	m
for photovisual magnitudes:	±0.06
for color-indices:	±0.14
the mean error of arithmetical mean (*M*)	
— for photographic magnitudes:	±0.06
for photovisual magnitudes:	±0.04
for color-indices:	±0.07.

For separate Areas ρ', m and M of color-indices get the values given in Table IV.

In Table V we give the list (Catalogue) of color-indices of 3219 stars in KSA 10, 17, 20, 21, 22, 26, 38; 42 and 43.

Table VI contains the comparison of Kanobili photographic magnitudes with those of BSD and of Mount Wilson. The differences $m_{Kb}-m_{Gr}$ somewhat differ from those which we have in the first two papers, although our (Kanobili) magnitudes are as before systematically fainter than the Groningen ones. The differences $m_{Kb}-m_{MW}$ coincide with those given in the previous paper, though they take rather different values for different Areas. Generally, the data of Tables II, III, IV and VI show that the material of this article is uniform with the material of the previous articles both in choosing the stars and in accuracy of determinations.

On the basis of the material given in Table V we obtained Table VII which contains the average values for the color-indices of the stars in each Area, subdivided according to spectral types and apparent magnitudes. This Table serves as a basis for computations of selective absorption in space. We postponed corresponding analysis untill we have obtained the ultimate reduction material. We should like to note only that the coefficient of selective absorption and the optical thickness of the galactic absorbing layer take values consistent with the data of the previous papers.

November, 1944.

ᲐᲑᲐᲡᲗᲣᲛᲐᲜᲘᲡ ᲐᲡᲢᲠᲝᲤᲘᲖᲘᲙᲣᲠᲘ ᲝᲑᲡᲔᲠᲕᲐᲢᲝᲠᲘᲘᲡ ᲑᲣᲚᲔᲢᲔᲜᲘ № 8. 1945
БЮЛЛЕТЕНЬ АБАСТУМАНСКОЙ АСТРОФИЗИЧЕСКОЙ ОБСЕРВАТОРИИ № 8. 1945
BULLETIN OF THE ABASTUMANI ASTROPHYSICAL OBSERVATORY No. 8. 1945

ON THE DEGREE AND DIRECTION OF THE PLANE OF POLARIZATION IN THE STREAMERS OF THE SOLAR CORONA AND IN THE REGIONS FREE OF THEM ACCORDING TO THE OBSERVATION OF THE TOTAL SOLAR ECLIPSE OF SEPTEMBER 21, 1941

M. A. VASHAKIDSE

We published in the previous issue of our Bulletin[1] the results of our general investigation of the polarization of the solar Corona observed at the total eclipse on the 21-th of September, 1941.

The present note contains the results of additional measurements of the degree and direction of the plane of polarization in the streamers of the solar Corona as well as in the regions free of them. The study of the degree and direction of the plane of polarization of the Corona in both its above mentioned regions represents special interest in connection with the study of the shape and physical nature of the coronal rays.

The measuring of the rays of Corona and its other details requires special treatment. I was forced to perform my measurements using the objective photoelectric microphotometer, although it would have been much better to measure the negatives on selfrecording microphotometer that would have given us the possibility of introducing into the formulae (7a) and (7b) of our previous paper the values a, b and c exactly corresponding to the same coronal points. We have used all the negatives present for the photographic rays as well as for the visual ones. On each negative we measured 15 radii, 8 of them along the coronal rays and 7 between the rays. In the first case we measured along the whole length of the ray taking in view its maximum intensity and for the rays inclined to the equator the measurements were made along the preliminary drawn lines. Each plate was measured twice and the arithmetical mean was taken as a result of measurements. The corresponding mean quadratic error is $\pm 8\%$. The results of measuring and computations are represented in Table I.

