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UBVRI PHOTOMETRY OF SOUTHERN ACTIVE CHROMOSPHERE STARS\*

During the past few years the active chromosphere stars received much attention because of the variety of extraordinary phenomena exhibited by them. Since the majority of these interesting objects lies north of  $-40^{\circ}$  declination, the discovery of the new bright southern active stars is an important task. Based on medium dispersion spectra, the selection of the potential southern active chromosphere candidates was done by several authors: Bidelman and MacConnell (1973), Weiler and Stencel (1979), Hearnshaw (1979), Bopp and Hearnshaw (1983). In all these papers the most important criterion for chromospheric activity was the abnormally strong emission in absorption lines of Ca II H and K and/or H  $\alpha$ . As the majority of the known chromospheric active stars shows intrinsic small amplitude light variations (up to 0.3 mag) we have undertaken a photometric program for searching for new active stars. Based on the above mentioned candidate lists we have chosen six stars for which, as we know, photometry has not yet been done (except for two observations of HD 155555 - Eggen, 1978). We have selected stars showing extremely strong H and K Ca II and/or H  $\alpha$  - emission, which suggest good chances for finding optical variability (in analogy to the well known northern RS CVn systems like HR 1099 or UX Ari). In this paper we present very preliminary results of UBVRI photometry of chosen stars.

The observations were carried out at the European Southern Observatory at La Silla, during 12 consecutive nights from 13 April 1984 on. The ESO 50 cm telescope equipped with single beam photometer housing the RCA 31034 gallium-arsenide photomultiplier in conjunction with a standard UBVRI set of filters as described by Bessel (1979) was used. The observations were made differentially; absolute photometry of the comparison stars was obtained during 9 nights under the best weather conditions. During these nights at least 30 standards were observed to tie in the comparison stars to the

\* Based on observations collected at the European Southern Observatory, La Silla, Chile

standard UBVR system. The constancy of the main comparison was checked several times per night during the first few nights and at least two times later, when it was realized that they are stable. The standard errors for a single observation are  $0.015$ ,  $0.008$ ,  $0.007$ ,  $0.008$ ,  $0.005$  for the UBVR colour bands, respectively.

Table I

Summary of the UBVR photometry of the southern active chromosphere stars

Object	Sp*	Main Comparison	Secondary Comparison	Variability	V Ampl. (mag)	Remarks
HD 86005	K2IIIp	HD 86034	HD 85849	NO	-	1
HD 102077	K0/IVp	HD 102076	HD 102202	FOUND	0.08	
HD 119285	KIVp	HD 119164	HD 119076	?	<0.03	2
HD 127535	K1IV/Ve	HD 128227	HD 128618	FOUND	0.24	
HD 139084	K0V	HD 139070	HD 139002	FOUND	0.11	
HD 155555	KIVp	HD 156427	HD 154775	FOUND	0.08	

\* According to Houk and Cowley (1975) and Houk (1978).

Remarks:

- Mean colours:  $V=7.230$   $B-V=1.307$   $U-B=1.026$   $V-R=0.711$   $V-I=1.347$   
m.e. .005 .007 .011 .003 .005
- Variability possible, but with the period longer than duration of our run ( $12^d$ ).  
Mean colours:  $V=7.856$   $B-V=1.092$   $U-B=0.831$   $V-R=0.636$   $V-I=1.241$   
m.e. .017 .007 .015 .005 .010

Evidence for photometric variability was found for 4 stars from our sample. In Table I we list the summary of our observations, i.e. HD number of objects and comparisons. For the found variability we also give the V amplitudes and for the remaining stars all colours. The more detailed analysis and light curves will be published in forthcoming papers.

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