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POLARIMETRY OF R CORONAE BOREALIS TYPE STARS AND RELATED OBJECTS

During the 1988-89 period polarimetric observations of some R Coronae Borealis type stars (RCB), several hydrogen-deficient carbon stars (HdC) and related objects were obtained with the 60-cm reflectors of Soviet - Bolivian Observatory Santa Ana (Tarija, Bolivia) and Middle Asia Expedition of the Main Astronomical Observatory of the Academy of Sciences of Ukrainian (Mount Maidanak, Uz.SSR) using a spectrophotopolarimeter (Bugaenko and Guralchuk, 1985) and standard UBVR filters.

The observations are given in Table I. From left to right the data tabulated are: star name, the epoch of observations in Julian date, the colour-excess E(B-V), percentage polarization P and position angle θ and their standard errors in the bands U,B,V,R and integral light (Int.) respectively.

UBVR photometric observations were also obtained for several stars. The results are given in Table II. The typical photometric errors are about $0^{m}.01$ in V, $0^{m}.02$ in (B-V), $0^{m}.03$ in (U-B) and $0^{m}.02$ in (V-R). All the stars were at the maximum brightness or near it.

A detailed analysis of the results of polarimetric observations of RCB and related stars show absence of the intrinsic polarization at the maximum light and when weakening of brightness is about 2 mag. Thus, the polarization has interstellar origin. From here we evaluated the colour-excesses of these stars (Allen,1977). They are comparable to values found by Rosenbush (1982) for some stars using intrinsic colours (in Table I values E(B-V) in the brackets are from Rosenbush (1982)). Following Rosenbush (1982) we added and defined more precisely the position of the studied stars on the Hertzsprung-Russell diagram (Rosenbush, 1986).

UW Cen should be attributed to group I of stars (UV Cas, V CrA, R CrB, RY Sgr, SU Tau and members of LMC); AE Cir belongs to group II (S Aps, U Aqr, WX CrA, RT Nor, SV Sge, GU Sgr, RS Tel). However, according to Kilkenny (1989), AE Cir should be excluded from the list of R CrB stars. Y Mus has to be displaced in the region of extreme helium stars, near MV Sgr.

Table I

Name	JD 2440000+	E(B-V)	U P%, θ°	B P%, θ°	V P%, θ°	R P%, θ°	Int. P%, θ°
				RCB			
S Aps	7568.8	0.10 (<.13)	-	-	0.9±0.2 64±6	-	-
	7600.7		-	-	.9±.3 67±9	-	-
U Aqr	7834.1	.06	-	-	.5±.2 158±8	-	-
UV Cas	7832.4	.4 (.66)	-	-	3.5±.2 56±1	-	-
	7833.2		-	-	3.7±.2 58±1	-	-
UW Cen	7507.8	.14	-	-	-	-	1.2±.4 56±10
DY Cen	7568.8	.15	-	-	-	-	1.3±.8 57±6
AE Cir	7623.8	.07	-	-	-	-	.6±.4 49±18
V482 Cyg	555.5	.31*	-	-	2.8±.1 36±1	-	-
V CrA	7411.6	.04 (.05)	-	-	.3±.4 162±12	-	-
	7600.8		-	-	.5±.2 172±11	-	-
WX CrA	7600.8	.11 (.05)	-	-	1.0±.2 164±6	-	-
Y Mus	7647.6	.27	-	-	2.4±.1 85±2	-	-
RT Nor	7600.8	.14 (.2)	-	-	1.2±.2 36±5	-	-
RY Sgr	7348.5-7438.5	.06 (.06)	.50±.28 176±16	.54±.07 180±4	.47±.07 179±4	.42±.12 174±8	-
MV Sgr	7623.9	.15	-	-	-	-	1.3±1.1 172±8
				CW			
RU Cam	7205.2	.05	-	.24±.12 69±14	.42±.07 72±5	.35±.08 73±6	-
V553 Cen	7614.8	.02	-	-	.1±.2 168±94	-	-
				EB			
nu Sgr	7624.9	.10	.60±.10 173±5	.90±.18 174±2	.82±.06 167±2	.85±.06 174±2	-

Table I (cont.)

Name	JD 2440000+	E(B-V)	U P%, θ°	B P%, θ°	V P%, θ°	R P%, θ°	Int. P%, θ°
				HdC			
HD137613	7644.6	.08	-	.64±.10 78±4	.80±.10 62±4	.39±.10 76±7	-
				Unique			
V348 Sgr	7624.8	.24	-	-	-	-	2.2±.3 149±4
rho Cas	7834.2	.16	1.51±.14 62±3	1.26±.06 57±2	1.36±.02 53±1	1.32±.06 51±1	-

* - Observations were obtained together with N.N. Kiselev at the 1-m telescope of the Institute of Astrophysics of the Academy of Sciences of Tadzhik SSR.

Table II

Name	JD 2447000+	V	B-V	U-B	V-R
U Aqr	839.3	$11^m.04$	$^m.96$	-	$^m.87$
RY Sgr	351.7	6.50	.75	$^m.21$	.55
	371.6	6.19	.47	-.17	.42
	372.7	6.18	.51	-.14	.42
	380.7	6.44	.70	.13	.63
	640.8	6.13	.51	-.03	-
	647.9	6.27	.66	.07	-
SV Sge	839.3	11.93	2.20	-	1.88
HD 182040	372.7	6.94	1.05	.49	.83

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