-amplitude variability of EY Lac observed from 10.08.85 to 14.10.85 during 24 nights 64 UBV measurements were made. It is probable the variability of EV Lac with the period of $3^d.3$ and amplitude of $0^m.02$.

3. DISCUSSION

28 U-flares during U, $H\alpha$ and $H\beta$ observations were registered. The shapes of the light-curves of the flares confirm the idea about the complexity and multiple behaviour of flare phenomenon. The increase of the $H\alpha$ and $H\beta$ signals was registered during only most powerful U-flares. Especially we would like to mention the flare illustrated in Fig.1, which was accompanied with the increase of $H\beta$ signal. This flare is the most powerful and has a small velocity of increase. It seems, that this event confirms Ambartsumian's idea [2], that the energy of a slow flare is liberated in the dipper layers of the star atmosphere.

Our observational evidence establishes, that $12A$ of FWHM is much wide for the $H\alpha$ filter to discover $H\alpha$ flares on the flare stars. The discussion of $H\beta$ observations becomes impossible because of low sensitivity of our equipment.

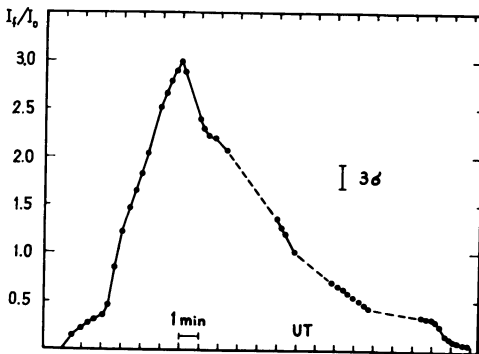


Figure 1. Flare light curve of EV Lac 27-Aug-1985.

REFERENCES

1. Gershberg, R.E. and Chugainov, P.F. (1966) 'Photoelectric and spectrographic observations of flares on AD Leo in 1965', *Astron. J.*, 43, 1168-1178.
2. Ambartsumian, V.A. (1971) 'Fuors', *Astrofizika*, 7, 557-572.