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**PHOTOMETRIC AND POLARIMETRIC OBSERVATIONS  
OF 17 DOUBLE AND MULTIPLE STARS**

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We have performed a photometric and polarimetric monitoring of 17 double and multiple stars within the framework of scientific cooperation between the Byurakan Observatory (Armenia) and Observatory “Ramon Maria Aller” (Spain).

The observations have been made with the photopolarimeter attached to the AZT-14 50-cm telescope of Byurakan Observatory during January–July of 1997. This photopolarimeter works in the regime of intensification of the direct current. It can be used either as a photoelectric photometer (without the polaroid) or as a photopolarimeter (with a polaroid). The maximum sensitivity of the used photomultiplier lies in the wavelength interval 4000–4400 Å. The observations have been done in the U, B, V, R bands. A more detailed description of the method and instruments has already been given by Eritsian & Nersisian (1984).

In Table 1 (i) the name of star, (ii) the period of observations, (iii) the mean value of magnitudes in U, B, V, R bands and (iv) the number of photometric and polarimetric measurements are presented.

The first 4 stars in Table 1 are components of known long period variables. The separation between the primary stars and their comparison are between 46 and 208 arcseconds (Proust *et al.* 1981). For these four stars only photometric observations have been done.

The preliminary analysis of photometric and polarimetric observations of these 17 stars allows to detect light variations of two of them (SAO 64769 and SAO 87297) and intrinsic light polarization of SAO 88631. For some other observed stars the light variation can be suspected only: the amplitude of light variation of these stars is less than  $3 - 5 \sigma$ . For 16 observed stars the degree of light polarization is less than 0.3 %.

The results of photometric observations for the stars SAO 64769 and SAO 87297 are presented in Table 2. The columns of Table 2 respectively give: (i) the name of the star, (ii) the date of observation, (iii) the observed magnitude in the U, B, V, R bands and (iv) the photometric uncertainties of measurements in U, B, V, R bands.

As one can see from the data given in Table 2 a real light variation of these two stars is detected.

In Table 3 the results of polarimetric observations of the star SAO 88631 are presented. The uncertainties in the polarimetric measurements are  $\sigma_{P,(UBVR)} = 0.1 - 0.2 \%$ ,

Table 1: Data of programme stars

Star	Observing period 1997	Mean magnitude				n
		U	B	V	R	
R Gem (comp.)	13.01–12.02	–	10.85	10.91	–	10
S Ori (comp.)	13.01–31.01	–	8.68	8.05	–	5
R Aur (comp.)	13.01–12.02	–	9.74	8.52	–	9
U Cam (comp.)	13.01–12.02	–	9.37	9.07	–	9
SAO 64769	12.03–13.05	4.18	4.00	4.21	5.00	12
SAO 78155	13.03–14.05	8.97	8.96	9.98	9.00	11
SAO 79804	12.03–14.05	–	8.11	7.50	6.95	9
SAO 82650	13.03–12.05	7.25	6.42	6.08	6.22	
SAO 45051	18.03–07.05	–	10.85	10.02	10.32	2
SAO 78407	18.03–07.05	–	8.04	8.04	8.60	2
AGK 191058	29.05–13.07	–	7.83	7.74	8.05	15
SAO 64000	12.05–31.05	–	10.25	9.82	9.74	6
SAO 66759	29.05–13.07	–	9.22	9.22	9.59	16
SAO 87297	30.05–10.07	–	8.89	8.97	9.56	7
SAO 88631	05.06–12.07	–	7.14	6.90	7.41	8
SAO 107425	13.06	–	5.34	5.42	6.01	1

Table 2: Photometric observations of SAO 64769 and SAO87297

Star	Date	Brightness [m]				$\sigma$ [m]			
		U	B	V	R	U	B	V	R
SAO 64769	12.03.97	4.21	4.05	4.35	4.95	0.02	0.01	0.01	0.02
	14.03.97	4.18	3.99	4.25	4.90	0.02	0.01	0.01	0.02
	16.03.97	4.22	4.01	4.25	4.93	0.02	0.01	0.01	0.02
	18.03.97	4.20	4.02	4.25	4.96	0.02	0.01	0.01	0.02
	19.03.97	4.16	4.00	4.25	4.90	0.02	0.01	0.01	0.02
	05.05.97	4.16	4.00	4.25	4.90	0.02	0.01	0.01	0.02
	06.05.97	4.25	3.91	4.21	5.12	0.02	0.01	0.01	0.02
	09.05.97	4.07	4.12	4.17	4.97	0.02	0.01	0.01	0.02
	10.05.97	4.00	4.06	4.21	4.97	0.02	0.01	0.01	0.02
	11.05.97	4.31	4.04	4.22	5.18	0.02	0.01	0.01	0.02
	12.05.97	4.25	3.82	3.99	5.01	0.02	0.01	0.01	0.02
	13.05.97	4.17	3.95	4.07	5.07	0.02	0.01	0.01	0.02
	SAO 87297	30.05.97	–	8.75	8.85	9.45	–	0.02	0.02
01.06.97		–	8.73	8.85	9.45	–	0.02	0.02	0.03
03.06.97		–	8.75	8.85	9.45	–	0.02	0.02	0.03
05.06.97		–	8.78	8.90	9.50	–	0.02	0.02	0.03
09.06.97		–	8.80	8.91	9.50	–	0.02	0.02	0.03
08.07.97		–	9.19	9.20	9.80	–	0.02	0.02	0.03
10.07.97		–	9.22	9.25	9.81	–	0.02	0.02	0.03

Table 3: Polarimetric observations of SAO 88631

Date	P [%]				$\theta$			
	U	B	V	R	U	B	V	R
05.06.97	1.5	0.7	0.4	0.6	2	1	2	178
07.06.97	1.3	0.8	0.4	0.5	2	1	2	178
10.06.97	1.4	0.6	0.4	0.7	3	1	2	177
12.06.97	1.3	0.7	0.3	0.7	2	2	3	177
13.06.97	1.4	0.7	0.4	0.7	2	1	2	178
08.07.97	1.5	0.7	0.4	0.6	2	1	2	178
11.07.97	1.4	0.7	0.5	0.6	2	2	3	178
12.07.97	1.4	0.6	0.4	0.7	2	1	2	177

$\sigma_{\theta,(UBVR)} = 1 - 2$  degrees. Such values of uncertainties in determination of the degree of light polarization allows to detect the light polarization only higher than 0.3 – 0.5 %. For the other 16 stars no light polarization has been detected. In any case their polarization is smaller than 0.3 – 0.5 %.

Table 3 gives the following data: (i) the date of observations, (ii) the observed degree of the light polarization (%) in the U, B, V, R bands and (iii) the angle  $\theta$ . The wavelength dependence of light polarization of SAO 88631 and the absence of light polarization for the observed background stars show, that the detected light polarization has intrinsic character. It is a direct evidence of the existence of a circumstellar envelope near the star SAO 88631.

The study of photometric and polarimetric observations of the stars given in Table 1 in more detail will be done later.

#### References:

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