Table I contains the values of the degree of polarization in per cent for the photographic and photovisual rays in the regions with streamers separately from the regions free of them. These values are ranged according to the distances from the solar limb expressed in minutes of arc and to the position angles of the measured radii. The maximum polarization for the photographic as well as for the photovisual rays is at the distance $\rho=12'$ from the

TABLE I ცხრილი

φ \ ρ	7′		10′		12′		16′		21′		26′		31′		36′	
	ph	pv	ph	pv	ph	pv	ph	pv	ph	pv	ph	pv	ph	pv	ph	pv
In streamers სხივებრი უბანი																
225°					47	42	38	27	28	26	24	45	13	26		
312			66	—	68	37	46	42	34	32	26	31	18	27		
300	54		51	40	54	45	43	42	—	38	28	41	19	42	14	
290	54		53	52	43	46	35	45	28	40	20	37	18	28	20	
266	26		20	59	30	53	18	—	16	42	14	59	6	41	11	34
258	17		—	—	15	53	14	53	14	42	12	45	12	43	8	22
250	16		7	51	13	50	12	46	12	38	8	41	—	38	7	33
76	8		8	53	11	52	8	43	11	39	9	—	8	—	—	—
Mean საშუალო	29		28	51	33	63	31	43	21	37	19	43	16	35	13	30
In regions free of streamers არასხივებრი უბანი																
1	40		31	8	30	12	25	18	—	15						
318	57		—	—	65	32	48	40	41	31	24	17	17	40	—	45
308	—		—	55	—	32	38	40	31	34	26	33	17	—	12	39
295	—		51	55	35	57	29	43	23	47	19	36	22	28	22	22
262	18		19	56	16	55	21	52	12	54	11	42	10	42	9	36
254	16		24	57	28	55	13	—	10	40	8	39	7	56	—	39
80	11		6	41	6	42	10	41	11	35	8	30	8	22	—	—
Mean საშუალო	29		26	45	30	41	26	39	21	37	16	33	14	38	14	36

solar limb in accordance with the data previously received by us for the equatorial coronal region. The degree of polarization in the streamers is somewhat more than in the regions free of them although this difference is not great. The difference is more noticeable within the limits of $\rho = 16'$.

The measured radii were chosen mostly in the equatorial coronal region namely there, where the streamery structure is better seen. This case explains the mentioned accordance with the previous data pertaining to the equatorial region.

Besides the degree of polarization we determined also the rotation of the plane of polarization along the same radii on the base of the formula (7b) of the previous paper. The results are given in Table II which is arranged in the same way as the first one, but refers only to the photographic rays.

In the rotation of the plane of polarization there is no marked difference between the coronal regions with and without streamers. The majority of directions shows that the plane of polarization is oriented radially. But the directions corresponding to $\varphi = 262°$, 258°, 254°, 250°, 80° and 76° have a noticeable positive rotation and at the same time somewhat more in the region of streamers. We received for the photovisual rays almost the same picture and therefore we found the data given for the photographic rays quite sufficient.

TABLE II ცხრილი

φ \ ρ	6′	7′	10′	12′	16′	21′	26′	31′	36′
In streamers სხივებრი უბანი									
325°				−23°	−26°	−21°	−23°	−22°	
312			−13°	− 8	− 8	− 7	− 2	− 7	
300	−12°	− 7°	− 8	− 9	− 7	− 3	− 3	− 4	
290	−23	−21	−21	−16	−19	−18	−19	− 8	
266	+18	+28	+34	+28	+38	+32	+33	+31	+20°
258	+26	—	+24	+31	+40	+43	+39	+41	+13
250	+30	+20	+48	+58	+55	+53	—	+50	+56
76		+40	+36	+37	+37	+50	+50		
In regions free of streamers არასხივებრი უბანი									
1	− 5	+ 4	−9	−10	−18	−18			
318		−14	—	−15	−17	−17	−20	−22	
308					− 6	− 3	0	− 1	
295			+21	+19	+19	+17	+17	+18	+19
262	+22	+34	+21	+31	+30	+31	+20	+24	+28
254	+27	+18	+27	+28	+38	+38	+42	+35	+38
80				+40	+32	+41	+44	+37	—

We must say that we didn't discover any noticeable rotation of the plane of polarization, although we might expect it taking in consideration the presence of the magnetic properties of the coronal streamers.

