COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
NUMBER 742

Konkoly Observatory
Budapest
1972 November 27

POLARIMETRIC OBSERVATIONS OF R CORONAE BOREALIS

Multicolour polarimetric observations of R CrB were carried out in April-June and August-September, 1971, and in June, 1972. In 1971 the star was in quiet state (maximum brightness), and during the 1972 period of our observations it was in minimum (at the stage of rise of the brightness, 3 months after the beginning of the active phase). Measurements have been made on the 70 cm reflector at the Main Astronomical Observatory of the Ukrainian Academy of Sciences and on the 122cm reflector at the Crimean Astrophysical Observatory with the photoelectric polarimeter built at Kiev (Bugayenko et al. 1968). The method of observations and reduction is similar to that described by us earlier (Kolotilov, Orlov and Rodriguez, in press). The standard errors of the values $p \cos 2\theta$ and $p \sin 2\theta$ (p is the amount of polarization, and θ is the position angle of the plane of vibration) are 0.02 - 0.06%. The filters used for observations during maximum brightness had the following band halfwidths: 300A for λ3730; 650A for λ7650; 120-200A for other (interference) filters. During the minimum wide filters with halfwidths of 650-800A were used.

The results are given in the Table. The value of polarization of R CrB at maximum brightness is in good agreement with the data by Serkowski and Kruszewski (1969) obtained in January-March, 1968 in the UBV system, as well as with the Behr's catalogue (Behr 1959) where values of p and θ are given for a wide spectral band, 3500-6000A. These values are also represented in the Table. There are no other polarimetric observations of R CrB in the phase of minimum brigthness to be compared with.

Comparison of polarization of R CrB at maximum with that of a neighbour star HD 141352 (Sp F2) at the distance of 21' from R CrB (0.18% and 0.16% respectively, according to our observations in integral light) seems to suggest this polarization to be of interstellar origin. The observed increase of polarization and change of position angle, as well as the character of wavelength dependence of polarization at minimum indicate the appearance of intrinsic polarization during the active phase of the star.

Date	Phase	λ,A	p,%	θ,degr.	Remarks
Between 1956 and 1958	maximum	4600	0.26	131	Behr, 1959
Jan.-Mar.1968	"	U	0.17-0.22	6;53	Serkowski,
		B	0.09-0.19	95-111	Kruszewski,
		V	0.10-0,24	108-110	1969
June 1971	maximum	4120	0.10		70cm refl.
		4500	0.18		Kiev
		5040	0.32		
		6220	0.30		
		7200	0.15		
Aug.-Sept.1971	"	3730	0.11	70.8	122cm refl.
		4120	0.16	78.1	Crimea
		4500	0.18	89.9	
		5040	0.17	86.9	
		5440	0.18	91.4	
		5960	0.19	96.5	
		6220	0.22	85.5	
		6530	0.16	86.8	
		6880	0.30:	96.5	
		7650	0.18	89.3	
June 5/6-10/11 1972	rise of bright-ness (~$8^m.7$-$8^m.2$vis)	3900	0.78	135.0	70cm refl.
		4900	0.45	132.6	Kiev
		5900	0.41	144.4	
		7650	0.21	132.8	

Main Astronomical Observatory
of the Ukrainian Academy of Sciences
Goloseevo, Kiev 252127
USSR

M.Ya.ORLOV
M.H.RODRIGUEZ

References:

Behr,A., 1959, Veröff.Univ.Sternwarte Göttingen,No.126.

Bugayenko,L.A.,Bugayenko,O.I.,Krugov,V.D.,Parusimov,V.G., 1968,Astrometrica y Astrofisica,1,193,Kiev,Naukova Dumka Press.

Kolotilov,E.A,,Orlov,M.Ya.,Rodriguez,M.H.,Astr.Zhurnal(in press).

Serkowski,K.,Kruszewski,A.,1969,Astrophys.J.155, L15.