Finally we tried to examine the law of the intensity decrease with distance from the solar limb although it is true that our negatives were not quite suitable for this purpose due to their comparatively small scale. The intensity decrease with distance is expressed by the formula $I = \frac{a}{h^n}$, where h is the distance of the given coronal point from the solar limb, a—a certain constant, n—exponent, which, necessary to notice, greatly changes from one eclipse to the other. According to Н. Н. Парийский[3] n is near 2. On the plates taken in visual rays, we have chosen four radii with the planes of polarization coinciding with the position of the polarization plane of the analyser and 4 other radii displaced at 90° relatively to each of the first four radii. Thus the first radii give us the greatest number of polarized coronal rays and the second—the least. Further, making use of measured intensities and corresponding distances from the solar limb and allowing $n = 2$ we computed a for all the four radii. The results of computations show that a for different radii do not differ remarkably from one another but at the same

time a is greater for the first group of radii than for the second one, as we can see from the Table III.

TABLE III ცხრილი

φ	120°	123°	300°	303°	30°	33°	210°	213°
a_1	162	155	140	138				
a_2					136	133	140	137

Table III is based on the data received from one plate. We found it quite sufficient to the purpose as the two others gave us similar results.

Generally it may be concluded that n is greater for the polarized than for the nonpolarized rays of the Corona.

January, 1944.

LITERATURE: ლიტერატურა:

1. Bull. Abast. Obs. No. 7, p. 1, 1943.
2. Успехи Астр. Наук, стр. 167, 1939.

პოლარიზაციის ხარისხისა და სიბრტყის მიმართულების განსაზღვრა მზის კორონის სხივებრ და არასხივებრ უბნებში 1941 წლის 21 სექტემბრის მზის სრული დაბნელების დაკვირვების საფუძველზე

მ. ვაშაკიძე

(რეზიუმე)

მზის კორონის პოლარიზაციული თვისებები ჩვენ დაწვრილებით შევისწავლეთ[1] 1941 წლის 21 სექტემბრის მზის სრული დაბნელების დაკვირვების ფოტოგრაფიული მასალის საფუძველზე. ამ წერილში მოგვყავს დამატებითი გაზომვების შედეგები მზის კორონის განსაკუთრებულად არჩეულ წერტილებში—მის სხივებრ და არასხივებრ უბნებში. უკანასკნელთა მიმართ პოლარიზაციის ხარისხისა და სიბრტყის მიმართულების გამოკვლევას გარკვეული ინტერესი აქვს, დაკავშირებული კორონის სხივების ფორმისა და ფიზიკური ბუნების შესწავლასთან.

ცხრილი I შეიცავს პოლარიზაციის ხარისხის მნიშვნელობებს პროცენტებში ფოტოგრაფიული და ფოტოვიზუალური გამონასახისათვის, სხვადასხვა რადიუსისა და სხვადასხვა მანძილისათვის მზის კიდედან. პოლარიზაციის მაქსიმუმი მოდის მანძილზე $\rho = 12'$. სხივებრ ნაწილში პოლარიზაციის ხარისხი ცოტათი მეტია, ვიდრე არასხივებრ ნაწილში. თუმცა განსხვავება მათ შორის არც ისე მკვეთრია და გარკვეული.

ცხრილი II შეიცავს მონაცემებს პოლარიზაციის სიბრტყის მიმართულების შესახებ კორონის გამონასახისათვის ფოტოგრაფიულ სხივებში. ეს მონაცემები არ ამჟღავნებენ პოლარიზაციის სიბრტყის მიმართულების ბრუნვას.

შემოწმებული იყო სიკაშკაშის დაცემის კანონი, რომელიც გამოიხატება ფორმულით: $I = \frac{a}{h^n}$ სადაც h—კორონის მოცემული წერტილის დაშორებაა მზის კიდედან, a—მუდმივი, ხოლო n—სიკაშკაშის დაცემის კანონის გამომხატველი მაჩვენებელი. აღმოჩნდა, რომ n-ს პოლარიზებულ სხივებში უფრო დიდი მნიშვნელობა აქვს, ვიდრე არაპოლარიზებულ სხივებში.

იანვარი, 1944.